INFORMATION DIRECTORY

All inquiries and correspondence concerning the following areas should be addressed to:

**Admissions**
Office of Admissions
Tennessee Technological University
Box 5006
Cookeville, TN 38505-0001
(931) 372-3888 or 1-800-255-8881
Fax (931) 372-6250
admissions@tntech.edu

**Financial Aid**
Office of Financial Aid
Tennessee Technological University
Box 5076
Cookeville, TN 38505-0001
(931) 372-3073 or 1-800-268-0236
Fax (931) 372-6309
financialaid@tntech.edu

**Records and Registration**
Office of Records and Registration
Tennessee Technological University
Box 5026
Cookeville, TN 38505-0001
(931) 372-3317 or 1-800-268-0242
Fax (931) 372-6111
records@tntech.edu

**Residential Life**
Office of Residential Life
Tennessee Technological University
Box 5016
Cookeville, TN 38505-0001
(931) 372-3414 or 1-800-268-0240
Fax (931) 372-3772
reslife@tntech.edu

**Academic Offices**
Provost and Vice-President for Academic Affairs
(931) 372-3224
College of Agricultural & Human Sciences
(931) 372-3149
College of Arts & Sciences
(931) 372-3118
College of Business
(931) 372-3372
College of Education
(931) 372-3124
College of Engineering
(931) 372-3172
School of Interdisciplinary Studies
(931) 372-6238
Extended Programs and Regional Development
(931) 372-3394
Graduate Studies
(931) 372-3233
International Student Affairs
(931) 372-3634

Directory assistance for other offices is available through the main switchboard at (931) 372-3101. The University’s web site address is: www.tntech.edu.

Tennessee Technological University is a Tennessee Board of Regents institution. The Tennessee Board of Regents is the nation’s sixth largest higher education system, governing 45 post-secondary educational institutions. The TBR system includes six universities, 13 two-year colleges and 26 technology centers, providing programs to over 180,000 students in 90 of Tennessee’s 95 counties.
NOTICE

The course offerings and requirements of the institution are continually under examination and revision. This catalog (bulletin) presents the offerings and requirements in effect at the time of publication, but is no guarantee that they will not be changed or revoked. However, adequate and reasonable notice will be given to students affected by any changes. This catalog (bulletin) is not intended to state contractual terms and does not constitute a contract between the student and the institution.

The institution reserves the right to make changes as required in course offerings, curricula, academic policies, and other rules and regulations affecting students to be effective whenever determined by the institution. These changes will govern current and formerly enrolled students. Enrollment of all students is subject to these conditions.

Current information may be obtained from the following sources:

- Admission Requirements - Admissions Office
- Course Offerings - Department or Division Offering Course
- Degree Requirements - Departmental Chairperson of Major
- Fees and Tuition - Business Office

The University provides the opportunity for students to increase their knowledge by providing programs of instruction in the various disciplines and programs through faculty who, in the opinion of the University, are qualified for teaching at the college level. The acquisition and retention of knowledge by any student is, however, contingent upon the student's desire and ability to learn and his or her application of appropriate study techniques to any course or program. Thus, the University must necessarily limit representation of student preparedness in any field of study to that competency demonstrated at that specific point in time at which appropriate academic measurements were taken to certify course or program completion. Any or all students may be required to take one or more tests designed to measure general education achievement and/or achievement in selected major areas as a prerequisite to graduation for the purpose of evaluation of academic programs. Unless otherwise provided for any individual program, no minimum score or level of achievement is required for graduation. Participation in testing and other evaluation measures are required for all students and for students in selected programs. In order to comply fully with this provision, the student must authorize the release of his or her scores to the institution. Individual student scores will be treated as confidential. As reported by the Tennessee Higher Education Commission, the graduation rate at Tennessee Technological University is 51.5%.

Tennessee Technological University is an Equal Opportunity/Affirmative Action institution and is in compliance with Titles VI and VII of the Civil Rights Act of 1974, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1974, the Rehabilitation Act of 1973, the Vietnam Era Veterans Readjustment Act of 1974, and the Americans With Disabilities Act of 1990. The University is nondiscriminatory on the basis of age, race, color, religion, sex, national origin, disability status, or status as a disabled veteran or veteran of the Vietnam era. Inquiries or complaints concerning these policies should be directed to the Affirmative Action Officer, Derryberry Hall, Room 305, (931) 372-3016.

Faculty members will endeavor to make necessary accommodations for disabled persons in their courses. The Office of Disability Services is available to assist the faculty to make necessary special arrangements for disabled students. This Office should be contacted as early as possible by a student regarding assistance that may be needed for attendance at the University.

ACADEMIC POLICY RELATIVE TO CLOSING DUE TO INCLEMENT WEATHER

GENERAL STATEMENT: Tennessee Technological University offices will remain open during periods of inclement weather, even though classes may be canceled.

In accordance with TBR policy, faculty, administrators, and staff of TTU are expected to make every reasonable effort to be at their work assignment on time, taking into consideration the personal risk involved. Administrators or staff employees who anticipate arriving late, or not arriving at work at all, should notify their immediate supervisor of this fact as soon as possible and request annual leave for the period of absence. If faculty members must be absent from assigned classes due to inclement weather, it is their responsibility to notify the appropriate chairperson and/or dean.

If classes are not canceled despite inclement weather, students are responsible for any academic work they miss as a result of inclement weather. It is the individual student's responsibility to take the initiative in making up any missed work, and it is the faculty member's responsibility to provide students a reasonable opportunity to make up missed work.
Dear Student:

Congratulations and welcome to Tennessee Technological University. You have joined the company of an esteemed group – those who have chosen TTU to prepare them for success in their careers and in their life experiences. Our alumni hold positions as Fortune 500 CEOs, NASA astronauts, government leaders, renowned professors, and more.

As you will soon discover, all of our programs are of the highest quality and incorporate the latest technology throughout the curriculum. This will enable you to not only gain the skills you need when you graduate, but you’ll also learn how to keep learning, to appreciate all that life offers, and to apply what you learn in new situations. This places you among the most marketable of college graduates.

How do we know? Our students and alumni tell us so regularly on satisfaction surveys. And TTU is recognized nationally for its quality by several ranking organizations. We’re listed among “America’s 100 Best College Buys” for five consecutive years; ranked among the “Top Public Universities in the South” by U.S. News & World Report for nine of the last ten years, listed as a “Best Southeastern College” by The Princeton Review every year since 2005.

However, Tennessee Tech’s best qualities are found in its caring populace. The personal relationships that you develop here with your classmates and professors will last a lifetime. Our enrollment is an ideal size for you to receive the personal attention you need and the quality education that you deserve.

I am glad that you are here, and look forward to seeing you on campus.

Sincerely,

Robert R. Bell
President
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Tennessee Technological University

State University

Tennessee Technological University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097: Telephone number 404-679-4501) to award degrees at the associate's, bachelor's, master's, specialist, and doctoral levels.

Accreditation

National Council for Accreditation of Teacher Education
National Association of Schools of Music
The American Chemical Society
The American Dietetics Association
ABET, INC.
American Association of Family and Consumer Sciences
AACSB--International – The Association to Advance Collegiate Schools of Business
Association of Technology, Management, and Applied Engineering
Commission on Collegiate Nursing Education
National League for Nursing Accreditation Commission
National Association of Schools of Art and Design, Associate Member

Memberships

American Association of Colleges of Nursing
American Association of Colleges of Teacher Education
American Association of State Colleges and Universities
Council of Graduate Schools
Higher Education Unit – American Association of Family & Consumer Sciences
North American Colleges and Teachers of Agriculture
Ohio Valley Conference
Oak Ridge Associated Universities
Cookeville Area – Putnam County Chamber of Commerce
Southern Association of Colleges and Schools
Teacher Education Council of State Colleges and Universities
Tennessee College Association
University Calendar

This calendar is subject to change at any time prior to or during an academic term due to errors, emergencies, or causes beyond the reasonable control of the University.

Please see the University Calendar web site at www.tntech.edu/calendar for registration, fee payment, drop/add, and other important dates.

Summer Semester 2011

May 30 ................................................................. Memorial Day Holiday
June 6 .............................................................. Classes begin for First and Full Term
July 4 ............................................................... Independence Day Holiday
July 8 .............................................................. Final Examinations for First Term
July 11 ............................................................ Classes begin for Second Term
August 11-12 ................................................ Final Examinations for Second and Full Term

Fall Semester 2011

August 29 ............................................................. Classes begin
September 5 ..................................................... Labor Day Holiday-No classes
October 17-18 .................................................. Fall Break-No classes
November 24-25 ............................................. Thanksgiving Holidays-No classes
December 9 ..................................................... Last day of classes
December 12-15 ............................................. Final Examinations
December 17 .................................................... Commencement

Spring Semester 2012

January 12, ............................................................. Classes begin
January 16, .................................................... Martin Luther King Holiday-No classes
March 5-8, .......................................................... Spring Break
April 27, ............................................................. Last day of classes
April 30 - May 3, .............................................. Final Examinations
May 5, ............................................................... Commencement

Summer Semester 2012

May 28 ................................................................. Memorial Day Holiday
May 30 ............................................................. Classes begin for First and Full Term
June 29 .............................................................. Final Examinations for First Term
July 2 ............................................................... Classes begin for Second Term
July 4 .............................................................. Independence Day Holiday
August 2-3 ...................................................... Final Examinations for Second and Full Term
ESTABLISHMENT AND HISTORY

Tennessee Technological University was established by an act of the General Assembly in 1915 and opened its doors to students the following year. The University began operation on the campus which had belonged to Dixie College, a private institution founded in 1911. The purchase of the Dixie campus property and the erection of two dormitories, East and West Halls, were funded by Putnam County and the city of Cookeville. Since then, the growth of the institution has been closely interwoven with the development of the Upper Cumberland region.

From 1916 to 1924, Tennessee Polytechnic Institute offered work only on a high school and junior college level. By 1929, however, the Tennessee Board of Education had authorized a complete college program, and the first class of four-year graduates received their baccalaureate degrees in June.

In 1938 the instructional program was reorganized into two main divisions: the Arts and Sciences and the Professional and Technical Subjects. These divisions were renamed schools nine years later. In 1949, the administrative structure was expanded into five schools consisting of Arts and Sciences, Agriculture and Home Economics (now Agricultural and Human Sciences), Business Administration, Education, and Engineering. In 1950, the department of Military Science was added and in 1951 commissioned its first class of officers. The Graduate School program was authorized in 1958. The five undergraduate schools were designated as colleges in 1965, when Tennessee Polytechnic Institute gained university status and changed its name to Tennessee Technological University. In 1980, the School of Nursing began classes. In 2001, the School of Interdisciplinary Studies and Extended Education was established. In 2006, it was reorganized and renamed Extended Programs and Regional Development and the School of Interdisciplinary Studies. Since 1972, the University has been governed by the Tennessee Board of Regents.

STATEMENT OF MISSION

Tennessee Technological University’s mission as the state’s only technological university is to provide leadership and outstanding programs in engineering, the sciences, and related areas that benefit the people of Tennessee and the nation. The University also provides strong programs in the arts and sciences, business, education, agriculture and human ecology, nursing, music, art, and interdisciplinary studies. Tennessee Tech serves students from throughout the state, nation, and many other countries, but it retains a special commitment to enrich the lives of people and communities in the Upper Cumberland region of Tennessee.

The University is committed to the life-long success of students in its undergraduate, master’s, specialist, and doctoral degree granting programs through high-quality instruction and learning experiences. The University is engaged in scholarly activity, especially basic and applied research, creative endeavors, and public service, with special emphasis on community and economic development. The University supports student participation in a broad array of extracurricular activities as an integral component of its commitment to student life and success.

The University’s three interdisciplinary Accomplished Centers of Excellence in Energy Systems Research, Manufacturing, and Water Resources and Chairs of Excellence in Business Administration strengthen the instructional, research, and service mission of the University.

Tennessee Technological University provides educational opportunities to all eligible persons without regard to age, gender, ethnicity, race, religion, national origin, disability, or sexual orientation.

Tennessee Technological University is a member of the State University and Community College System of Tennessee and is governed by the Tennessee Board of Regents. Approved by the Tennessee Board of Regents on December 3, 2004.

VISION STATEMENT

TTU will be one of the best universities in the nation through a commitment to the life-long success of our students.

THE UNIVERSITY CAMPUS

Location. Cookeville, Tennessee, the site of Tennessee Technological University, is located on Interstate 40, Highway 70 North, and Highway 111. The city of Cookeville has a population of more than 26,000 and is located on the eastern Highland Rim of Tennessee at an elevation of 1,140 feet. The local public schools, civic clubs, and churches have a friendly and cooperative relationship with students, faculty, and staff. The surrounding area, enhanced by three major lakes,
Tennessee Technological University

abounds in natural beauty and is served by several state parks.

Campus. The campus consists of a tract of 235 acres made attractive by shrubbery, native trees, and a system of driveways and walks; the buildings are arranged to make a compact and convenient university plan.

Gerald D. Coorts Memorial Arboretum. Established on the campus by the Cookeville Tree Board and the College of Agriculture and Human Ecology (now Agricultural and Human Sciences). This tribute to former Agriculture and Home Economics Dean Gerald Coorts was officially dedicated on March 7, 1997. This lovely "garden" includes more than 150 trees, shrubs, and flowering plants located in areas behind South, Jere Whitson and Kittrell Halls.

Residential Life. The Office of Residential Life realizes the impact that living arrangements can create on a student’s life and education. We feel the decision to live in University housing, while attending college, will provide additional opportunities; for personal growth, educational development, connectedness, and leadership experiences. Studies consistently show that students living in the residence halls have higher grade point averages and lower dropout rates and are involved in more campus activities than those living at home or off campus.

TTU campus has 15 residence halls, two for men, one for women and 12 coeducational halls accommodating approximately 2,300 students. Each residence hall is supported by an Assistant Coordinator, a Hall Director, an experienced student staff member providing additional support to the hall, and between 9 and 12 Resident Assistants (RAs), upper class students hired to provide support, guidance and community development on each of the floors. Each residence hall is secured by entry through an electronic card access with only assigned residents and staff being allowed entrance.

Engineering Residence Halls—Maddux Hall and McCord Hall, both co-educational residence halls, are available for students majoring in any discipline within the College of Engineering. Contact the Basic Engineering Program for specific information.

Honors Residence Hall—Murphy Hall, a co-educational residence hall, is available for students majoring in the Honors program. Contact the Honors Department for specific information.

Business Residence Hall—Jobe Hall, a co-educational residence hall, is available for students majoring in any discipline within the College of Business. Contact the College of Business Student Success Center for specific information.

International Residence Hall—MS Cooper Hall, a co-educational residence hall, is available for International Students and students declaring majors in Foreign Languages and International Business and Cultures. Contact the Office of International Student Affairs for specific information.

Men’s Residence Halls. Tennessee Technological University has two residence halls housing approximately 265 male students. The names of the halls are: Browning and Evins.

Women’s Residence Halls. Tennessee Technological University has one residence hall housing approximately 235 female students. The name of the hall is: Crawford

Co-Ed Educational Residence Halls. Tennessee Technological University has twelve co-educational halls housing approximately 2000 students. Male and female residents are assigned on alternating floors. The names of the halls are:

Cooper Dunn Ellington Jobe McCord Maddux MS Cooper Murphy

New Hall North New Hall South Pinkerton Warf

Living-Learning Villages. The Village concept was conceived to create smaller, more personal groups within the larger university, to enhance student-faculty interaction beyond the classroom and to enhance positive student connections within the University. Each Village will be organized around a common theme and supported by a Faculty Head working together with the Assistant Coordinator, the Residential Life staff and the Village residents. Beginning fall 2010 our 1st 2 villages debuted; Environmental Village and Service Village, then with 2 additional villages each year thereafter; fall 2011 Engineering Village and Women’s Issues Village.

New Hall North “Treehouse” Environmental Village. A beautiful co-ed facility, newly opened fall 2010 - housing 238 co-ed residents. New Hall North offers both double and single rooms with private baths. Additional amenities include: a great room for residents to gather on each floor, laundry rooms on each of the upper floors, as well as three study rooms centrally located within the hall. Also housed in New Hall North is the Environmental Village, including the Faculty Head office. As a part of the “Treehouse” there are a number of activities and programs scheduled throughout the academic year supporting environmental issues and additional opportunities for interaction and connection to the campus community.

Attached to New Hall North is the sorority wing; housing chapter rooms for four campus sororities, “The Perch” (pizza and grill) and convenience store, a recreation area - both located on the first floor, as well as a multipurpose/classroom located on the second floor.

New Hall North is available to all students with selected rooms held for new, incoming freshman residents.

New Hall South “The Service Station” Service Village. The companion to New Hall North, housing 358 co-ed residents, offers double rooms with private bathrooms. Additional amenities include: an atrium
lounge that includes a large screen television and a ping pong table, four study rooms located throughout the hall as well as a multimedia classroom on the fourth floor. Also housed in New Hall South is the Service Village including the Faculty Head office. As a part of “The Service Station” there are a number of activities and programs scheduled throughout the academic year supporting service opportunities and additional chances for interaction and connection to the campus community. New Hall South is available to all students with selected rooms held for new, incoming freshman residents.

**Maddux/McCord Hall** Engineering Village. Maddux/McCord Hall is a traditional hall, housing 239 co-ed residents, that offers additional support for engineering students; 5 student engineering coordinators, hired especially to provide direct academic support for engineering students, as well as a computer lab specially equipped with engineering programs, as well as study lounges. Also housed in Maddux/McCord is the Faculty Head office for the Engineering Village. As a part of the Engineering Village there will be a number of activities and programs scheduled throughout the academic year geared towards students talking engineering classes.

**Crawford Hall** Women’s Village. A traditional hall located just across from the Nursing & Health Services Building, housing 219 women residents. In addition to the normal traditional hall amenities, also housed in Crawford Hall is the Faculty Head office, study rooms and a classroom for the Women’s Village. As a part of the Women’s Village program there will be a number of activities and events scheduled throughout the academic year selected to support women on a college campus.

**Specialty Housing.** In addition to our Living Learning Villages we also have 3 specialty housing areas: Honors Program located in Murphy Hall. Joe Hall provides support for business majors. M.S. Cooper Hall is our international hall as well as our hall utilized for break periods. In specialty housing, the Residential Life staff along with program mentors will provide opportunities for students to assist one another, both academically and personally. Activities include faculty involvement programs, study groups, technology resources and academic support programs.

**Tech Village.** There are 300 Tech Village apartments for the following student groups; juniors, seniors, 21 years or older, married, single with children, graduate, and faculty/staff. Beginning fall 2011 the 1st phase of our apartment renovation project will be completed (all apartments will be totally renovated at about 100 apartments per year).

**Athletic Fields.** Overall Field, home to the Tennessee Tech Golden Eagles Football team, is covered with artificial turf, and has an eight-lane artificial track. Tucker Stadium seats 16,500 spectators. The east stadium section houses facilities for the football team and instructional laboratories. The west stadium section contains classrooms, laboratories, rifle range, and offices for the Army R.O.T.C. program. Other fields include Quillen Field (the intercollegiate baseball field), the Ray Drost Intramural Fields, and lighted tennis courts.

**Academic and Service Facilities.** The following facilities serve either as academic buildings or as service buildings for the educational programs of the University:

- **Bartoo Hall** houses a Learning Resources Center, Curriculum and Instruction Department, Educational Support Services, and computer labs.
- **Brown Hall** houses the Departments of Electrical and Computer Engineering, Mechanical Engineering, and the Manufacturing Center.
- **Bruner Hall** houses the Departments of Computer Science, Mathematics, and Physics.
- **Bryan Fine Arts Building** houses the Department of Music and Art and the James A. Wattenbarger Auditorium.
- **Clement Hall** houses the Office of the Dean of the College of Engineering, the Basic Engineering Program, and the D.W. Mattson Computer Center.
- **Mattie Sue Cooper Residence Hall** houses the Office of Residential Life as well as students assigned to the building.
- **Daniel and Matthews Halls** house the Academic Development Program, Department of Sociology and Political Science, the Child Development Laboratory, the Special Education Program, Counseling and Psychology, and a number of model demonstration programs in education.
- **Derryberry Hall** houses the central administration offices, Concert Hall (an auditorium with 828 seats), Admissions Office, Offices of Records and Registration, University Development, University Advancement, and Graduate School.
- **Joe L. Evins Appalachian Center for Craft** located on Center Hill Lake near Smithville houses 87,000 sq. ft. of facilities including the Office of the Director of the Craft Center, classrooms, studios, a library, conference rooms, exhibition and sales galleries, a café, and residential quarters for 64 students.
- **Hooper Eblen Center** houses the offices of the intercollegiate athletics program, the Eagle’s Nest (an alumni-sponsored lounge and meeting room), and the center for varsity basketball games, convocations, concerts, and conferences. The seating capacity of this facility is 10,200.
- **Hyder-Burks Agricultural Pavilion** is utilized during the week to support instruction in the School of Agriculture and is located at Shipley Farm. Phase I has over 4,000 sq. ft. for animal holding facilities and a sales/demonstration arena. Phase II has a standard
show arena and seating for over 2,000. It has office space, classrooms, and laboratory facilities.

The W. Clyde and Marie Hyder Farm contains thirty-one acres and is used as grazing acreage by livestock herds. The farm is operated by the School of Agriculture.

Foster Hall houses the Department of Chemistry.

Foundry Building houses Industrial Technology metal casting.

Henderson Hall houses the Office of the Dean of the College of Arts and Sciences, the College of Arts and Sciences Student Success Center (GECU), the Departments of English and Communications and History, the School of Interdisciplinary Studies, and Extended Programs and Regional Development.

Indoor Tennis Building houses two tennis courts.

Jere Whitson Building houses the Alumni Center, the Backdoor Playhouse and offices, laboratories and classrooms for the College of Agricultural and Human Sciences, the Upper Cumberland Child Care Resource and Referral Center, and the Tennessee Early Childhood Technical Alliance Office.

Johnson Hall houses the Office of the Dean of the College of Business, the Departments of Accounting; Decision Sciences and Management; Economics, Finance, and Marketing, the MBA program, two computing and technology resource centers, all multimedia classrooms, and an auditorium with 150 seats.

Kittrell Hall houses the Department of Earth Sciences.

Lewis Hall houses the offices and instructional laboratories for the Department of Manufacturing and Industrial Technology.

Angelo and Jennette Volpe Library and Media Center houses the print and multimedia collections. The Library is a selective U.S. Federal Depository. Access to the Library's holdings is provided by an online catalog accessible through the campus network. The Library provides information sources in a variety of electronic formats. The Library participates in regional and national bibliographic networks which provide extensive resource sharing capability. The collections are now over two million titles.

Memorial Health and Physical Education Building houses offices, classrooms, apparatus rooms, handball courts, swimming pool, and two intramural gymnasiums. A large gymnasium which has a seating capacity of 3,262 is also located in this building.

Old Infirmary Building houses University Police and Telecommunications.

Old Maintenance Building houses the Agricultural Engineering Technology Laboratory and College of Engineering Research Laboratories.

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Nursing and Health Services Building houses the offices, classrooms, and clinical simulation laboratories for the School of Nursing.

Pennebaker Hall houses the Biology Department, Cooperative Fisheries Unit, Women's Center, and Art Education.

Facilities and Business Services Buildings house offices, shops, and storage space for operation and maintenance of the University's physical plant.

Ray Morris Hall houses the Millard Oakley STEM Center for the Teaching and Learning of Science, Technology, Engineering and Mathematics. The Oakley STEM Center includes administrative offices and interview rooms, learning studios and prep lab, 240-seat auditorium, virtual theatre, food service, and multipurpose lobby space.

Prescott Hall houses the Departments of Civil and Environmental, Chemical, and Industrial and Systems Engineering; the Water Resources Center; and the Energy Systems Research Center. Also located in the building is an auditorium with a seating capacity of 401.

Recreation and Fitness Center is a facility of approximately 80,000 square feet which houses spaces for physical activity and recreation, including a natatorium. The construction and operation costs for this facility are funded entirely by student fees.

The Shipley Farm, which serves as a farm laboratory, contains three hundred acres and is located two miles from the main campus. It is used for demonstration, instruction, and research, and is operated by the College of Agricultural and Human Sciences Programs.

South Hall houses the School of Agriculture, and the School of Human Ecology, including the School's Historical Textiles Collection and Friday Cafe. In addition, it houses the Department of Foreign Languages.

T. J. Farr Education Building houses the Office of the Dean, Associate Dean, Assistant Dean and the Advisement Center of the College of Education, the Rural Education Research and Services Consortium, the Office of the Ph.D. in Exceptional Learning, and Offices of the Honors Program.

Roaden University Center Building houses the central dining rooms including a cafeteria and a grill; Post Office; Bookstore; Mini-Market; student and faculty conference rooms; Joan Derryberry Art Gallery; Student Government Association Offices; student publication offices; Public Affairs Office for news, publications, and sports information; Career Services; Counseling Center; WTTU-FM; offices and conference rooms for student personnel services; Office of Financial Aid; Office of Student Activities and Campus Life; Office of Student Affairs; Dean of Students Office, Office of Disability Services, Office of Minority Affairs and Orientation and Student Success Office.
University Services Building houses the Heating Plant and Printing Shop.

Walton House. The president's residence is located near Old Walton Road and historic Dixie Avenue. The Old Walton Road is a part of the route traveled between Washington, D.C., and The Hermitage by the Seventh President of the United States, Andrew Jackson.
### School of Agriculture

**Undergraduate Degree Programs**

<table>
<thead>
<tr>
<th>Department</th>
<th>Major</th>
<th>Concentrations Within Major</th>
<th>Degree</th>
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<td>Agriculture</td>
<td>1. Agribusiness Management</td>
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<td>2. Agricultural Communications</td>
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<td>3. Agricultural Education</td>
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<td>4. Agricultural Engineering Technology</td>
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<td>5. Agritourism</td>
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<td>6. Agronomy &amp; Soils</td>
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<td></td>
<td>7. Animal &amp; Pre-Veterinary Science</td>
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<td></td>
<td></td>
<td>a. Animal Science</td>
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<td>b. Pre-Veterinary Science</td>
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<td>8. Environmental Agriscience</td>
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<td>9. Horticulture</td>
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<td>10. Nursery &amp; Landscape Management</td>
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<td>11. Turfgrass Management</td>
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### School of Human Ecology

**Undergraduate Degree Programs**

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<tr>
<td>Human Ecology</td>
<td>Human Ecology</td>
<td>1. Child Development &amp; Family Relations (Non-Licensure)</td>
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<tr>
<td></td>
<td></td>
<td>a. Child Life</td>
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<td></td>
<td>2. Family &amp; Consumer Sciences Education</td>
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<td>3. Food, Nutrition &amp; Dietetics</td>
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<td></td>
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<td>a. Dietetics Option</td>
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<td>b. Food Systems Administration Option</td>
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<td>4. Housing &amp; Design</td>
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<td>5. Merchandising &amp; Design</td>
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### School of Nursing

**Graduate Degree Program**

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**Undergraduate Degree Program**

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## College of Arts and Sciences

### Undergraduate Degree Programs

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<td>2. Cellular &amp; Molecular Biology</td>
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<td>3. Environmental Biology</td>
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<td>4. Health Sciences</td>
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<tr>
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<td>Wildlife &amp; Fisheries Science</td>
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<td>2. Fisheries Science</td>
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<td>3. Conservation Biology</td>
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<tr>
<td>Chemistry</td>
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<td>1. Pure Chemistry</td>
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<td>2. Biochemistry</td>
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<td>3. Applied Chemistry</td>
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<td></td>
<td></td>
<td>a. Business Chemistry</td>
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<td>b. Environmental Chemistry</td>
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<td>c. Forensic Chemistry</td>
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<td>d. Health Sciences</td>
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<td>e. Industrial Chemistry</td>
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<td>f. Chemistry</td>
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<td>Earth Sciences</td>
<td>Geosciences</td>
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<td>2. Geographical Information Systems</td>
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<td>English &amp; Communications</td>
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<td>3. Professional Communication</td>
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<td>4. Writing/Language/Genre</td>
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<td>a. News Editorial</td>
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<td>b. Public Relations</td>
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<td>2. Speech Communication</td>
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<tr>
<td>History</td>
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<td>Mathematics</td>
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<td>Bachelor of Science</td>
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<tr>
<td>Physics</td>
<td>Physics</td>
<td>1. Traditional Physics</td>
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<tr>
<td></td>
<td></td>
<td>2. Applied Physics</td>
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<tr>
<td>Major</td>
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<tr>
<td>Biology</td>
<td>1. General</td>
<td>Master of Science</td>
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<tr>
<td>Practical Fishery Management</td>
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<tr>
<td>Biology</td>
<td>2. Fisheries Management</td>
<td>Master of Science</td>
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</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td>Master of Science</td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>1. Internet-based Computing</td>
<td>Master of Science</td>
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</tr>
<tr>
<td>English &amp; Communications</td>
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<td>Master of Arts</td>
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</tr>
<tr>
<td>Mathematics</td>
<td>1. Applied Mathematics</td>
<td>Master of Science</td>
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<td>Mathematics</td>
<td>2. Mathematics</td>
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<tr>
<td>Interdepartmental Sciences</td>
<td>1. Biology</td>
<td>Doctor of Philosophy</td>
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<tr>
<td>Interdepartmental Sciences</td>
<td>2. Chemistry</td>
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</table>

**College of Business**

**Undergraduate Degree Programs**

<table>
<thead>
<tr>
<th>Department</th>
<th>Major</th>
<th>Concentrations Within Major</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>Accounting</td>
<td></td>
<td>Bachelor of Science in Business Administration</td>
</tr>
</tbody>
</table>

*Administered by the College of Arts and Sciences and the College of Business
**Administered in the College of Education
### College of Business

**Graduate Degree Programs**

<table>
<thead>
<tr>
<th>Department</th>
<th>Major</th>
<th>Concentrations Within Major</th>
<th>Degree</th>
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### College of Education

**Undergraduate Degree Programs**

<table>
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<tr>
<th>Department</th>
<th>Major</th>
<th>Concentrations Within Major</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling &amp; Psychology</td>
<td>Psychology</td>
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<td>Bachelor of Science</td>
</tr>
<tr>
<td>Curriculum &amp; Instruction</td>
<td>Child &amp; Family Studies</td>
<td>1. Early Childhood Education/Special Education</td>
<td>Bachelor of Science</td>
</tr>
<tr>
<td></td>
<td>Multi-disciplinary Studies</td>
<td>1. Elementary Education (K-6) 2. Teaching English as a Second Language (PreK-12) 3. General (Non-Licensure) 4. Middle School (4-8)</td>
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<tr>
<td>Subject</td>
<td>Options</td>
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<tr>
<td>Special Education</td>
<td>1. Modified (K-12), 2. Comprehensive (K-12)</td>
<td>Bachelor of Science</td>
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</tr>
<tr>
<td>Exercise Science, Physical Education and Wellness</td>
<td>1. Athletic Training, 2. Coaching and Sport Administration, 3. Licensure (K-12), 4. Fitness and Wellness, 5. Pre-occupational Therapy, 6. Pre-physical Therapy</td>
<td>Bachelor of Science Education</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>1. Family &amp; Consumer Sciences Education (a. Child Care Services, b. Food Services, c. Fashion &amp; Fabric Services)</td>
<td>Bachelor of Science in Human Ecology</td>
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</tr>
<tr>
<td>Human Ecology</td>
<td>1. Family &amp; Consumer Sciences Education (a. Child Care Services, b. Food Services, c. Fashion &amp; Fabric Services)</td>
<td>Bachelor of Science in Human Ecology</td>
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</table>
### College of Education

#### Graduate Degree Programs

<table>
<thead>
<tr>
<th>Department</th>
<th>Major</th>
<th>Options Within Major</th>
<th>Degree</th>
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</thead>
</table>
| Counseling & Psychology             | Educational Psychology & Counselor Education | 1. Agency Counselor  
2. Educational Psychology  
3. Mental Health Counseling  
4. School Counselor  
5. School Psychology | Master of Arts  
Specialist in Education |
2. Early Childhood Education  
3. Elementary Education  
4. Library Science  
5. Reading  
6. Secondary Education  
7. Special Education | Master of Education |
| Instructional Leadership            |                                     | 1. Applied Behavior & Learning  
2. Literacy  
3. Programming Planning and Evaluation | Master of Arts  
Specialist in Education |
| Exceptional Learning                |                                     | 1. Adapted Physical Education  
2. Elementary/Middle School Physical Education  
3. Lifetime Wellness | Doctor of Philosophy |
| Exercise Science, Physical Education and Wellness | Health & Physical Education | 1. Adapted Physical Education  
2. Elementary/Middle School Physical Education  
3. Lifetime Wellness | Master of Arts |

### College of Engineering

#### Undergraduate Degree Programs

<table>
<thead>
<tr>
<th>Department</th>
<th>Major</th>
<th>Options Within Major</th>
<th>Degree</th>
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</thead>
</table>
| Chemical Engineering                | Chemical Engineering                | 1. Bio-Molecular Engineering Concentration  
2. No Concentration | Bachelor of Science in Chemical Engineering |
| Civil & Environmental Engineering   | Civil Engineering                  | 1. Environmental Engineering  
2. Structural Engineering  
3. Structural Mechanics  
4. Transportation Engineering | Bachelor of Science in Civil Engineering |
| Computer Science                    | Computer Science                    | 1. Information Technology  
2. Software & Scientific Applications | Bachelor of Science in Computer Engineering |
| Electrical & Computer Engineering   | Computer Engineering               |                                               | Bachelor of Science in Computer Engineering |
## College of Engineering

### Graduate Degree Programs

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<th>Options Within Major</th>
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<td>1. Environmental Engineering</td>
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<tr>
<td>Civil &amp; Environmental Engineering</td>
<td>Civil Engineering</td>
<td>1. Environmental Engineering</td>
<td>Master of Science</td>
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<td>2. Structural Engineering</td>
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<td>3. Transportation Engineering</td>
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<td>Electrical &amp; Computer Engineering</td>
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<td>2. Computers &amp; Digital Systems</td>
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<td>3. Electromagnetic Fields &amp; Physical Electronics</td>
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<td>4. Networks &amp; Control Systems</td>
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<td>5. Nuclear Systems</td>
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<td>6. Power Systems &amp; Energy Conversion</td>
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<td>Mechanical Engineering</td>
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<td>2. Control Systems</td>
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<td>3. Design/Mechanical Systems</td>
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<td>4. Thermal Science/Systems</td>
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<td>5. Materials</td>
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<td>Individual Programs</td>
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<th>Concentrations Within Major</th>
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<td>Professional Studies</td>
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<td>2. Information Technology</td>
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<td></td>
<td>3. International Organizational Leadership</td>
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<td>4. Organizational Leadership</td>
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### Graduate Degree Program

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<td>2. Strategic Leadership</td>
<td>Studies</td>
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<td></td>
<td></td>
<td>3. Training and Development</td>
<td></td>
</tr>
</tbody>
</table>

### PRE-PROFESSIONAL PROGRAMS

Pre-professional programs are designed to satisfy minimum requirements for admission to professional schools. Some students complete only these minimum course requirements prior to seeking admission to the professional school; some students enroll in degree programs such as agriculture, biology, chemistry, engineering, physics, or others, and also take courses to complete the minimum professional school requirements because many of the courses satisfy requirements in both programs. In the case of pre-law, there is no specific degree required; therefore, students interested in law usually pursue a bachelor's degree in a field of their interest such as history, political science, or some area of business.

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Duration</th>
<th>Program Name</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Dental Hygiene</td>
<td>2 years</td>
<td>Pre-Occupational Therapy</td>
<td>2 years</td>
</tr>
<tr>
<td>Pre-Dentistry</td>
<td>3 years</td>
<td>Pre-Optometry</td>
<td>3 years</td>
</tr>
<tr>
<td>Pre-Health Information Management</td>
<td>3 years</td>
<td>Pre-Pharmacy</td>
<td>2 years</td>
</tr>
<tr>
<td>Pre-Medical Technology</td>
<td>2 years</td>
<td>Pre-Physical Therapy</td>
<td>3 years</td>
</tr>
<tr>
<td>Pre-Medicine</td>
<td>3 years</td>
<td>Pre-Veterinary Medicine</td>
<td>4 years</td>
</tr>
</tbody>
</table>

(Other programs in the allied sciences are available.)

Military Science is available as a minor.
Concentrations in undergraduate programs of study are listed on the transcript.
Options in undergraduate programs of study are not listed on the transcript.
Admission policies and practices of the University are intended to assist students of varied backgrounds to gain admission. Race, color, creed, sex, or disabling conditions have no bearing upon admission to the University. The University actively seeks students of diversity due to a lack of critical mass of these unrepresented groups and encourages them to apply for admission and to inquire about programs. Admission standards are designed to assure the student of the best possibility of success in college.

Prompt attention is given to each application but final action is not possible until all credentials are on file with the University. Students are advised to submit their applications during the fall or winter for admission for the following fall, or three months in advance for spring or summer admission. The application deadline date for receipt of the admission application, test scores (ACT/SAT) and appropriate transcripts is August 1 for fall entry, December 1 for spring entry, and May 1 for summer entry.

Upon acceptance, a student must complete health requirements prior to registering for classes. The University reserves the right to modify admission policies and procedures as needed to ensure that enrollment does not exceed the facilities available.

Correspondence regarding admission should be addressed to the Office of Admissions, Box 5006, Tennessee Technological University, Cookeville, Tennessee 38505. The website for Admissions is www.tntech.edu/admissions. The e-mail address is admissions@tntech.edu.

ADMISSION TO FRESHMAN STANDING

An applicant who has no previous college enrollment following high school graduation or receiving a GED may be considered for admission as a regular undergraduate freshman. To become a freshman student of the University, one must meet the following requirements:

1. Be at least 16 years of age.
2. Present a signed health history including current immunization history.
3. a. Public School – Graduates of public high schools must provide an official high school transcript showing credits earned and date of graduation. The transcript should include ACT or SAT scores, if applicable. Although a student may receive tentative admission based on grades received through the sixth or seventh semester, a final high school transcript showing graduation and satisfactory grades must be received by the Office of Admissions prior to actual enrollment.
   b. Non-Public School – Graduates of non-public high schools (including private schools, home schools, and church-related schools) must submit an official transcript showing credits earned and date of graduation. The transcript of a home school applicant must be an official copy from an affiliated organization as defined by state law (T.C.A. 49-50-801) or be accompanied by certification of registration with the superintendent of the local education agency which the student would otherwise attend. Although a student may receive tentative admission based on grades received through the sixth or seventh semester, a final high school transcript showing graduation and satisfactory grades must be received by the Office of Admissions prior to actual enrollment. Applicants who cannot provide a satisfactory secondary school credential may substitute acceptable scores on the GED examination (see Admission by Examination).

4. Core High School Curriculum/Academic Units: All students who have graduated from high school since 1989 must have completed a high school curriculum that includes as a minimum the following 14 academic credits:

<table>
<thead>
<tr>
<th>Subject Area:</th>
<th>Required Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>4</td>
</tr>
<tr>
<td>Visual and/or Performing Arts, including a survey course or participation in one or more of the arts (music, dance, theatre, visual arts)</td>
<td>1</td>
</tr>
<tr>
<td>Algebra I and II</td>
<td>2</td>
</tr>
<tr>
<td>Geometry or other advanced math course with Geometry as a major component</td>
<td>1</td>
</tr>
<tr>
<td>Natural/Physical Sciences, including at least one unit with lab, of biology, chemistry, or physics</td>
<td>2</td>
</tr>
<tr>
<td>Social Studies. This unit must be either World History, Ancient History, Modern History, World Geography, or European History</td>
<td>1</td>
</tr>
<tr>
<td>United States History</td>
<td>1</td>
</tr>
<tr>
<td>A single Foreign Language</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Students with more than 2 deficiencies will not be admitted, except under extreme AND unusual circumstances. Students lacking in any of the subject areas above should correspond with the Office of Admissions regarding methods to remove any deficiencies. A student admitted with any deficiencies must remove the deficiencies prior to completing 60 degree credits or 30 university credits if one is a transfer student. See “Removal of Admissions Deficiencies”.

5. New freshmen applicants must fall into one
6. **Placement Tests:** The University currently uses ACT/SAT scores and the COMPASS exam to place students in appropriate level courses. The following students may be required to take the COMPASS exam:

- 19 ACT Composite* AND 2.0 High School GPA AND 12 of 14 Academic Units
- **OR**

- 17 ACT Composite** AND 2.5 High School GPA AND 12 of 14 Academic Units

* Or SAT Critical Reading and Math score of 900
** Or SAT Critical Reading and Math score of 820

Students who have less than a 2.00 high school GPA or less than a 17 ACT Composite score will be reviewed by the Admissions Review Committee. Students who have lower than 15 ACT English, math, or reading subscore will not be admitted, regardless of GPA. An exception to this policy will be allowed for students who score sufficiently on the COMPASS exam to place out of remedial courses.

Engineering majors must have a high school GPA of 2.35, an ACT composite score of 20 and an ACT mathematics score of 20. Mathematics majors and computer science majors must have an ACT mathematics score of 21 in addition to requirements for admission to the University.

Nursing majors must have a high school GPA of 3.0 and an ACT composite score of 20. Students who wish to major in certain Pre-Professional majors* must have a high school GPA of 3.0, a minimum ACT composite score of 21 and a minimum ACT mathematics score of 21. Students who do not meet these requirements for entering Nursing or Pre-Professional majors*, but do meet general admission requirements, may be admitted into the General Health Studies program.

*Pre-Professional majors that have different requirements other than general admission requirements include: Pre-Medicine, Pre-Dentistry, Pre-Pharmacy, Pre-Optometry, Pre-Medical Technology, Pre-Physical Therapy, Pre-Occupational Therapy, Pre-Dental Hygiene and Pre-Health Information Management.

6. **Placement Tests:** The University currently uses ACT/SAT scores and the COMPASS exam to place students in appropriate level courses. The following students may be required to take the COMPASS exam:

1. Students who have less than a 19 ACT English, Math, or Reading score;
2. Students with deficiencies in high school English or Math;
3. New students over the age of 21;
4. Students entering with a GED. Based upon ACT scores and test scores from the COMPASS, students may be required to enroll in one or more classes at the developmental level (see Learning Support Program). For more information on the COMPASS exam, go to www.tntech.edu/learningsupport.

7. University 1020 or equivalent, a course designed to improve academic success, is required for all students. Check with your academic advisor for more information.

All applications from students whose native language is not English will be screened by the English Placement Committee and such students may be required to take a placement test at Tennessee Tech for the purpose of validating previous English study and/or placement in English courses, including English composition and English as a Second Language. The English placement test may not be taken more than once.

Applicants for admission to freshman standing who have been enrolled at another college or university must have transcripts which bear the seal of each institution attended sent directly from that college or university (see Admission as a Transfer Student).

**APPLICATION PROCEDURE FOR FRESHMEN**

1. Complete the online application for Undergraduate Freshman students at www.tntech.edu/applyonline. (A copy of the paper application can be downloaded from www.tntech.edu/admissions/forms.) Applications must be completed and submitted to the Office of Admissions at an early date. Applications must be accompanied by a non-refundable fee of $25.

2. To be considered during the senior year of high school, a student should request the high school counseling office to forward a transcript of the high school record complete through grade eleven (showing six graded semesters) to Tennessee Tech. A final transcript should be forwarded upon graduation. If a student received a GED in lieu of high school graduation, an official transcript of the GED is required. If a student has completed any college credit (through dual-enrollment, summer courses, etc.) at any institution of higher education, an official college transcript should be sent to Tennessee Tech from that institution. Please note: Transcripts that are marked “Issued to Student,” addressed to the student or faxed are not considered official for admission purposes.

It is a Class A misdemeanor to misrepresent academic credentials. A person commits the offense of misrepresentation of academic credentials who, knowing that the statement is false and with the intent to secure employment at or admission to an institution of higher education in Tennessee, represents, orally or in writing that such person:

1. Has successfully completed the required course work for and has been awarded one (1) or more degrees or diplomas from an accredited institution of higher education;
2. Has successfully completed the required course work for and has been awarded one (1) or more
degrees for diplomas from a particular institution of higher education; or
3. Has successfully completed the required course work for and has been awarded one (1) or more degrees or diplomas in a particular field or specialty from an accredited institution of higher education.
4. Each applicant should make arrangements with the school counselor to take the American College Test (ACT) or the Scholastic Aptitude Test of the College Entrance Examination Board (SAT). At the time the test is taken, one should request that the scores be sent to Tennessee Technological University.
5. Reservations for on-campus housing should be obtained by submitting an application and prepayment to the Office of Residential Life. (See Residential Life.)
6. Complete and return the Student Health Form and Hepatitis/Meningitis Wavier form before registering for classes. Forms are available to download from the Health Services website at www.tntech.edu/healthservices. (See “Health Requirements” section for more information.)
7. Upon acceptance, students will be mailed a letter of Admission. Information concerning orientation and registration will be provided to students admitted prior to registration.

REMOVAL OF ADMISSIONS DEFICIENCIES

The Tennessee Board of Regents requires the completion of specific high school courses in six (6) areas: The arts, English, foreign language, mathematics, science, and social studies. Students admitted to Tennessee Technological University with admissions deficiencies will be required to remove these deficiencies by the time the student has earned 60 credit hours. Students who graduated from an accredited high school subsequent to 1989 must meet the 14 required units of academic credit.

Students who received a GED certificate in 1989-1992 are considered to have met all high school requirements except those in foreign language. Students who earned a GED certificate in 1993 and thereafter are considered to have met all high school unit requirements except those in foreign language and visual or performing arts. Students who received a GED prior to 1989 will be evaluated by GED scores only. The COMPASS test will also be required.

Deficiencies in English or Algebra:
Students with admissions deficiencies in English are required to take DSPW 0800*. Students with admissions deficiencies in Algebra would be required to take DSPM 0800* and/or DSPM 0850*.

*Credit hours earned in Learning Support Program courses (LSP courses) do not count toward graduation.

Deficiencies in social studies, history, visual/performing arts, science and geometry/advanced mathematics:
Deficiencies in one or more of these areas can be removed by completing the appropriate subject category in the General Education Core Curriculum. The hours earned in the corresponding course are used to remove the deficiency(ies) as well as meet degree requirements as outlined in the student’s academic program. Students should contact their academic advisor for more information about removing any admissions deficiencies.

ADVANCED PLACEMENT WITH CREDIT

Entering students and regularly enrolled students may obtain advanced placement with credit in certain courses by obtaining high scores on the appropriate test(s):

| ACT English Subtest score of 27-30 | ENGL 1010 |
| SAT Critical Reading Subtest score of 610-690 | ENGL 1010 |
| ACT English Subtest score of 31 or higher | ENGL 1010 and ENGL 1020 |
Tennessee Technological University  2011-12 Undergraduate Catalog

SAT Critical Reading Subtest score of 700 or higher  
ENGL 1010 and ENGL 1020

The ACT code for Tennessee Tech is 4012. The SAT code is 1804.

CEEB POLICY FOR TTU  
Effective April 1, 2011

<table>
<thead>
<tr>
<th>A.P. Examination</th>
<th>Score</th>
<th>Course Exemption</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>4</td>
<td>BIOL 1010 or BIOL 1110</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>BIOL 1010 &amp; BIOL 1020 or BIOL 1110 &amp; BIOL 1120</td>
<td>8</td>
</tr>
<tr>
<td>Calculus (AB)</td>
<td>3</td>
<td>MATH 1830</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>MATH 1910</td>
<td>4</td>
</tr>
<tr>
<td>Calculus (BC)</td>
<td>3</td>
<td>MATH 1910</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>MATH 1910 &amp; MATH 1920</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry</td>
<td>4 *</td>
<td>CHEM 1110 or CHEM 1010 &amp; CHEM 1020</td>
<td>4 8</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>CHEM 1110 &amp; CHEM 1120 or CHEM 1010 &amp; CHEM 1020</td>
<td>8</td>
</tr>
<tr>
<td>Economics: Micro</td>
<td>4 or 5</td>
<td>ECON 2010</td>
<td>3</td>
</tr>
<tr>
<td>Economics: Macro</td>
<td>4 or 5</td>
<td>ECON 2020</td>
<td>3</td>
</tr>
<tr>
<td>English Language and Composition</td>
<td>4</td>
<td>ENGL 1010</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>ENGL 1010 &amp; ENGL 1020</td>
<td>6</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>4 or 5</td>
<td>BIOL 3130</td>
<td>4</td>
</tr>
<tr>
<td>English Literature and Composition</td>
<td>4</td>
<td>ENGL 2330</td>
<td>3</td>
</tr>
<tr>
<td>European History</td>
<td>4 or 5</td>
<td>HIST 1010 &amp; HIST 1020</td>
<td>6</td>
</tr>
<tr>
<td>French Language</td>
<td>3</td>
<td>FREN 1010 &amp; FREN 1020</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4 or 5</td>
<td>FREN 1010, FREN 1020, FREN 2010 &amp; FREN 2020</td>
<td>12</td>
</tr>
<tr>
<td>German Language</td>
<td>3</td>
<td>GERM 1010 &amp; GERM 1020</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4 or 5</td>
<td>GERM 1010, GERM 1020, GERM 2010 &amp; GERM 2020</td>
<td>12</td>
</tr>
<tr>
<td>Government and Politics: United States</td>
<td>4 or 5</td>
<td>POLS 1000</td>
<td>3</td>
</tr>
<tr>
<td>Human Geography</td>
<td>3</td>
<td>GEOG 1120</td>
<td>3</td>
</tr>
<tr>
<td>Spanish Language</td>
<td>3</td>
<td>SPAN 1010 &amp; SPAN 1020</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4 or 5</td>
<td>SPAN 1010, SPAN 1020, SPAN 2010 &amp; SPAN 2020</td>
<td>12</td>
</tr>
<tr>
<td>Statistics</td>
<td>4 or 5</td>
<td>MATH 1530</td>
<td>3</td>
</tr>
<tr>
<td>Physics B</td>
<td>4 or 5</td>
<td>PHYS 2010 &amp; PHYS 2020</td>
<td>8</td>
</tr>
<tr>
<td>Physics C: Mechanics</td>
<td>3</td>
<td>PHYS 2010</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4 or 5</td>
<td>PHYS 2010 or PHYS 2110</td>
<td>4 or 3</td>
</tr>
<tr>
<td>Physics C: Electricity and Magnetism</td>
<td>3</td>
<td>PHYS 2020</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4 or 5</td>
<td>PHYS 2010 or PHYS 2120</td>
<td>4 or 3</td>
</tr>
<tr>
<td>Psychology</td>
<td>4</td>
<td>PSY 2010</td>
<td>3</td>
</tr>
</tbody>
</table>
Students may submit the exam essay portion for departmental evaluation for possible credit in CHEM 1120.

CLEP (College Level Examination Program) - 25 subject matter tests from which to select - credit given in corresponding courses for acceptable scores. Credit is not given for the general examinations. For further information, contact the Admissions Office.

PLTW (Project Lead the Way Credit) – ENGR 1210 (1 credit hour) will be awarded to secondary school students who participate in the “Project Lead the Way” and achieve a minimum grade 70% on the nationalized “Final Exam on Principles of Engineering”. The requesting student will need to have his/her test score sent to Tech.

Credit by Examinations - A student who has had sufficient training or experience in a subject to merit the establishment of credit by comprehensive examination, but who has not enrolled in the same, comparable, or higher level course at the college level, may request the privilege of taking a special examination prepared by the department involved. A grade will be recorded on the permanent record.

Non-credit Courses and Professional Certification – Academic credit may be awarded on occasion for professional certification or non-credit courses. Requests for the award of such credit must be submitted to the appropriate department chairpersons. As the executor of departmental policy, he or she will evaluate the requests and submit a recommendation to accept or reject them to the college dean and Office of Records for final approval.

The ACT code for Tennessee Tech is No. 4012. The SAT code is No. 1804.

Credit obtained through high test scores on ACT, SAT, CLEP and PLTW receive the grade of “S” for satisfactory and do not affect the student’s quality point average. Up to 33 semester hours of credit may be obtained through any combination of advanced placement tests, military equivalency credits, correspondence courses, special departmental examinations, and extension courses. For more detailed information, contact the Office of Admissions or your high school counselor.

**INTERNATIONAL BACCALAUREATE**

The University recognizes the International Baccalaureate diploma and individual IB courses by awarding credit on IB higher level examinations. Some standard level examinations may also be considered for credit.

<table>
<thead>
<tr>
<th>International Baccalaureate Course</th>
<th>Minimum Required Score</th>
<th>TTU Equivalent</th>
<th>Credit Hours Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art A (SL)</td>
<td>4</td>
<td>Art Studio Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>ART 1030</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>6 or 7</td>
<td>ART 1030, studio elective</td>
<td>3, 3</td>
</tr>
<tr>
<td>Art B (SL)</td>
<td>5 - 7</td>
<td>ART 1030</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry (SL)</td>
<td>5 - 7</td>
<td>CHEM 1010, CHEM 1020</td>
<td>8</td>
</tr>
<tr>
<td>Economics (SL)</td>
<td>6 or 7</td>
<td>ECON 2010, ECON 2020</td>
<td>6</td>
</tr>
<tr>
<td>French A1 (SL)</td>
<td>6</td>
<td>FREN 1010, FREN 1020</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>FREN 2010, FREN 2020</td>
<td>6</td>
</tr>
<tr>
<td>German A1 (SL)</td>
<td>6</td>
<td>GERM 1010, GERM 1020</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>GERM 2010, GERM 2020</td>
<td>6</td>
</tr>
<tr>
<td>Language A1 (SL)</td>
<td>6</td>
<td>ENGL 1010</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>ENGL 1010, ENGL 1020</td>
<td>6</td>
</tr>
<tr>
<td>Further Mathematics</td>
<td>No credit awarded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematical Studies (SL)</td>
<td>No credit awarded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics (SL)</td>
<td>5</td>
<td>MATH 1710</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics (SL)</td>
<td>6</td>
<td>MATH 1710, MATH 1830</td>
<td>3, 3</td>
</tr>
<tr>
<td>Music A (SL)</td>
<td>5</td>
<td>No credit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 or 7</td>
<td>MUS 1030</td>
<td>3</td>
</tr>
<tr>
<td>International Baccalaureate Course</td>
<td>Minimum Required Score</td>
<td>TTU Equivalent</td>
<td>Credit Hours Earned</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------------------</td>
<td>----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Art (HL)</td>
<td>5</td>
<td>Studio Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>6 or 7</td>
<td>Up to six credit hours studio elective with portfolio review</td>
<td></td>
</tr>
<tr>
<td>Biology (HL)</td>
<td>5 - 7</td>
<td>BIOL 1010, BIOL 1020 or BIOL 1110, BIOL 1120</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry (HL)</td>
<td>5 - 7</td>
<td>CHEM 1110, CHEM 1120</td>
<td>8</td>
</tr>
<tr>
<td>Economics (HL)</td>
<td>5 - 7</td>
<td>ECON 2010, ECON 2020</td>
<td>6</td>
</tr>
<tr>
<td>French A1 (HL)</td>
<td>5</td>
<td>FREN 1010, FREN 1020</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6 or 7</td>
<td>FREN 2010, FREN 2020</td>
<td>6</td>
</tr>
<tr>
<td>German A1 (HL)</td>
<td>5</td>
<td>GERM 1010, GERM 1020</td>
<td>6</td>
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<tr>
<td></td>
<td>6 or 7</td>
<td>GERM 2010, GERM 2020</td>
<td>6</td>
</tr>
<tr>
<td>History (HL)</td>
<td>5 - 7</td>
<td>Lower-division history elective</td>
<td>3</td>
</tr>
<tr>
<td>Language A1 (HL)</td>
<td>5</td>
<td>ENGL 1010</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>6 or 7</td>
<td>ENGL 1010, ENGL 1020</td>
<td>6</td>
</tr>
<tr>
<td>Mathematics (HL)</td>
<td>5 - 7</td>
<td>MATH 1730, MATH 1910</td>
<td>5, 4</td>
</tr>
<tr>
<td>Philosophy (HL)</td>
<td>5 - 7</td>
<td>PHIL 1030</td>
<td>3</td>
</tr>
<tr>
<td>Physics (HL)</td>
<td>5 - 7</td>
<td>PHYS 2010, PHYS 2020</td>
<td>8</td>
</tr>
<tr>
<td>Spanish A1 (HL)</td>
<td>5</td>
<td>SPAN 1010, SPAN 1020</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6 or 7</td>
<td>SPAN 2010, SPAN 2020</td>
<td>6</td>
</tr>
<tr>
<td>Theatre Arts (HL)</td>
<td>5 - 7</td>
<td>THEA 1030</td>
<td>3</td>
</tr>
</tbody>
</table>
ADMISSION BY EXAMINATION (GED APPLICANTS)

Applicants who have not graduated from high school but whose corresponding high school class has graduated must submit an official transcript of the General Educational Development (GED) Test. The minimum average score required on the GED test is 525, or an ACT composite score of 19. An ACT score is required of all applicants who are under 21 years of age or over 20 years of age and seeking majors in engineering, computer science, or math. All GED students must be tested by the COMPASS. (ACT scores less than three years old may be substituted for COMPASS scores.) Applicants who earned GED diplomas in 1989-1992 are subject to the foreign language unit requirement. Applicants who earned GED diplomas in 1993 and after are considered to have met all high school unit requirements except those in foreign language and visual or performing arts. For application procedures, see Application Procedures for Freshmen.

ACADEMICALLY TALENTED HIGH SCHOOL (PRE-FRESHMAN)

Academically talented students may be admitted into the Pre-Freshman Program by having a planned Individual Education Program (IEP). The following criteria must be met by each applicant.
1. Enrollment recommended as a part of the student’s planned Individual Education Program (IEP) as determined by the multi-disciplinary team process.
2. Certified to be academically talented or gifted according to the criteria for certification of intellectually gifted which are contained in the Tennessee State Department of Education Student Evaluation Manual.
3. Have a school grade point average which is the equivalent of at least 3.2 on a 4.0 scale.
4. Must have fully utilized the school’s or school system’s courses in the desired area of study, or must have satisfactorily completed tests for these courses with a score of 75 or better.
A student who does not have an IEP may be admitted to the Pre-Freshman Program by meeting all of the following criteria:
1. A recommendation from the high school guidance counselor.
2. A minimum high school grade point average 3.5 on a 4.0 scale or an ACT composite score of 25.
Admission in the Pre-Freshman program will allow enrollment in one course per semester if seats are available. Approval from the academic department to enroll in the desired course is also required. Exceptions to take more than one course may be made. Please seek permission from the Admissions Office. College credit will be given for courses that are satisfactorily completed. This admission is not available for enrollment in activity or private instruction courses. A semester grade of “B” or better is expected; however, a semester review of the student’s success will be performed by the University to determine whether continued enrollment is allowed. It is expected that such students return to their high school for completion of the senior year and graduation.

EARLY ADMISSION

The high-achieving student who has completed the junior year with not less than twelve academic (English, science, history, mathematics, foreign languages) units, who has a 3.2 (on a 4.0 scale) grade point average, and an ACT composite score of 26 or higher may be considered for admission to Tennessee Technological University without high school graduation. All other admission requirements must be met.

A letter must be received from the high school principal specifying the college courses that will be substituted for the remaining high school courses.
Letters of recommendation from the high school counselor and from parents must also be received.
Early Admission students should follow the admission procedures as freshmen (see Application Procedure for Freshmen).

ADMISSION AS A TRANSFER STUDENT

An applicant who has begun college elsewhere (following high school graduation or receiving a GED) is a transfer student. If the student has completed less than twenty-four transferable semester hours of degree credit (college-level courses), the admission application will be evaluated on a combination of college-level and high school course work as well as college entrance examination results.
1. Applicants for transfer from another college or university must request official transcripts which bear the seal of each institution attended to be mailed by each institution attended. No transcript from any institution previously attended may be omitted. The student shall also submit any other records or letters which the University may require in support of the application.
2. Applicants for transfer upon graduation from a Tennessee Board of Regents community college, having earned an A.A. or A.S. in a university-parallel program, will usually be eligible for admission.
3. Transfer applicants must meet the following academic standards based on all of their previous coursework (except developmental studies courses) at all institutions. (1) Must have a minimum cumulative GPA of 2.0; (2) Must have at least a 2.0 in their last full-time semester (or last 12 hours for part-time students).
The Admissions Office will also evaluate the student’s progress toward completing any required high school deficiencies and remedial/developmental courses. Failure to complete such courses may result in a denial of admission.
4. An applicant under disciplinary suspension or probation will not be considered for admission until a satisfactory statement has been furnished by the
5. Complete and return the Student Health Form and
Hepatitis/Meningitis Waiver form before registering for
classes. Forms are available to download from the
Health Services website at
www.tntech.edu/healthservices. (See “Health
Requirements” section for more information.)
6. The applicant will be notified of the admission status
after all credentials have been received and evaluated. Tentative admission may be granted on
the basis of partial transcripts if the quality of work is
clearly acceptable. Final admission is granted only
after all transcripts and credentials are received. Upon
acceptance the student will be sent a Letter of
Admission.
All applications from students whose native language
is not English will be screened by the English
Placement Committee, and such students may be
required to take a placement test at Tennessee Tech
for the purpose of validating previous English study
and/or placement in English courses, including
English composition and English as a Second
Language. The English placement test may not be
taken more than once.

READMISSION OF FORMER STUDENTS

A former student of Tennessee Technological
University who is not currently enrolled at the University
must file an application for re-admission. The application
may be obtained online at www.tntech.edu/applyonline or
downloaded from www.tntech.edu/admissions/forms and
should be filed no later than thirty (30) days prior to the
first day of registration to be considered for the semester
in which he/she wishes to enroll. No application fee is
required for readmission students.

For students who have been suspended two or more
times or dismissed, a Request for Readmission After
Suspension should also be filed no later than ten days for
American students and six weeks for international
students prior to the beginning of the semester for which
they are applying. Readmission decisions for suspended
or dismissed students are determined by the Admissions
and Credits Committee. Students should contact the
Office of Residential Life concerning on-campus housing
requirements (See Residential Life).

ADMISSION AS A SPECIAL UNDERGRADUATE
STUDENT

A Special Undergraduate Student is not a candidate
for a degree; however, this classification allows one to
register for an undergraduate course or courses, to
obtain a grade, and to have this grade recorded in the
student record file. This category would include those
students who have received a bachelor's degree and are
wanting to take additional undergraduate courses as well
as students with no degree but taking undergraduate
courses for credit. Regular students who currently are not
in good standing at the last college attended cannot be
admitted as a special student. Admission as a Special
Undergraduate Student may be granted a person if it
appears that he or she may successfully engage in college
work and that enrollment will be beneficial to the person
and to the University.
Admission as a Special Undergraduate Student does not guarantee enrollment in any course. After having been admitted, the student is subject to normal procedures for registering in courses. Applications for this category should be filed at least 30 days prior to the beginning of the semester in which enrollment is desired. All fees are the same as for regular students.

All individuals wishing to be admitted in this category should check the appropriate box for “Special Undergraduate Student” on the application for admission. The COMPASS assessment is required for students enrolling in English or mathematics courses. Special students are not eligible for Federal and State need-based financial aid.

ADMISSION FOR SECOND BACHELOR DEGREE OR TEACHER CERTIFICATION

A student working towards a second bachelor degree or teacher certification is one who has already earned a baccalaureate degree from Tennessee Technological University or another collegiate institution who is not working toward a graduate degree, but who takes graduate or undergraduate courses for credit toward a second undergraduate degree or teacher certification. Such students, including those previously enrolled at Tennessee Technological University, must apply for admission and pay regular fees. Those students entering the University for the first time must pay the non-refundable application fee of $25. A student who is seeking another undergraduate degree should file an application for graduation during the first semester of attendance. A student should not register for graduate courses without prior permission from the Associate Vice President for Research and Graduate Studies. Credit earned in this classification cannot be counted for graduate degree purposes.

ADMISSION AS A TRANSIENT STUDENT

A transient student is one who is regularly enrolled in another collegiate institution and who desires admission for one semester. The student is required to submit an Application for Admission (available online at www.tntech.edu/applyonline or downloaded from www.tntech.edu/admissions/forms) and to furnish a letter of good standing from the college in which he or she is enrolled. The student should check the appropriate box for “Transient” on the paper application. Credit is given and transcript admission is for one semester only. A Transient Student who wishes to become a regular student must file an appropriate application and meet the requirements for admission as a Transfer Student.

Transient students are not eligible for Federal and State need-based financial aid.

ADMISSION TO CLASS AS AN AUDITOR

An auditor is one who enrolls in classes on a non-credit basis, is expected to attend class, but is not required to hand in assignments or to take examinations. If the instructor is not satisfied with the attendance, the instructor may assign a grade of “W.” A student who audits must be admitted to the University as a regular or special student.

Admission to class as an auditor requires the consent of the advisor of the instructor and the approval of the Office of Records and Registration. The applicant should secure the Audit Registration form from the Office of Records and Registration. Fees for audit courses are the same as those for credit courses.

Audit requests will be processed only until the last day to register, add, or change sections as published in the University Academic Calendar each semester. An audit grade cannot be reversed for a letter grade once the semester begins.

Students are not allowed to audit Learning Support Program courses.

ACADEMIC FRESH START

(Tennessee Board of Regents Policy 2:03:01:01)

Academic Fresh Start is a plan of academic forgiveness provided for undergraduate students who have gained maturity in learning through extended experience outside higher education institutions. The Academic Fresh Start allows the calculation of the quality point average and credit hours toward graduation to be based only on work done after returning to college. The student must be separated from all collegiate institutions for at least four (4) years and all prior degree credit will be forfeited. Academic Fresh Start is not available for students who have already earned a college degree.

After applying for the Fresh Start at the time of readmission or admission in degree status, but prior to the completion of 15 hours of degree coursework, a student must complete at least fifteen (15) semester hours of earned degree coursework with a minimum QPA of 2.0 for all work attempted (including repeats) and completed all of the developmental course work if any is needed. In no case will a student who attempts more than 24 semester hours (equivalent of two semesters of full-time work) and has not earned a 2.0 QPA be allowed to continue in the program. Please note that the Academic Fresh Start plan does not erase or forgive prior academic work as it relates to federal financial aid.

Please contact the Office of Admissions for complete information and the procedures to apply for Academic Fresh Start.

HEALTH REQUIREMENTS

There are health requirements with which the student must comply prior to beginning classes. These requirements are not for the purpose of limiting admission, but are to promote a healthy student body.

1. Complete Student Health form, including immunization records.

2. State Law requires each postsecondary institution in Tennessee provide students with information concerning hepatitis B and meningococcal meningitis.
infections. All students must complete a Meningococcal Meningitis and Hepatitis B Immunization Health History Form.

3. Recommend TB skin test or assessment before enrollment.

PLEASE COMPLETE THESE AND RETURN TO THE STUDENT HEALTH SERVICES PRIOR TO BEGINNING CLASSES. Forms are available online at www.tntech.edu/healthservices.

Special programs of study such as nursing may have additional requirements.

The Health Service also strongly recommends proof of a tetanus booster immunization within the last 10 years.

RESIDENCE CLASSIFICATION

The residence of a dependent student is presumed to be that of his or her parents. Residence is interpreted to mean where the parents are domiciled. Students once classified as out-of-state students will continue to be so classified during their continuous enrollment excluding summer semesters.

Change of residence status for tuition purposes is never automatic. A request for review must be made to the Office of Admissions, and adequate information must be provided by the student to warrant a review of resident status. If the review is negative, a request for exception may be filed with the Office of Academic Affairs and then the Admissions and Credits Committee.

If Tennessee residency is approved, the classification change shall be effective at the next registration after the approval has been granted.

ADMISSION OF INTERNATIONAL STUDENTS: UNDERGRADUATE STUDY

Tennessee Technological University encourages its faculty, staff, and administrators to foster the enrollment of qualified international students in suitable programs, to work with Embassies and Sponsoring Agencies to attract students whose academic potential has already been recognized in their home countries, and to provide appropriate services for international students who enroll at the University. Admissions applications for international students may be obtained from Tennessee Tech’s website: (www.tntech.edu/international/).

An international student is classified for educational purposes as a person who is a citizen and permanent resident of a country other than the United States. Permanent Residents of the US with less than four full years of regular high school English will also be considered international students for English Placement Testing purposes. Tennessee Tech University is authorized under Federal law to admit international students.

All international students whose native language is not English must have an official Test of English as a Foreign Language (TOEFL) score or its equivalent. The admission requirements for international students applying to college for the first time are as follows:

1. Be at least 16 years of age.
2. Graduate from a Secondary School with proof of such with diploma and support documentation showing all years of high school course work.
3. Demonstrate competence in basic courses at the secondary level that are closely related to the intended major program of study at the University.
4. International students who will be applying for a student visa are recommended to complete the application 3 to 6 months in advance. Students who reside in the USA may apply up to one month in advance. The following items are required for admission.
   a. $30 non-refundable application fee.
   b. Tests which demonstrate proficient English skills (for students from countries where English is not the primary language). TOEFL test scores should be sent directly from the testing agency. Please use the institution code of 1804 when requesting that scores be submitted directly to TTU. A TOEFL institutional score of 490 or its equivalent on the internet based TOEFL or Computer Based TOEFL will be acceptable for a provisionally admitted student and the student must maintain 2.0 cumulative grade point average by the end of the 2nd semester or the student will be dismissed. Acceptance of Institutional TOEFL scores originating from Intensive English Language Programs (copy accepted since only one copy is issued or guaranteed by school administrator). If TOEFL test scores are not available, then alternative tests which can be submitted for admission.

Students may provide an alternate test such as ONE OF THE FOLLOWING (which can be used in place of the TOEFL requirement).

<table>
<thead>
<tr>
<th>TEST ORIGINATOR</th>
<th>Minimum Score required</th>
</tr>
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</table>
| TOEFL – Test of English as a Foreign Language | 490 paper-based  
|                                          | 163 computer-based  
|                                          | 57 internet-based             |
| IELTS – International English Language Testing System | 5.0                             |
| EIKEN                                    | 2 A Grade (College of Junior College Level) |
| TOEIC - Test of English for International Communication | 580                             |
| ITEPS (The International Test of English Proficiency) | 4.5                              |
| Pearson PTE                             | 52                               |
| English Language Program Levels          | ELS level 109  
|                                          | FLS International level 7        |
**Tennessee Technological University**

<table>
<thead>
<tr>
<th><strong>International English Institute level 6</strong></th>
<th>International Baccalaureate (IB credit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Language Company level 8</td>
<td>C grade or better from an accredited US Canadian/British/New Zealand or Australian based college</td>
</tr>
</tbody>
</table>

| **Michigan Test (MELAB)** | 80 |
| **Cambridge IGCSE or O Level English** | Level O/A AS levels |
| **International Baccalaureate (IB credit)** | IB credit of C or better in the IB English course |

| **Two semesters or three quarters of college-level English composition from an accredited college or university (Non-USA based schools may require the WES or another NACES member)**. |

<table>
<thead>
<tr>
<th><strong>ACT</strong></th>
<th>English 19 <em>can be used to replace the TOEFL requirement</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Math 19</td>
</tr>
<tr>
<td></td>
<td>Reading 19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SAT</strong></th>
<th>Critical Reading 460 <em>can be used to replace the TOEFL requirement</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Math 460</td>
</tr>
<tr>
<td></td>
<td>Students interested in scholarships should submit a score of 600 or more.</td>
</tr>
</tbody>
</table>

*Note: TTU offers conditional letter of admission to applicants who meet the academic and financial requirements but whose English language proficiency does not meet the levels for full admission. Students who receive a conditional letter of admission must provide one of the English test scores or provide proof of completion of one of the ESL Language Center completion levels. The student upon arrival at TTU to assess their need for additional language instruction must take the COMPASS exam in reading, writing and math. If the COMPASS exam shows the student needs additional English support, then he/she must enroll in additional English language courses, taught through the FLS International center at TTU. These courses will likely delay the start of a student's academic program. Students may also be asked to take the COMPASS math, reading and writing test again in Learning Support at the end of their FLS international coursework. International Undergraduate students who complete advanced levels at partnered Intensive English Language programs will be permitted to enroll at Tennessee Tech University by waiving the English test score requirement. These students must meet all other requirements for admission at TTU. These students must also take the reading, writing and math Compass exam prior to registering for classes. The students whose Compass Exam results do not meet the requirements for Learning Support courses or English Composition will be required to enroll in classes at FLS International.*

5. Students must also provide an official academic record which includes all course and all years completed at the secondary (high school) level, which includes grades earned, final examination scores, diplomas, matriculation record or leaving certificate. The admission decision will be based on the student's own educational grading system. All records should be in the original language with the institution's seal, accompanied by a certified English translation. Students who have advanced placement credits such as the SAT Subjects exam, GCE levels (A-levels, O-levels, AS-levels), International baccalaureate (IB), Sijil Pelajaran Malaysia (SPM), Abitur from Germany, IGSCE, HKALE, Studentsprof/Menntaskoli and Italian Maturita exam scores must provide these documents during their application. As a result the students will be eligible for credit.

6. International Undergraduate Students who plan to transfer credits from a university or college program from abroad are required to have all transcripts evaluated by an accredited evaluation firm which can be found at NACES website which is listed at: [http://www.naces.org/members.htm](http://www.naces.org/members.htm)
The student's home institution is required to submit originals to the selected evaluation firm. Some of the most commonly used evaluation firms include WES, Josef Silny, Global Credential Evaluators, and Foreign Academic Credential Service. Upon arrival to TTU, the students must meet with the departments pertaining to their courses to determine if the individual department chairpersons will assign and transfer credit in regards to equivalency of each class. The Office of International Student Affairs is not responsible for the acceptance or denial of coursework of the academic departments.

7. A student must submit a bank document from the student's parent or sponsor verifying the student has sufficient funds to sponsor their program of study. We recommend the student contact the immigration specialist in the Office of International Student Affairs. The letter from the bank must provide proof of the funds on deposit, indicating the availability of the funds and the period for which the funds have been on deposit. Please contact the Office of International Student Affairs to determine the minimum balance for issuance of ones I-20. The estimate of fees includes tuition and registration fees, books and supplies, room cost, meal cost, grooming, insurance, recreation and travel, for three semesters or one academic year. TTU offers financial assistance in the form of part-time work on campus at minimum wage with a limit of 20 hours per week (positions are competitive and
not guaranteed). Short-term loans are available in emergency cases. Grants or scholarships available for non-immigrant F-1 or J-1 students are extremely limited. Deadline for scholarship from the departments, need-based and academic, is December 15th, the year before the term. December 15th is the deadline for both the fall and spring terms. The Honors program offers scholarships for students with excellent grades and high ACT or SAT scores.

8. A housing application for living on campus is available at [http://www.tntech.edu/reslife/applications/](http://www.tntech.edu/reslife/applications/). There is a $100 deposit which is not transferable. Students may request a refund if they know they will not be attending TTU 2 months in advance to their start date.

9. Non-immigrant students graduating who are studying in the USA must submit the following additional documents to complete their application to TTU:
   a. A photocopy of the passport showing the expiration date and bio page.
   b. A photocopy of their current visa.
   c. A photocopy of the current I-20 or DS 2019.
   d. International Advisor’s Reference Form will need to be submitted to TTU from your current program advisor (this form is available from TTU’s Immigration Specialist.)

10. Students must also complete and submit student health forms prior to the beginning of classes. Students must provide proof of 2 doses of the Measles, Mump, and Rubella (MMR) vaccinations/inoculations and submit a TB skin test with proof of a negative result in writing or x-rays (with proof being TB free) or visit TTU’s Health services office to have the required test or vaccinations/inoculations (these test are not free). The Varicella (Chicken Pox) vaccine is also required for students who cannot show proof of a previous diagnosis as a child or adult. The vaccine requires two inoculations. Students who do not complete the above inoculations/vaccines will not be eligible to register full-time until these exams and inoculations are completed. The student health forms can be found at the Health Services website [http://www.tntech.edu/healthservices/forms/](http://www.tntech.edu/healthservices/forms/). Students can either send the inoculations directly to TTU’s health services or to the Office of ISA at PO Box 5093 Cookeville, TN 38505.

11. International Students will be permitted to enter the USA from abroad at least 60 days prior to the beginning of the semester. An F-1 student should not leave home prior to receiving a TTU Certificate of Admission and the I-20 (Certificate of Eligibility). A J-1 student should not leave home prior to receiving a TTU Certificate of Admission and the DS 2019 (Certificate of Eligibility for Exchange Visitor Status). Before applying for one’s visa, a student must pay the SEVIS fee of $200 at [https://www.fmjfee.com/i90fee/](https://www.fmjfee.com/i90fee/). Frequently asked questions on the SEVIS fee can be found at [http://www.ice.gov/sevis/i901/aq4.htm](http://www.ice.gov/sevis/i901/aq4.htm).

Students who are initially applying for a visa MUST pay the SEVIS fee (I-901). Students presently in the USA do not need to do this requirement. These documents, as well as the sponsor’s financial letter must be presented to the certifying officer at the American Consulate General’s office in order to obtain an F-1 or J-1 visa.

**REQUIREMENTS FOR INTERNATIONAL STUDENTS ON ARRIVAL AT TTU**

1. **ENGLISH PLACEMENT TEST.** All international students whose native language is not English are required to take the COMPASS Exam if they have not taken the ACT or SAT exam. This includes English as a Second Language (ESL) and/or English composition. The cost of the English placement test is $10 and $20 for any retakes thereafter. To take the English Placement test, a student must provide identification. Students that score below the established norm for placement in the Learning Support coursework may not take regular courses which require reading and writing (e.g. psychology, US History and literature) until their English is at an acceptable level thus the student will be required to enroll in FLS International English courses.

2. **ENGLISH AS A SECOND LANGUAGE (ESL).** Unless specifically exempted by the Compass exam, all international students are required to take DSP Writing or DSP reading unless they provide an ACT or SAT score which exempts them taking the exam and the classes must be completed during their first two semesters at TTU. International students will take ESL courses concurrently-FLS International center in the discipline which is recommended based on the Compass exam concurrently with their major program of study courses. DSP Reading and DSP Writing are prerequisites to ENGL 1010 and ENGL 1020, as well as to HIST 2010 and HIST 2020.

3. **COMPASS TEST.** The COMPASS math test will be administered to first-semester undergraduate international students who score less than 19 in the math portion of the ACT or less than 430 in the math portion of the SAT prior to enrollment. Some undergraduate international students are required to take the English and reading portions of the COMPASS test after passing the FLS International English course. The purpose of these tests is to validate previous math and English study and/or placement in math and English courses. These tests are required by TTU’s governing body, the Tennessee Board of Regents.

4. **AMERICAN HISTORY.** All undergraduate international students who have not completed one
International students who are required to take FLS international coursework must enroll in American history upon completion of the ESL courses provided by FLS International and DSPR 0800 and continue in consecutive semesters until they have earned six hours in American history (HIST 2010 and HIST 2020).

5. All international students who are required to take FLS international coursework must enroll in American history upon completion of the ESL courses provided by FLS International and DSPR 0800 and continue in consecutive semesters until they have earned six hours in American history (HIST 2010 and HIST 2020).

6. All international students should report to the Office of International Student Affairs upon arrival at TTU. The staff will assist the international student with checking into the residence hall, depositing checks, registration, etc., at the beginning of the semester. International services and programs are administered in this office.

7. All non-immigrant F-1 and J-1 international students will be required to purchase and maintain health insurance. The student’s individual or TTU coverage must include medical expenses for accident, illness, evacuation, and repatriation.

International students who wish to apply for admission to the Graduate School should address correspondence to the Associate Vice President for Research and Graduate Studies and should use the Graduate School application forms which will be furnished upon request.

STUDY ABROAD

Study Abroad scholarships are available to help defray the costs of travel and insurance for students participating in TTU-approved programs.

Costs for the ISEP reciprocal exchange are set by TTU based on the usual fees, room, and board. Payment is made directly to TTU. Transportation, insurance, books, and incidental expenses are the only additional costs. Most forms of financial aid can be applied to the year of study abroad in the ISEP program. Students are also encouraged to participate in exchange programs with Tennessee Technological University’s sister institutions abroad or pursue non-affiliated, independent study abroad programs. In addition, the International Business and Cultures program offers study abroad opportunities through the Magellan Exchange. Information on all study abroad opportunities open to TTU students is available in the Office of International Student Affairs, Room 103 Derryberry Hall, phone 931-372-3634.

There is a course sequence to register for these international student exchanges similar to Co-op. See STUDY ABROAD in the course description section.
institutions will not be entered on the records until the student’s transfer credits have been validated.

Advanced standing will not be granted for credit from an institution which is not a recognized college or university. An alternate plan for transfer students in this category permits the establishment of 14 hours of credit by special examination as provided below. See also, Advanced Placement with Credit.

Community College Credits. A student transferring credit from a two-year institution must complete a minimum of 60 semester hours at a senior institution. Residency and other degree requirements of Tennessee Tech must be met.

Credit in Religious Studies. A maximum of 12 semester hours of credit in religious history and/or literature, but not doctrine, may be accepted.

DANTES Examinations - Defense Activity for Non-Traditional Education Support. Students may earn college credit for DANTES examinations administered by the Educational Testing Service and evaluated using ACE Guidelines. Credit through DANTES examinations may not be earned for courses in which previously or currently enrolled, including courses failed in residence, for courses in which credit already has been earned in coursework at a higher level, or for both the DANTES examination and its equivalent course. Students wishing specific information on transferability regarding certain DANTES exams must check with the academic unit pertaining to the subject of the exam. DANTES examination scores must be sent to the Office of Admissions on an official transcript form sent directly from the Educational Testing Service (ETS). See the Transfer Coordinator for further information on DANTES tests.

Educational Experiences in the Armed Forces. In evaluating armed services credit, Tennessee Technological University follows the recommendations of the Guide to the Evaluation of Educational Experience in the Armed Services, published by the American Council on Education, if there is equivalent course content at Tennessee Tech. Servicemembers should be prepared upon entrance to present to the University their discharge or service records (Form DD-214), or a transcript of credits earned while in the armed services, for evaluation.

Students who have had 4 or more months of active service in the U.S. armed forces may be given credit not to exceed the 8 hours (6 hours military science elective credit and 2 hours physical education credit) for the military science course. A student requesting credit for prior ROTC training or active Military Service must obtain certificate from the Department of Military Science. When appropriate, the allowable credit may be given in freshman and sophomore physical education. Tennessee Technological University is a member of Servicemembers Opportunity Colleges and participates in the Concurrent Admissions Program (ConAP).

International Transfer Credit. Any undergraduate student (domestic, permanent resident or international) who completed coursework abroad (with the exception of study abroad with TTU) is required to have coursework evaluated by a member of the National Association of Credential Evaluation Services (NACES) www.naces.org. A course by course evaluation is required for any transfer credit to be awarded.

The credit will be posted as elective credit and the grades will be posted based on the evaluation report and transcript. To appeal credit for a specific course offered by TTU, the course description must be supplied in English to the International Student Affairs Office or the Undergraduate Admissions Office. The department chair of the course’s discipline will review to determine if the course is equivalent.

A student who does not submit their transcripts to a NACES organization for evaluation will not receive any credit. Transcripts must be submitted to Undergraduate Admissions Office and to the Office of International Student Affairs for admission purposes. Not submitting the information could be grounds for dismissal from the University.

Credit Established by Professional Certificate or Non-Credit Courses. Academic credit may be awarded on occasion for professional certification or non-credit courses. Requests for the award of such credit must be submitted to the departmental chairperson of the department in which credit is being sought. As the executor of departmental policy, he or she will evaluate the requests and submit a recommendation to accept or reject them to the college dean and Office of Records for final approval.

Establishment of Credit by Special Examination. A student who has had sufficient training or experience in a subject to merit the establishment of credit by comprehensive examination but who has not enrolled in the same, comparable, or higher level course at the college level may request the privilege of taking a special examination prepared by the department involved. The request for special examination is secured from the Office of Records and Registration, and the required signatures of approval are obtained, after which the student pays the special examination fee of $20.00 per semester hour to the Business Office. The results of such an examination will be recorded on the student’s permanent record. Not more than 14 semester hours may be established by special examination. To establish credit in this manner, a student must be enrolled in the University. Only grades of A, B, C, D and F will be assigned.

Correspondence, Extension Work and Study at Other Institutions. A student who wishes to enroll for correspondence courses, extension work, or residence study at another institution with the intention of transferring this credit to Tennessee Technological University should have prior written approval from the Dean of the school or college in which the student proposes to graduate. The appropriate request form is obtained from the Office of Records and Registration. Work taken without such approval may be presented for evaluation but will be subject to approval or disapproval. Official transcripts should be furnished immediately upon the completion of such work. Correspondence credit in Freshman English and courses which include laboratory work will not be accepted.

A student in residence at Tennessee Technological University who wishes to take correspondence work from
another institution while enrolled at the University will be permitted to do so only if he or she is unable to arrange a schedule for the course on campus. The student needs to file with the Office of Records and Registration a Request for Correspondence Study or Request for In-Residence Study at Another Institution approved by the advisor and the chairperson of the department in which the work is offered on campus before enrolling for the work. Such courses taken off campus are counted as part of the student's load and are subject to the regulations concerning load.

Not more than 33 semester hours of correspondence and credit established by special examination may be counted toward graduation. Credit granted in the formal AP program may be more extensive. Not more than 4 semester hours of correspondence and extension credit in professional education courses may be counted toward graduation or teacher certification.
FEES

Fees, conditions of assessment, and refund policies are subject to change without prior notice by action of the Tennessee Board of Regents. All registration fees, dormitory rent and meal plan charges are payable in advance unless a deferred payment plan is approved (available for fall and spring semesters only). For more information about the deferred plan, including service charges, late fees, minimum deferrable amounts, etc., [www.tntech.edu/bursar/deferred](http://www.tntech.edu/bursar/deferred) contact the Business Office Accounts Receivable section.

Maintenance fees (in-state tuition) and out-of-state tuition are calculated based upon the number of Student Credit Hours (SCH’s) for which a student is enrolled including any courses taken on an audit basis. **Fee rates are based upon student level (graduate or undergraduate) rather than on the course level.** For example, a graduate student choosing to enroll in an undergraduate course will be assessed graduate level rates. The full hourly rate will apply to the first 12 hours taken by an undergraduate and to the first 10 hours taken by a graduate student. A discounted hourly rate will apply to enrollment beyond these base hours.

Developmental courses are charged at the two-year institution hourly rates. If a student enrolls in both regular and developmental courses, rates shall be assessed at the hourly rate for each up to the current amount of 12 undergraduate hours. The discounted tuition rate will then apply to any additional courses.

**RODP and DMBA fees are calculated separately and payable in addition to the main campus fees.** Fees for RODP and DMBA hours are not subject to a discount for enrollment beyond 12 undergraduate or 10 graduate hours. Full hourly rates are assessed for all RODP and DMBA enrollments.

The summer semester is divided into two sessions. Students may register and pay fees for the full summer or for each session separately. For summer semester, fees are assessed at the full hourly rate and are not subject to discount for enrollment beyond the base hours. Also note the deferred payment plan is not available for summer semester.

In addition to in-state and out-of-state tuition, other fees are applicable. See the Bursar Office website at [www.tntech.edu/bursar](http://www.tntech.edu/bursar) for a comprehensive listing of current fees and the corresponding refund policies.

**No student may enroll or receive a diploma, transcript of records, or grade report until all matured debts or obligations to the University, or any phase of its program, have been cleared.**
ACADEMIC REGULATIONS AND REGISTRATION

THE SCHOOL YEAR

The school year consists of two semesters of approximately fifteen weeks each, and a summer term of ten weeks with some courses offered in two five-week sessions. A student may graduate in three years by attending three summer terms in addition to three regular years.

The Summer School. The University maintains a summer term with some courses offered in two five week sessions. Courses are scheduled so a student may complete a semester of course work if enrolled in both summer school sessions.

New students and former students not currently enrolled who expect to attend summer school should consult the catalog section entitled "Admission and Expenses."

The summer term is considered equivalent to other semesters at Tennessee Technological University in regard to retention. The student on probation in summer is subject to the regular probation stipulations, including load and requirements for removing probation.

The official last day of the term is the Friday before graduation.

DEFINITION OF A CREDIT HOUR

Tennessee Technological University is organized on the semester basis. When the term hour or credit is used, it refers to a semester hour credit. A semester hour is one hour of class, recitation, or two or more hours of laboratory work, per week through one semester of approximately fifteen weeks. Laboratory hours per credit are determined by department or college.

Classification (Year Level)

Course Completed          Hours  Classification
0-29.9                   Freshman
30-59.9                  Sophomore
60-89.9                  Junior
90 and greater           Senior

Courses are numbered according to the following pattern:

COURSE NUMBERS

0800-0999 Developmental Courses (Such courses do not carry credit toward a degree).
1001-1999 Music Courses for Multiple Credit
1000-1999 Freshman Level
2000-2999 Sophomore Level
3000-3999 Junior Level
4000-4999 Senior Level
5000-5999 Graduate Level
6000-6999 Graduate (Restricted to Graduate Students)

In the Catalog listings, courses offered at the senior level that may be taken at the graduate level show the graduate course number in parentheses beside the senior number.

OFFICIAL NOTICE

A notice to report to any administrative office of the University takes precedence over all non-instructional activities, and must be answered immediately or, if received during a class, as soon as the class is over. Failure to respond to such a notice will require satisfactory explanation to the Administrative Council before the student is allowed to continue in residence.

UNIVERSITY REQUIREMENTS FOR A BACCALAUREATE DEGREE

Each student is personally responsible for completing all requirements established for his or her degree by the University, college, and department. It is the student's responsibility to inform himself or herself of these requirements. A student's advisor may not assume these responsibilities. Any substitution, waiver, or exemption from any established requirement or academic standard may be accomplished only with appropriate approval.

In addition to the requirements listed below, other requirements for a given degree and major may be determined by consulting the portion of the catalog devoted to the particular college or school offering the degree. International students must fulfill all requirements but should consult the special provisions described in Admission of International Students: Undergraduate Study of this catalog.

1. General Education Requirements: 41 semester hours selected from courses in 6 categories (see table below).

General education, the foundation of the undergraduate collegiate experience, encompasses the knowledge, skills, attitudes, and values that are obtained from studies in communication, mathematics, social and natural sciences, and humanities. General education is unbounded by academic disciplines and honors the relationships among bodies of knowledge. General education develops the cognitive process of reasoning essential for effective functioning and self-directed learning. General education provides opportunities for the student:

- to think logically, critically, and creatively;
- to communicate effectively both orally and in writing;
- to read extensively and perceptively;
- to explore moral and aesthetic values, social relationships, and critical thinking through the humanities;
- to understand the importance of key social institutions, ethics and values, and how individuals influence events and function with
others in these institutions throughout the world;
• to appreciate creative and aesthetic expressions along with their impact on individuals and cultures;
• to express, define, and logically explore questions about the world through mathematics;
• to use computer technology to communicate and to solve problems;
• to use acquired facts, concepts, and principles of the physical and natural sciences in applying the scientific process to natural phenomena;
• to perceive the importance of wellness and values in human life;
• to manifest a commitment to lifelong learning.

These outcomes will be acquired in the general education requirements with additional depth obtained in the curriculum of the major and through participation in extracurricular activities.

COMMON CATALOG STATEMENT REGARDING GENERAL EDUCATION

Effective Fall Semester 2004, each institution in the State University and Community College System of Tennessee (The Tennessee Board of Regents System) will share a common lower-division general education core curriculum of forty-one (41) semester hours for baccalaureate degrees and the Associate of Arts and the Associate of Science degrees. Lower-division means freshman and sophomore courses. The courses comprising the general education curriculum are contained within the following subject categories:

**BACCALAUREATE DEGREES AND ASSOCIATE OF ARTS AND ASSOCIATE OF SCIENCE DEGREES**

<table>
<thead>
<tr>
<th>Category</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>9 hours**</td>
</tr>
<tr>
<td>Humanities and/or Fine Arts</td>
<td>9 hours</td>
</tr>
<tr>
<td>Social/Behavioral Sciences</td>
<td>6 hours</td>
</tr>
<tr>
<td>History</td>
<td>6 hours***</td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>8 hours</td>
</tr>
<tr>
<td>Mathematics</td>
<td>3 hours</td>
</tr>
<tr>
<td>Total</td>
<td>41 hours</td>
</tr>
</tbody>
</table>

*Foreign language courses are an additional requirement for the Associate of Arts (A.A.) and Bachelor of Arts (B.A.) degrees. The B.A. degree requires proficiency in a foreign language equivalent to completion of two years of college-level work. The A.A. degree requires proficiency in a foreign language equivalent to completion of one year of college-level work.

**Six hours of English Composition and three hours in English oral presentational communication are required.

***Students who plan to transfer to Tennessee Board of Regents (TBR) universities should take six hours of United States History (three hours of Tennessee History may substitute). Students who plan to transfer to University of Tennessee System universities or to out-of-state or private universities should check requirements and take the appropriate courses.

Although the courses designated by Tennessee Board of Regents (TBR) institutions to fulfill the requirements of the general education subject categories vary, transfer of the courses is assured through the following means:

• Upon completion of an A.A. or A.S. degree, the requirements of the lower-division general education core will be complete and accepted by a TBR university in the transfer process.

• If an A.A. or A.S. is not obtained, transfer of general education courses will be based upon fulfillment of complete subject categories. (Example: If all eight hours in the category of Natural Sciences are complete, then this “block” of the general education core is complete.) When a subject category is incomplete, course-by-course evaluation will be conducted. The provision of block fulfillment pertains also to students who transfer among TBR universities.

• Institutional/departmental requirements of the grade of “C” will be honored. Even if credit is granted for a course, any specific requirements for the grade of “C” by the receiving institution will be enforced. In certain majors, specific courses must be taken also in general education. It is important that students and advisors be aware of any major requirements that must be fulfilled under lower-division general education.

Courses designated to fulfill general education by Tennessee Tech University are published below. A complete listing of the courses fulfilling general education requirements for all system institutions is available on the TBR website (www.tbr.state.tn.us) under Transfer and Articulation Information.

TTU COURSES RECOMMENDED FOR THE TBR GENERAL EDUCATION CORE

<table>
<thead>
<tr>
<th>Communication (9 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English composition (6 hours)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1010</td>
<td>Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020</td>
<td>Writing II</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>SPCH 2410</td>
<td>Introduction to Speech Communication</td>
<td>3</td>
</tr>
<tr>
<td>PC 2500</td>
<td>Communicating in the Professions</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1010</td>
<td>Introduction to Contemporary Mathematical Ideas</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1130</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1410</td>
<td>Survey of Elementary Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1530</td>
<td>Elementary Probability &amp; Statistics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1630</td>
<td>Finite Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1710</td>
<td>Pre-Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1720</td>
<td>Pre-Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1730</td>
<td>Pre-Calculus Mathematics</td>
<td>5</td>
</tr>
<tr>
<td>MATH 1830</td>
<td>Concepts of Calculus</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1910</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>HIST 2010</td>
<td>American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020</td>
<td>American History II</td>
<td>3</td>
</tr>
<tr>
<td>ART 1030</td>
<td>Art Appreciation</td>
<td>3</td>
</tr>
<tr>
<td>*ENGL 2130</td>
<td>American Literature</td>
<td>3</td>
</tr>
<tr>
<td>*ENGL 2230</td>
<td>British Literature</td>
<td>3</td>
</tr>
<tr>
<td>*ENGL 2330</td>
<td>World Literature</td>
<td>3</td>
</tr>
<tr>
<td>FREN 2510</td>
<td>French Culture and Civilization</td>
<td>3</td>
</tr>
<tr>
<td>GERM 2520</td>
<td>German Culture and Civilization</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1010</td>
<td>Survey of European Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1020</td>
<td>Survey of European Civilization II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1110</td>
<td>World Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>Hours</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>HIST 1120</td>
<td>World Civilization II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1310</td>
<td>Science and World Cultures</td>
<td>3</td>
</tr>
<tr>
<td>MUS 1030</td>
<td>Music Appreciation</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 1030</td>
<td>Introduction to Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 2510</td>
<td>Spanish Culture and Civilization</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 2550</td>
<td>Latin American Culture and Civilization</td>
<td>3</td>
</tr>
<tr>
<td>THEA 1030</td>
<td>Introduction to Theater</td>
<td>3</td>
</tr>
<tr>
<td><strong>Social/Behavioral Sciences (6 hours)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGBE 2010</td>
<td>World Food and Society</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 1100</td>
<td>Introduction to Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2010</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2020</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 1120</td>
<td>Human Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 1130</td>
<td>Geography of Natural Hazards</td>
<td>3</td>
</tr>
<tr>
<td>POLS 1000</td>
<td>American Government</td>
<td>3</td>
</tr>
<tr>
<td>PSY 2010</td>
<td>General Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 1010</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>WGS 2010</td>
<td>Introduction to Women and Gender Studies</td>
<td>3</td>
</tr>
<tr>
<td><strong>Natural Sciences (8 hours)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASTR 1010</td>
<td>Introduction to Modern Astronomy I</td>
<td>4</td>
</tr>
<tr>
<td>ASTR 1020</td>
<td>Introduction to Modern Astronomy II</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1010</td>
<td>Introduction to Biology I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1020</td>
<td>Introduction to Biology II</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1110</td>
<td>General Zoology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1120</td>
<td>General Botany</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1310</td>
<td>Concepts of Biology and Environment</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 2010</td>
<td>Human Anatomy &amp; Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 2020</td>
<td>Human Anatomy &amp; Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>CHEM 1010</td>
<td>Introduction to Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1020</td>
<td>Introduction to Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1110</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1120</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1310</td>
<td>Concepts of Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 1040</td>
<td>The Dynamic Earth</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 1045</td>
<td>Earth Environment, Resources, and Society</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 1310</td>
<td>Concepts of Geology</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 1310</td>
<td>Concepts of Physics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 2010</td>
<td>Algebra-based Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2020</td>
<td>Algebra-based Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2110/2111</td>
<td>Calculus-based Physics I (with lab)</td>
<td>4 (3+1)</td>
</tr>
<tr>
<td>PHYS 2120/2121</td>
<td>Calculus-based Physics II (with lab)</td>
<td>4 (3+1)</td>
</tr>
</tbody>
</table>

2. **Special course requirements:**
   1. English must be taken each semester, except the summer, until this requirement is completed. ENGL 1010-ENGL 1020 may not be dropped. Correspondence credit in ENGL 1010-ENGL 1020 will not be accepted.
   2. The prerequisite for ENGL 1020 is a grade of C or better in ENGL 1010, and the prerequisite for a 2000-level English course is a grade of C or better in ENGL 1020. If a transfer student has completed two semesters of composition and has a grade of D in ENGL 1020, then the student must repeat ENGL 1020 before beginning the literature courses. ESL classes do not satisfy the ENGL 1010 and ENGL 1020 communication requirement of the general education core, nor do these courses count toward any degree requirements.
   3. Students must take a mathematics course, including ADP if necessary, no later than their second semester at TTU and take mathematics each semester thereafter until the mathematics general education core requirement is satisfied.
   4. Completion of the curriculum for the major subject and degree chosen, as outlined under the department in which the major is offered. A major is outlined under the chosen curricula and must contain at least 6 hours of upper division in residence at Tennessee Technological University.
   5. A minimum of 120 semester hours, including 36 hours of 3000 and 4000 level upper-division credit approved courses are required for a baccalaureate degree*. Not more than 33 semester hours may be earned by correspondence, workshop or extension, or by a combination of these and special examination. Not more than 12 semester hours in music ensembles, Physical Education 1010-1990, and Military Science activity courses may be counted toward graduation. (Not more than 12 semester hours of credit in activity courses may be counted toward the Bachelor's degree requirement.) *Programs requiring fewer than 120 hours must have the approval of the Academic Council.
   6. A general quality point average of 2.0 (C) and a general average of 2.0 in the courses offered in the major subject. Transfer students also must attain at Tennessee Technological University a general average of 2.0 and an average of 2.0 in the courses taken in the major subject.
   7. Each academic department is to ensure that its candidates for graduation have satisfactorily corrected deficiencies in communication skills so that they will be able to read, write, speak, and comprehend on a level that will permit them to function successfully in their chosen fields as college graduates.
   8. All faculty members are encouraged to report students judged deficient in communication skills to the student's major department for referral to the Writing Center.
   9. Students who are majoring in another field but are taking course work in the College of Business must limit credit for the degree in business courses to 25 percent of the degree or 24 hours for the 120 hour degree as limited by AACSB.
10. **Definition of Minors:** A minor is 15 hours. A student may elect to complete more than one minor.

1. A minor in any specific discipline in the College of Arts and Sciences must include 6 Upper Division hours. A minor in English may not include ENGL 1010 or ENGL 1020. A minor in Mathematics must include MATH 1910 and MATH 1920 and it may not include a course numbered below MATH 1910.

2. A minor in Art, Music or Physical Education may contain no more than 4 hours of individual instruction, ensemble, or activity courses. Other minors are defined as follows:

   - **Agriculture:** 15 hours (including 6 upper division hours) approved by the student's academic advisor.
   - **Art:** A minor in art is ART 1010 - Two-Dimensional Design or ART 2010 - Three-Dimensional Design, ART 1030 - Art Appreciation, ART 2310 - Drawing I, Introduction, and Studio Electives—6 credit hours.
   - **Business:** A minor in Business shall consist of ACCT 3720, BMGT 3510, MKT 3400, FIN 3210, and LAW 3810. Students must also complete ECON 2010-ECON 2020 for the Social Science component of their General Education requirements or as General Electives.
   - **Computer Science:** Students must complete fifteen (15) semester hours of CSC courses including CSC 2110, CSC 2111 and at least six (6) upper division CSC hours.
   - **Education:** Any combination of 15 semester hours chosen from Art Education (ARED), Early Childhood Education (ECED), Educational Psychology (EDPY), Elementary Education (ELED), Foundations of Education (FOED), Music Education (MUED), Reading (READ), Secondary Education (SEED), and Special Education (SPED).
   - **Human Ecology:** A minor must include HEC 1000, HEC 1010, HEC 3011 and eight credit hours of HEC electives.
   - **Humanities:** Any combination of 15 semester hours chosen from Art (ART), English (ENGL), Foreign Languages (FREN, JAPN, SPAN, or RUSS), Music (MUS), Philosophy (PHIL), and Theatre (THEA).
   - **Industrial and Systems Engineering:** ISE 3100 - Engineering Economy, ISE 3200 - Engineering Statistics and a set of three additional courses to be chosen as follows:
     - **Emphasis in Engineering Management:** BMGT 3510 - Management and Organization Behavior, ISE 4000 - Engineering Leadership and Project Management, and ISE 4510 - Engineering Design Internship or other engineering capstone design course with team-based project.
     - **Emphasis in Quality Engineering:** Six Sigma Tools: ISE 3220 - Design of Experiments, ISE 4230 - Quality Control, ISE 4240 (5240) - Quality Engineering

11. **Exams for teaching licensure:** All students, irrespective of the College or School in which enrolled who will have completed licensure requirements for teacher education as a part of the total hours required for graduation are required to take the Praxis II (NTE) Examinations: the Core Battery and the appropriate specialty examination(s).

12. **Catalog to follow:** To graduate, a student meets the requirements of the catalog effective at the time he or she entered the curriculum, provided graduation is within seven years from that entrance date, or the catalog in effect at the time of graduation. If a student is out of the university at least one full year, the student must meet with the department chairperson upon re-entering into the program to determine which catalog to follow. "Catalog" refers specifically to degree requirements in this section. Degree requirements for all students, regardless of date of enrollment in their curricula, may be subject to change prior to the publication of a new catalog when the implementation of curricular changes is necessary to maintain quality programs. The designated catalog for graduation must be approved by the departmental chairperson if different from the one in effect when a student entered the curriculum or the catalog in effect at the time of graduation. Students entering a curriculum in the summer are expected to follow the catalog for the next academic year. A Tennessee public community college student may select the Tennessee Tech Catalog effective at the time he or she enters the community college if that
Tennessee Technological University

student enrolls at Tennessee Tech within six years and continues in the major chosen while in community college.

13. Credit which was earned earlier than ten years prior to the proposed date of graduation will be subject to review and approval by the academic department of the student's major.

14. Filing of application for Graduation: All candidates for an undergraduate degree should file a written application for graduation in the Office of Records and Registration prior to two semesters of their anticipated graduation. The final day to apply for a given class is:

<table>
<thead>
<tr>
<th>Graduation Semester</th>
<th>Last day to Apply for Graduation</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Summer 2010</td>
<td>May 7, 2010</td>
</tr>
<tr>
<td>Fall 2010</td>
<td>August 6, 2010</td>
</tr>
<tr>
<td>Spring 2011</td>
<td>December 17, 2010</td>
</tr>
<tr>
<td>*Summer 2011</td>
<td>May 6, 2011</td>
</tr>
</tbody>
</table>

*There will not be a commencement ceremony for those graduating in August. Students who wish to participate will be allowed to return to the University for the December commencement ceremony.

15. Completion of requirements policy: All requirements for graduation must be filed in the Office of Records and Registration no later than 2 days prior to commencement with the exception of transfer work in progress. All transcripts must be received no later than 2 weeks after the commencement date otherwise the student graduates the following semester.

16. The University will modify degree requirements when possible for students whose disabling conditions prevent completion. Students whose disability might prevent completion of a program should consult with the Office of Admissions when applying for admission or with his or her academic advisor during the first semester of enrollment. Students may be required to take one or more tests designed to measure general education achievement and achievement in major areas as a prerequisite to graduation, for the purpose of evaluation of academic programs. Students should sign up as indicated. Unless otherwise provided for any individual program no minimum score or level of achievement is required for graduation. Participation in testing may be required of all students in selected programs, and of students selected on a sample basis.

PARTICIPATION IN COMMENCEMENT

To be eligible to participate in any commencement ceremony you must meet the following requirements:

- Have applied for graduation for that semester by the application deadline
- Be enrolled in all courses to complete the degree requirements during the week of final exams

GRADUATION INSTRUCTION FOR UNDERGRADUATE DEGREE CANDIDATES

For information regarding the disbursement of diplomas, caps and gowns, graduation and rehearsal, special facilities, attendance, absentia status, honors, and photographs please refer to the web link http://www.tntech.edu/records/commencement/

REQUIREMENTS FOR A SECOND UNDERGRADUATE DEGREE

A student may qualify for a second baccalaureate degree from Tennessee Technological University by completion of a minimum of 30 semester hours at Tennessee Technological University beyond the requirements for the first baccalaureate degree, providing the student meets all prescribed requirements in the specified curriculum for the second degree and with the approval of the chairperson of the department offering the second degree. A person who has a baccalaureate degree from another institution* and who, in addition, desires a baccalaureate degree from Tennessee Technological University must fulfill all requirements for a second degree as stated in the previous paragraph and must complete a minimum of 25 percent of the credit for the degree in residence. TTU general education requirements will be considered met, with the following exceptions:

- Any general education courses that are required for progression in the major program must be completed.
- In addition, if the first baccalaureate degree is from a non English-speaking university, the student must complete DSP Reading and DSP Writing or pass the Compass Exam or complete any additional ESL support work needed in the necessary discipline at FLS International prior to enrolling in DSP reading and DSP writing.

*American degrees must be accredited by an approved agency, and foreign institutions must be approved as “reputable.” These approvals will be obtained through consultation with the Director of International Student Affairs, the relevant TTU department chairs, and/or appropriate faculty members.

IDENTIFYING COURSES SATISFYING THE MINIMUM DEGREE REQUIREMENTS

Although the courses fulfilling the minimum degree requirements may vary in actual design among institutions, many contain similar content. These courses are identified by common course rubrics (prefixes) and numbers in all TBR institutions to facilitate transferability. The actual courses designated by each institution to fulfill the Minimum Degree Requirements, including courses that may not be a part of the common course prefix and numbering pattern, are denoted in catalogs by the * symbol. A complete matrix of courses that satisfy the Minimum Degree Requirements at all TBR institutions and an explanation of the common course rubric and numbering system are available on the TBR web page (http://www.tbr.state.tn.us/).

TENNESSEE BOARD OF REGENTS/UNIVERSITY OF TENNESSEE UNIVERSITY TRANSFER TRACK MODULE

Students who wish to fulfill core curriculum requirements for institutions in both the Tennessee Board of Regents (TBR)
Tennessee Technological University

System and the University of Tennessee (UT) System may do so by completing the TBR-UT University Track Module. The Module consists of a sixty (60) semester hour block of courses in eight categories of subjects. The University Track Module incorporates the minimum degree requirements of all TBR and UT institutions and requires the completion of courses within the following subject categories:

Category 1: Two English Composition Courses (normally 6 credit hours)
Category 2: Two Mathematics Courses (normally 6 credit hours)
Category 3: Two Science Courses (normally 6-8 credit hours)
Category 4: Five History and Humanities Courses (normally 15 credit hours)*
   *Six credit hours of history are required. The type of history required varies among public universities in Tennessee. Check university catalogs to determine the proper history courses to take. Tennessee Technological University requires American History for all majors except engineering majors.
Category 5: Two Social/Behavioral Science Courses (normally 6 credit hours)
Category 6: Two Multicultural or Interdisciplinary Courses or Two Foreign Language Courses (normally 6 credit hours)
Category 7: Two Physical Education Courses (normally 2 credit hours)
Category 8: Pre-major/Major Elective Courses (normally 12-15 credit hours)

The choice of courses depends upon the intended major at the university to which transfer is planned. Students planning to transfer to a Tennessee public university are expected to work with their academic advisors to ensure that all courses taken within the categories are appropriate to their intended majors. Courses to be transferred under the stipulations of the University Track Module must have been completed with the grade of “C” or better.

HONORS

Undergraduate Honors. The honor roll for each semester shall be known as the "Dean's List." To receive this honor a student shall be a full-time (12 semester hours Fall and Spring or 8 semester hours Summer), regular undergraduate, having a semester's grade average of 3.1 or higher. ADP courses will not be included in the calculation of grades for honors.

Commencement Honors for baccalaureate degrees shall include:

- **cum laude** 3.5 quality point average
- **magna cum laude** 3.7 quality point average
- **summa cum laude** 3.9 quality point average

HONORS PROGRAM

Tennessee Technological University provides a full Honors Program to stimulate the academically gifted student to achieve his or her full potential. Admission is limited to students with a 3.5 or better cumulative quality point average, or who do exceptionally well on entrance examinations. Those students who complete Honors Program requirements for graduation have "in cursu honorum" inscribed on their diplomas and transcripts and are so designated on the graduation program. For further information, contact the director of the Honors Program, and see "Honors Program".

HONOR SOCIETIES

Tennessee Technological University recognizes scholarly achievement and encourages student excellence and participation in a large number of academic organizations. Honor societies in specific areas include:

- Alpha Kappa Delta (Sociology)
- Alpha Lambda Delta (Freshmen)
- Alpha Mu Gamma (Foreign Languages)
- Alpha Pi Mu (Industrial Engineering)
- Alpha Psi Omega (Theatre)
- Associated Scholars Guild (Honors Program)
- Beta Alpha Psi (Accounting)
- Beta Beta Beta (Biology)
- Beta Gamma Sigma (Business)
- Chi Epsilon (Civil Engineering)
- Delta Tau Alpha (Agriculture)
- Epsilon Pi Tau (Industrial Technology)
- Eta Kappa Nu (Electrical and Computer Engineering)
- Financial Management Association National Honor Society (Finance)
- Kappa Delta Pi (Education)
- Kappa Mu Epsilon (Mathematics)
- Kappa Omicron Nu (Human Ecology)
- Mortar Board (Interdisciplinary)
- Omicron Delta Epsilon (Economics)
- Omicron Delta Kappa (Interdisciplinary)
- Phi Alpha Theta (History)
- Phi Delta Kappa (Education)
- Phi Kappa Phi (Interdisciplinary)
- Pi Kappa Delta (Public Speaking)
- Pi Lambda Lambda (Music)
- Phi Lambda Theta (Education)
- Pi Sigma Alpha (Political Science)
- Pi Tau Sigma (Mechanical Engineering)
- Psi Chi (Psychology)
- Scabbard and Blade (Army ROTC)
- Sigma Iota Epsilon (Business Management)
- Sigma Pi Sigma (Physics)
Tennessee Technological University

- Sigma Tau Delta (English)
- Sigma Theta Tau International (Nursing)
- Society for Collegiate Journalists (Journalism)
- Tau Beta Pi (Engineering)

GRADES AND QUALITY POINTS

On September 1, 1951, the University adopted a 4.0 quality point scale, changing from the 3.0 scale. Grading System. Grades are indicated by letters:

- A -- excellent
- B -- good
- C -- satisfactory
- D -- passing
- F -- failure
- I -- incomplete
- U -- unsatisfactory
- NF -- fail, never attended

Grades are assigned to each semester hour credit as follows:

- For a grade of A, 4 quality points
- For a grade of B, 3 quality points
- For a grade of C, 2 quality points
- For a grade of D, 1 quality point
- For grades of F, I, IF, X, U, NF, W, SU, SP, NP, P, and AU, no quality points.

Quality points. Quality points are assigned to each semester hour credit as follows:

- For a grade of A, 4 quality points
- For a grade of B, 3 quality points
- For a grade of C, 2 quality points
- For a grade of D, 1 quality point
- For grades of F, I, IF, X, U, NF, W, SU, SP, NP, P, and AU, no quality points.

Quality Point Average. The quality point average for the semester is determined by dividing the total quality points earned by the total semester hours attempted. The cumulative quality point average is determined by dividing the total quality points for all semesters by the cumulative hours (total hours minus first repeats). Non-credit and Remedial and Developmental courses are disregarded in computing the college level quality point average for graduation.

When a course is repeated, only the credits for the last time the course was attempted are counted toward graduation. In computing the cumulative quality point average for graduation, the original grade is voided. Credits attempted with a grade of "W" are disregarded, but credits attempted with grades of U, X, NF and IF (incomplete calculated as F) are counted.

Grade of I (Incomplete). An "I" is assigned when a student's performance has been satisfactory, but for reasons beyond the student's control, he/she has not been able to complete the course requirements within the allotted time as determined by the instructor. Students are not required to register for the courses again. The faculty member files a form in the departmental office outlining the requirements necessary to satisfactorily complete the course at the time final grades are filed. A student has one calendar year or until the time of graduation, whichever comes first, to remove the "I" during which time the "I" is excluded from the calculation of the student's QPA. If the "I" is not removed within the above time limitations, it remains on the student's record permanently and is treated as an "F" in calculating the student's QPA. The "I" grade will appear as an "IF" on the transcript when calculated as an "F" grade.

Midterm Grades. The University recognizes that early warnings are beneficial for students having difficulty in a course. We recommend those faculty members who encourage individual or group help sessions and recommend tutorial laboratories. We recommend that faculty members structure and clearly define the grading system in order that students can determine by mid-term their level of performance. We further recommend that faculty members, whenever possible, contact students at mid-term who are performing poorly and offer assistance and suggestions for improvement. One component of the University's efforts to improve retention involves the implementation of a policy whereby all students having completed fewer than 30 hours of credit will receive a "Midterm Grade" for the courses in which they are currently enrolled, which can be viewed online by the student's advisor. A general outline of the proposed procedure is shown below.

Instructors will indicate whether the student's progress at Midterm was satisfactory (A, B, or C) or unsatisfactory (D or F). It is assumed that each instructor will be readily able to assess whether or not a student's progress was satisfactory. It is also assumed that faculty advisors will make efforts to use this...
Tennessee Technological University

information to assist the student. Midterm grades or lack thereof may not be used as an issue in a grade appeal.

For more specific instructions or information concerning midterm grading, please contact the Office of Records and Registration located in Derryberry Hall, Room 102.

ACADEMIC STANDARDS

Tennessee Technological University expects all students to strive for the highest academic achievement of which they are capable. Knowing that grades, once obtained, become a permanent record, the University is desirous that grades truly represent student accomplishment. A quality point average (QPA) of 2.00 is required to be eligible for the baccalaureate degree. This means that a 2.00 QPA is required over all college work taken, for all courses taken at Tennessee Tech, and for all courses taken in the major field.

It is the intention of the University to give the student ample opportunity to demonstrate satisfactory work. To achieve this purpose, a graduated retention standard scale has been adopted. A student who desires to raise his or her quality point average is encouraged to repeat courses in which he or she has unsatisfactory grades, to consider a reduced load, and to evaluate the choice of major.

Warning. Students who fail to satisfy the minimum semester QPA standard as given in (column 2, Retention Table) will be placed on academic warning. Students who have been issued an academic warning and who fail to meet the minimum semester QPA standard (column 2, Retention Table) the next semester enrolled will be placed on academic probation. In cases where, concurrently, the semester QPA would indicate academic warning and the cumulative QPA would dictate academic probation, the student will be placed on probation.

Probation. Students who fail to maintain the cumulative or current quality point average required for unconditioned retention are placed on probation. This indicates that the quality of work performed is not satisfactory and the student is in danger of suspension unless his/her achievement shows the required improvement.

A student must remove probation the next semester enrolled. He/she must not enroll for more than sixteen hours at Tennessee Technological University during the semester on probation, and fewer hours are recommended many times. A student may remove probation by exceeding the requirements of the Academic Retention Table. If a student does not equal the cumulative requirement of the Academic Retention Table but does meet the semester average requirement, the student will continue on probation.

Suspension. Any student who has been placed on probation and who fails to meet both the required cumulative QPA standard (column 1, Retention Table) and semester QPA standard (column 2, Retention Table) the next semester enrolled will be suspended for a minimum of one semester. The summer term may not be counted as the term of suspension. The only exception to the previous statement is that a student placed on probation and who earns a semester QPA of at least 2.0 (or required minimum semester QPA) the next term enrolled, but who does not raise his/her QPA to the required cumulative QPA standard (column 1), will remain on probation. A student suspended for a second time must remain out of school for one calendar year. If a student is suspended a third time, the student will be denied enrollment in the University for a period of two calendar years. The student may wish to enroll at a community college during that time. If a student remains out of school for four years, the student is eligible to apply for "Academic Fresh Start," which allows the student to begin a brand new academic career.

Retention Table (Effective Fall 2010)

<table>
<thead>
<tr>
<th>Cumulative Hours Attempted</th>
<th>Required Quality Point Average (Column 1)</th>
<th>Required Minimum Semester Quality Point Average (Column 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 - 29.09</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>29.10 - 50.09</td>
<td>1.75</td>
<td>1.75</td>
</tr>
<tr>
<td>50.10 - and above</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Readmission After Suspension. Students suspended for the first time will be accepted for readmission after one regular semester away from the University. The summer session may not count as a term of suspension. A student asking for readmission after a second or third suspension should follow the procedure listed below AFTER being away from the University for one calendar year for a second suspension and two calendar years for a third suspension:

1. Apply for readmission online at www.tntech.edu/applyonline no later than 10 days prior to the beginning of the semester. International students need to apply six weeks before the beginning of the semester.
2. Student must complete the "Readmission after Suspension" application.
3. Student must provide any supporting documents or current academic transcripts to accompany the readmission application.
4. Student must personally explain to the Dean (or his/her designee) of his/her college the reasons for seeking readmission.
5. The readmission application and dean's recommendation will be considered by the University Admissions and Credits Committee.
6. Student will be notified by letter from the Office of Admissions about the status of the readmission application and the terms of readmission (if granted).

Appeal. A student may appeal the suspension by completing the "Readmission after Suspension" application process prior to the term she/he might ordinarily be readmitted after the suspension is completed. The form may be filed at any time after the suspension occurs but must be filed at least 10 days prior to the beginning of the next term for which the student wishes to enroll. During the appeal process, most of the suspensions are upheld with exceptions being made only when rare extenuating circumstances exist. The Admissions and Credits Committee will usually require the student to wait one intervening semester before he or she can be readmitted.

A student suspended for a second time must remain out of school for one calendar year. A student suspended for a third time must remain out of school for two calendar years. After the student has been suspended, the above procedures for readmission will apply. An exception may be
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made for the student who completes an Associate of Arts or Science degree in a university parallel curriculum at a community college in the interim.

REGISTRATION

Registration is available to all formally admitted students and consists of two steps, enrollment in courses and payment of fees. A student must be registered to attend classes. The Web site www.tntech.edu/howtoregister.html contains detailed instructions for completing registration.

Registration Holds. A student may not have finalized all University requirements which results in a registration hold. This "hold" locks the registration process and the student is required to report to the appropriate office before registering to have the hold removed. A student may view their registration holds, if any, by accessing the Registration Status under the Registration Menu on Eagle Online.

Late Registration. Registration is not complete until all fees for the semester have been paid. See www.tntech.edu/bursar/index.html for fee payment/confirmation instructions. A $100 nonrefundable fee will be charged during the entire late registration period as announced in the University Online Calendar.

CHANGES IN REGISTRATION

Change of Course. A student may drop a course or add a course via Eagle Online (www.tntech.edu/eagleonline) until seventh calendar day of the semester.

Dropping a Course. Any student may drop a course except required English Composition, First Year Connections, foreign language courses to remove high course work during the first 14 days of any term longer than seven weeks without receiving a grade for the course. For terms shorter than seven weeks, the first seven days will be utilized. Beginning the 15th day of the semester through the Friday of advisement week a grade of "W" will be given with an advisor's signature on a drop/add form. (See the online calendar's academic schedule for "Last day to drop with grade of W.")

A student may drop a course or add a course via Eagle Online (www.tntech.edu/eagleonline) until seventh calendar day of the semester.

Official Enrollment. Credit will be granted only for courses which appear on the student's official academic record.

Freshman Orientation and Registration. All freshmen and new transfer students will meet for orientation and registration each semester as shown in the University Online Calendar.

Freshman and Sophomore English. Students must register for the required courses in English for each consecutive semester enrolled, except the summer term, until the requirement of ENGL 1010, ENGL 1020, and ENGL 2130, ENGL 2230 or ENGL 2330 is met. Once enrolled, the student may not drop ENGL 1010 or ENGL 1020.

American History. All undergraduate students, except those majoring in engineering, are required to earn 6 hours of American History (HIST 2010-HIST 2020) at Tennessee Technological University or to present acceptable college transfer credits. All undergraduate students, including engineering students, who have not completed one unit of American History at the high school level, or 6 hours of American History in previous college work, must satisfy this requirement. International undergraduate students must complete DSP reading or DSP writing or complete any additional ESL support coursework from FLS international or pass the English Placement Test prior to enrolling in American History. Other undergraduate students will satisfy the requirement as prescribed in the various curricula in the University Catalog.

Major Subject. Each student entering Tennessee Tech will select a major subject or field of interest. He or she is expected to complete the curriculum for the major subject and degree chosen, as outlined under the department in which the major is offered, following the requirements in the University catalog effective at the time he or she enters the chosen curriculum. A student who transfers to another institution and later returns to Tennessee Tech will follow the catalog in effect when he/she returns to the University.

The major subject may be changed by completing a Change of Major form obtained from the Office of Records and Registration. The student takes the form to the former advisor for approval and signature and then to the new advisor for approval and signature. The student then returns the Change of Major form to the Office of Records and Registration.

Second Major. A student may qualify for an additional major or majors by the completion of all prescribed requirements in the specified additional curriculum or curricula.

STUDENT COURSE LOAD

Minimum Course Load. The minimum load for full-time attendance is 12 semester hours. In the summer 4 hours is considered the minimum full-time load per session. (See "Financial Aid").

Normal, Maximum, and Probationary Course Loads. Sixteen to seventeen hours is the normal student load. The maximum credit load for a student in good standing is 20 hours for fall and spring semesters and 15 for summer. The maximum load for students on academic probation is 16 hours for fall and spring semesters and 10 for summer, with the exception of seniors within two semesters of graduation, who may carry 18 if necessary. A student on probation may be advised to take a lower load and must observe the load requirement or violate the terms of his/her probation.

Probation Course Load. The maximum load for students on academic probation is 16 semester hours for fall and spring semesters, and 10 for summer, with the exception of seniors within two semesters of graduation, who may carry 18 if necessary. A student on probation may be advised to take a lower load and must observe the load requirement or violate the terms of his/her probation.

Academic Development Program Course Load. Students enrolled in developmental classes (courses beginning
Tennessee Technological University

with DSP) should enroll in no more than a total of 16 semester hours for fall and spring semesters, and 10 for summer.

Late Registration Course Load. Those who register late may be required to reduce their load.

Financial Aid. Federal law defines full time for financial aid purposes as being registered for at least 12 semester hours (excluding audit hours) for all semesters. Three-quarter time students include those who register for 9-11 semester hours, and half-time students include those who register for 6-8 semester hours. Students who drop below 6 credit hours during any semester (including summer) may have their financial aid deleted. Students who attend only one (1) summer session may have their financial aid reduced.

Please remember that you must attend class to be eligible for your financial aid. If you WITHDRAW from school, DROP HOURS, or just STOP going to class, you will probably have to REPAY some or all of the aid you received.

REPETITION OF COURSES

A student may repeat a course which was previously taken and received a final grade of C or lower. Students are permitted to repeat a course in which a grade of B or higher was earned only with the approval of the Provost and Vice President for Academic Affairs.

Courses may be repeated with only the first attempt being replaced by the second attempt. Any successive attempts will count in the cumulative grade point average with the last attempt standing as the grade in the course and only the last attempt for that course fulfilling the graduation requirement. Courses used to complete the graduation requirement must have a passing grade. This means that you can have credit for a course only one time in the calculated earned hours which apply toward the degree.

Transfer students applying for admission into the University will have their quality point averages recomputed with regard to repeats; their admission and standing will be subject to the revised average.

Although a course may be taken at another school after having received a grade for the equivalent course at this university, it may improve the cumulative QPA but not the Tennessee Tech average. This means that a course, once taken at this university, may not be repeated at another school in order to improve the grade average on courses taken originally at Tennessee Tech.

All grades received for a course will remain on a student's transcript. A notation is added to indicate that the course has been repeated. The information showing the grade received when the course was repeated is given in the report for the semester during which the course was repeated.

MINIMUM CLASS

Normally, the University does not offer a course in the freshman and sophomore years for which fewer than twelve students register, or in the junior and senior years for which fewer than eight students register, or in graduate classes for which fewer than six students register; however, the University is not obligated to offer these courses even though the minimum enrollments are met. The same restrictions are effective for a minimum class in the summer term.

ATTENDANCE AND WITHDRAWAL

Class Attendance. A student is expected to attend each meeting of every class for which he/she is registered. Each instructor is responsible for explaining, in writing, the practice in the treatment of absences at the beginning of each course. Regular class attendance is a definite part of the total performance required for the satisfactory completion of any course, and an unsatisfactory attendance record may adversely affect the final grade recorded for the course. When, in the opinion of the instructor, the attendance record of a student becomes unsatisfactory, the Office of Records will be notified.

Unsatisfactory class attendance may result in the student’s being dropped from a course with a grade of “F.” A student who is unable to return to classes due to an emergency or serious accident should notify the Office of Student Affairs. A student who cannot avoid an absence from a class for any other reason is expected to assume the responsibility of explaining his absence to the instructor and for making arrangements to complete the work missed. Tardiness is recorded as an absence. Students may consider a class dismissed and leave the room without penalty if the instructor fails to appear within fifteen minutes. At the end of each period, a ten minute interval is allowed for changing classes.

Withdrawal from the Institution. Students who desire to withdraw from the institution before the end of a semester must make formal written application for withdrawal in the Office of Student Affairs (also available online at www.tntech.edu/studentaffairs at the time of withdrawal. Those who complete withdrawal procedures will be dropped from each individual course, including required English, Developmental Studies Program, First Year Connections, and courses to remove high school deficiencies, in accordance with the policy on dropping a course. Application for withdrawal will not be considered if received after final examinations begin in any semester.

Students planning to re-enroll should apply for readmission at least 15 days prior to registration. Students who receive a grade of W in the courses do not need to reapply for admission for the next term. Students who received no grade for the withdrawn course should reapply for admission at least 15 days prior to registration. Students withdrawing from summer term do not need to reapply if they plan to re-enroll in the fall.

In the summer term, if a grade has been earned during any of the sessions, withdrawal will be treated as a drop of a course rather than withdrawal so that the grade earned will not be voided by the withdrawal. If a withdrawal has been processed in the summer term and the student wishes to register for a later summer session, the student must go to the Office of Student Affairs and request that the withdrawal be voided.

VETERANS BENEFITS

Eligibility for Deferment of Payment of Tuition and Fees by Certain Eligible Students Receiving U.S. Department of Veterans Affairs or Other Governmentally Funded Educational Assistance Benefits
Tennessee Technological University

Servicemembers, Veterans, and dependents of veterans who are eligible beneficiaries of U.S. Department of Veterans Affairs education benefits or other governmentally funded educational assistance, subject to the conditions and guidelines set forth in Tennessee Code Annotated 49-7-104 as amended, may elect, upon formal application, to defer payment of required tuition and fees until the final day of the term for which the deferment has been requested. Application for the deferment must be made no later than 14 days after the beginning of the term, and the amount of the deferment shall not exceed the total monetary benefits to be received for the term. Students who have been granted deferments are expected to make timely payments on their outstanding tuition and fees balance once education benefits are being delivered, and eligibility for such deferment shall terminate if the student fails to abide by any applicable rule or regulation, or to act in good faith in making timely payments. This notice is published pursuant to Public Chapter 279, Acts of 2003, effective July 1, 2003.

Veterans Administration General Guidelines:

- VA will only pay for courses **required** in the degree you are seeking; therefore, if you wish to take a course that is not required in the degree you are working toward, you must take it above and beyond the credit hours needed for full veterans benefits.
- You must have at least 12 hours of **required** courses in your major to get full veterans educational benefits.
- VA will only pay benefits for one program at a time. If you are working toward two different degrees and/or programs at the same time, you must choose which one will be your primary program to be reported to VA. Your pay will be determined by the hours taken toward your primary program.
- VA will only pay for repeating courses with failing grades, unless the TTU catalog specifically states that a certain grade is required. Also, VA will not pay for a course if you have received equivalent course credit for that course from another institution.
- VA will not pay for auditing a course.
- You must attend your classes in order to receive Veterans Educational Benefits. If you stop attending a class, the instructor will report your last date of attendance to the Records Office and Records will report that date to the VA. VA will adjust your benefits accordingly.

Apply for VA Educational Benefits in the Office of Student Records located in Derryberry Hall, Room 102-D.

TRANSCRIPT OF ACADEMIC RECORDS

A student may obtain a transcript of his or her academic records by making a written request to the Office of Records and Registration, Tennessee Technological University, Cookeville, Tennessee 38505. Financial obligations to the University must be fulfilled prior to release of a transcript copy. There is no charge for a transcript copy; however, any payments received will be used to support the Educational and General Operation of the University.

2011-12 Undergraduate Catalog

PRIVACY RIGHTS OF STUDENTS

On May 20, 1975, Tennessee Tech approved a statement of policy that includes provisions for the release of information about students and the rights of students and others to have access to Tech’s education records. The complete policy statement of "Privacy Rights of Students" is available in the Office of Records and Registration and in the Student Handbook www.tntech.edu/ttustudenthandbook/asp/privacyrights.asp.

USE OF SOCIAL SECURITY NUMBERS

In accordance with the Privacy Act of 1974, applicants for admission and enrolled students are advised that the requested disclosure of their Social Security numbers is voluntary. Students are notified, however, that only the Social Security number may be used as an identifier for grants, loans, and other financial aid programs according to federal regulations. The student’s Social Security number will not be disclosed to individuals or agencies outside Tennessee Technological University except in accordance with the institutional policy on student records.

STUDENT AFFAIRS AND ACTIVITIES

Tennessee Tech provides programs and services which support the students in their intellectual endeavors as well as in their total development. Student Affairs, through its agencies and activities, provides opportunities for students to realize their development potential as physical, emotional, intellectual, social, and spiritual persons. Student Affairs provides for students’ welfare by being available to help them resolve problems which affect their personal well being or which impede their academic progress.

DEAN OF STUDENTS OFFICE

The purpose of the Dean of Students Office is to provide services and programs that enrich the quality of student life and that enhance and compliment the academic mission of Tennessee Technological University by:

- Providing leadership and administrative direction to the Office of Student Orientation and Student Success, and the Office of Judicial Affairs.
- Helping establish and enforce the community standards of the University.
- Responding to the concerns of students, faculty, staff, parents and the community pertaining to student life at the University.

The Dean of Students Office would be the best office for students to visit and receive personalized attention for any concerns they may have at the University.

COUNSELING CENTER

The Tennessee Tech Counseling Center provides a wide range of services designed to help students adjust to and succeed in the university environment. The Center’s services...
include those intended to help students with educational, career, personal, and social concerns. Adjustment to college, stress management, interpersonal relationships, family issues, depression, anxiety, eating disorders, substance abuse, and self-esteem are among the various concerns that students discuss in counseling. In addition to individual counseling, the Center also offers group counseling, which provides students the opportunity to share and learn from others. Strict confidentiality is maintained in the counseling process.

The Counseling Center works with faculty, staff, and student groups within the university community to develop educational programs and projects. These outreach services include workshops that focus on specific issues such as relationships, stress management, test anxiety, study skills, and an array of other topics relevant to the university experience. The Counseling Center also administers a number of standardized tests including ACT, CLEP, MAT, and GRE (subject exam only).

The Counseling Center is located at 307 Roaden University Center. The phone number is (931) 372-3331. Students can call the Counseling Center or check the Center's web site at www.tntech.edu/counsel/ for information regarding walk-in hours, scheduling appointments, workshops, or available groups.

DISABILITY SERVICES

The Office of Disability Services is designed to assist students with disabilities in their educational development and vocational outcomes. The program provides direct assistance in appropriate classroom accommodations, creation and maintenance of an accessible physical environment, access to technology equipment, and encouragement of independence. Students with disabilities are urged to come by the Office of Disability Services in Room 112, Roaden University Center, to discuss their educational plans and special needs. Documentation of a disability by professionals is necessary in determining the level of assistance that might be useful.

EAGLE CARD OFFICE

The Eagle Card -- Every student receives the first Eagle Card (official TTU ID) free of charge. Eagle Cards may be replaced for a $10 fee.

Eagle Cards are used to access Residential Life halls and the Fitness Center. Cards are encoded with meal plans and flex dollars (if purchased). Money may be deposited to use as a debit system in the following areas: Campus Mini-Mart, University Bookstore, MarketPlace (Cafeteria), Starbucks, Swoops (Grill), Outtakes (McCord Hall and the Fitness Center), Café at The Perch (New Hall North), Crav-ns (STEM Center and The Perch in New Hall North), Business Office, Health Services (Infirmary), and the Post Office.

The ID is also used for admission to many student activities, athletic events, cashing checks, etc. Students must present this card upon request from any college official or be subject to disciplinary action.

MINORITY AFFAIRS

The Office of Minority Affairs provides personal, cultural, social and academic growth for students of color. We provide opportunities for all students of color to learn about their history, take pride in their heritage and explore their potential. We promote cultural awareness by providing an environment that embraces diversity. We serve as a cultural resource to the campus and the community through our programming and outreach programs.

Our office provides programs designed to encourage cultural awareness, as well as, educational opportunities outside the classroom. In addition, we provide tutoring, academic counseling and information on scholarships and internships.

Minority Affairs is located in the Leona Lusk Officer Black Cultural Center, which houses a computer lab, conference room and a library of African-American authors. It is a great place to meet new friends and become involved with student organizations.

ORIENTATION AND STUDENT SUCCESS OFFICE

The Orientation and Student Success Office facilitates the transition of new students into Tennessee Tech University. It prepares new students for Tennessee Tech's educational opportunities, and initiates the integration of new students into the intellectual, cultural, and social climate of Tennessee Tech.

STUDENT HEALTH SERVICE

Tennessee Technological University has a student health service which provides medical services for minor illnesses or injuries for any student enrolled at the University on a walk-in basis during hours of operation. The health service staff includes nurses, nurse practitioner, physician, and pharmacist who plan and implement care for students during daytime hours Monday through Friday. The only charge made to a student is for medications, treatments, supplies, or laboratory work.

The student is responsible for expenses incurred for ambulance service, calls at a local physician's office, emergency services, and other services provided at Cookeville Regional Medical Center.

You are required to submit a health history and record of immunization prior to enrolling. These are measles, mumps and rubella (MMR) vaccine and a tuberculosis skin test (or PPD) that has been done within 12 months of school enrollment. Certain programs may have additional requirements. It is recommended that students also have meningitis and hepatitis B vaccine.

MEDICAL INSURANCE

Health and accident insurance is available to each student upon his/her registration at Tennessee Tech. This insurance coverage is authorized and approved by the Tennessee Board of Regents. Coverage provides hospital, surgical, and in-hospital medical protection on a year-round basis beginning with the first day of fall registration and continuing until the first
day of fall registration the following year. Students may enroll in the plan during registration or at any time during the year by picking up an application at the Health Services Office (Infirmary).

Two plans of coverage are available at reasonable rates. Optional maternity coverage is offered under both plans. Details concerning this insurance are available at the Student Health Service Office and during registration. Students are encouraged to participate in one of the insurance plans, as it supplements the above services offered by Student Health Services.

STUDENT ACTIVITIES

Students are encouraged to participate in those extracurricular activities which afford opportunities for the development of individual initiative or group leadership and cooperation. For the purpose of eligibility for participation in institutionally sponsored extracurricular activities, all students are considered to be in good academic standing as long as they achieve sufficient qualitative and quantitative academic progress to allow them to remain enrolled in the institution. (For additional information, see the Academic Retention Table.) Individual organizations or activities within the institution may have additional requirements for participation.

The Student Government Association (SGA). SGA is composed of all full-time undergraduate and graduate students enrolled at Tennessee Tech. Student Government is composed of executive, legislative, and judicial branches. The purposes of the SGA as stated in the constitution are: to promote student participation in the affairs of the University; to serve as a channel for the expression of student opinion; to support student activities on this campus; and to encourage the development of student responsibility, character, leadership, and citizenship.

Campus Recreation. The office of Campus Recreation is designed to offer students an opportunity for wholesome and enjoyable recreation, for physical fitness, and for developing skills that have carryover values. The office of Campus Recreation is located in the Fitness Center facility across from the Hooper Eblen Center. The Fitness Center provides students the opportunity to meet their personal health and fitness needs. Health Promotions Programs provides free fitness evaluations and assistance with meeting fitness goals. Outdoor Adventure Programs coordinates outings for camping, hiking, rafting and more as well as offering rental of camping equipment. Intramurals offers a variety of sports for both men and women. For information on any of these programs, call 372-6212.

Campus Religious Life. The student religious organizations serve students through organized activities and events such as Bible study, worship services, coffee house discussions, dramatic productions, folk masses, choir concerts, evening devotions, student retreats, social issue symposiums, and social activities. Some of these groups have student centers near the campus and invite all students to participate in the programs and events planned and carried out by the students.

Eagle. The student yearbook is edited by students. It is a CD summarizing the highlights of student activities each year.

Fraternities. Thirteen social fraternities are presently active on campus: Alpha Gamma Sigma, Alpha Phi Alpha, Kappa Alpha, Kappa Sigma, Omega Psi Phi, Phi Beta Sigma, Phi Delta Theta, Phi Gamma Delta, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi and Sigma Phi Epsilon, Tau Kappa Epsilon.

Homespun. Published annually by the English Department, Homespun, contains poetry, fiction, drama, essays, photography, and art by students and faculty. Staff members also gain practical experience in magazine layout and design.

Music Organizations. Students are encouraged to participate in the University music organizations. Credit is offered for participation in groups which are organized as classes (see course descriptions). Some of the major organizations are the Bryan Symphony Orchestra, University Orchestra, Concert Choir, Tech Chorale, Madrigal Singers, Women's Glee, Mastersingers, University Wind Ensemble, Symphony Band, Concert Band, Tech Troubadours and Trouveres, Tennessee Tech Golden Eagle Marching Band, Varsity Pep Band, and Golden Eagle Brass.

The Oracle. The Oracle is a weekly newspaper edited by students. This paper contains news items and articles pertaining to the activities of students, faculty, and alumni.

Residence Halls Association. The Tech Residence Halls Association, known as RHA, is the governing body for all students living in residence halls at Tennessee Tech. The purposes of the RHA are to work primarily for the welfare of all residence hall students, coordinate the activities, serve as a channel of student opinion, insure that students are aware of their responsibilities and constitutional rights, encourage the development of responsibility, character, leadership, scholarship, citizenship, and create a new spirit of unity and service.

Sororities. There are seven social sororities active on campus, including Alpha Delta Pi, Alpha Kappa Alpha, Delta Gamma, Kappa Delta, Phi Mu, Delta Sigma Theta, and Zeta Phi Beta.

Tech Village Resident Association. The Tech Village Resident Association, known as the TVRA, is the governing body for all students living in the Tech Village apartments at Tennessee Tech. The purposes of the TVRA are: to be a medium of communication between the residents of Tech Village and the administration of Tennessee Tech; to be an instrument for the purpose of initiating action and for the recommendation of actions toward the improvement and enhancement of resident life, to create, develop and implement social activities for the benefit of the residents, and to be a collective agent in advocacy of the interests of the residents.

WTTU-FM. WTTU-FM, an educational broadcasting service of the University, began broadcasting in May 1972. Students are trained by WTTU staff members and serve in staff positions in news, music, sports, and other programming areas. The WTTU-FM management determines general operating policy in keeping with rules and regulations of the Federal Communications Commission. WTTU has an AP wire service. The 1850 watt station is operated solely by Tech students from 7 a.m. until 1 p.m. at 88.5 MHz FM and 105 FM on the FNI Cable System. Located on the third floor of the University Center, the station consists of offices and studios.

Student Organizations. The University recognizes the role and scope of student organizations in order to make classroom learning relevant to the many interests of its students. Student organizations support the academic program..
CAREER SERVICES

by (1) providing opportunities for developing and using leadership skills, (2) furthering scholastic awareness, and (3) developing professional, social, and individual interests. There are approximately 220 student groups registered on campus, each with a distinctive and unique purpose and program of activities. The Office of Student Activities, Roaden University Center 122, may be contacted with questions about current organizations or starting new organizations.

WHO’S WHO

Selections to Who’s Who Among Students in American Colleges and Universities are made each fall semester from juniors, seniors and graduate students. The selections are based on excellence in scholarship, leadership and participation in extracurricular activities on campus, citizenship and service to the University, and promise of usefulness to business and society.

NATIONAL ORGANIZATION HEADQUARTERS

The University is honored to have the Pi Tau Sigma National Headquarters and the Omega Phi Alpha National Office on campus. They are located in Prescott Hall and Jobe Hall, respectively.

DISTINGUISHED MILITARY STUDENTS

Each year the Professor of Military Science, with the concurrence of the President of the University, is authorized to designate outstanding students of the Army ROTC Advanced Course as Distinguished Military Students. Selection of the students is based on aptitude for military service, high academic accomplishments, leadership ability, and moral character.

ALUMNI ASSOCIATION

The purpose of the Alumni Association is to promote the educational, social, and economic interests of Tennessee Technological University, its faculty, friends, current students and alumni. Graduates of Tennessee Technological University (those receiving a degree) and those completing an approved pre-professional program are recognized as alumni.

The Director of Alumni Relations oversees the activities of the Alumni Association. The work of the Association is administered through the Office of Alumni Relations in conjunction with the Association’s Advisory Board. The Alumni Advisory Board consists of alumni representatives appointed by the Director of Alumni Relations and the current Advisory Board. The Board includes representatives from all six colleges and from the Upper Cumberland, Nashville, Knoxville, Tri-Cities, Atlanta, and Huntsville, Alabama areas. Class years of board members range from the early 50’s thru the late 90’s.

CAREER SERVICES

The Office of Career Services, located on the third floor of the Roaden University Center, provides a variety of career resources for students and alumni. Freshmen and sophomores are encouraged to complete one or more career assessment programs to assist in determining their major course of study and to examine potential employment opportunities within various professions. Full-time students who have reached sophomore status and have achieved a 2.5 overall GPA are eligible to participate in the Cooperative Education Program. Program participants obtain on-the-job learning experiences that can provide a realistic evaluation of a career choice along with giving them the opportunity to earn a supplemental income to aid with college expenses.

Recognizing the benefits to be gained through the use of cutting-edge technology, Career Services maintains a full service web site at (www.tntech.edu/career). Students, alumni, and employers may access information about campus recruiting activities including the ability to post and obtain resumes on-line. Internet "hotlinks" have been set up as a quick resource tool to use when searching the Internet for career resources and job opportunities.

As the university’s centralized recruiting facility, students reaching senior status should register with the office for assistance with their job search. Advice and suggestions to maximize interviewing strategies and resume preparation are also provided. Registration is required for students and alumni to participate in on campus interview activities. Registration is free for all students and alumni.

MOTOR VEHICLES

All students are permitted to maintain vehicles on the campus, subject to the approval of the University. Registration of motor vehicles is required beginning with the fall semester and continuing throughout the entire year. All vehicles operated on campus by full-time, part-time, or night-time students must be registered. Vehicles will be issued permits for specific parking areas, and compliance with all rules and regulations is required. Parking restrictions are effective in parking lots from 7:45 a.m. until 4:30 p.m., Monday through Friday each day that university offices are officially open, except east dorms where 60-minute parking is in effect daily from 7:30 AM until midnight. For information regarding University Police and Parking and Traffic Regulations, refer to the TTU police website at www.tntech.edu/police.

DRUG FREE CAMPUS POLICY

The Tennessee Technological University community (Faculty, Staff and Students) complies with the policies and penalties relative to controlled substances (illicit drugs) and alcohol, as required by the Drug Free Workplace Act of 1988 and the Drug Free Schools and Communities Act Amendments of 1989. As an employee and/or student at Tennessee Technological University, you are required to be knowledgeable of and comply with the Drug Free Campus/Workplace Policy, the applicable provisions of which are summarized below: It is the policy of this institution that the unlawful manufacture, distribution, possession, use or abuse of alcohol and/or illicit drugs on the Tennessee Technological University campus or on property owned or controlled by the University is strictly prohibited. All categories of employees and students are subject to this policy and to applicable federal, state and local laws related to this matter. Additionally, any
Tennessee Technological University

violation of this policy will result in disciplinary actions as set forth in the applicable sections of this policy.

STUDENT RESPONSIBILITY

All students are required to have knowledge of rights, responsibilities and regulations pertaining to campus life which are published in the Student Handbook, www.tntech.edu/studenthandbook/

Each student is responsible for maintaining communication with the University by keeping officials informed at all times of current address (including zip code) and telephone number. Students are responsible for the proper completion of their academic programs; for familiarity with requirements of the University Catalog under which they intend to graduate; for maintaining the grade average required; and for meeting all other degree requirements. A student may receive counsel from an academic advisor; however, the final responsibility remains that of the student.

JUDICIARY PROCEDURES

Judiciary procedures at the University do not constitute legal actions, and the decisions are not to be equated with verdicts reached by courts of law. These procedures simply involve the fact-finding and decision-making processes of an educational institution.

Detailed procedures for the disciplinary system are printed in the "Disciplinary System Manual." Copies of the manual are located in the Dean of Students Office.

RESIDENTIAL LIFE

The Office of Residential Life realizes the impact that living arrangements can create on a student’s life and education. We feel the decision to live in University housing, while attending college, will provide additional opportunities; for personal growth, educational development, connectedness, and leadership experiences. Studies consistently show that students living in the residence halls have higher grade point averages and lower dropout rates and are involved in more campus activities than those living at home or off campus.

TTU campus has 15 residence halls, two for men, one for women’s Village – all female, two coed, Women’s Village and Women’s Issues Village. 2 additional villages each year thereafter; fall 2010 Engineering Village – coed, and lower dropout rates and are involved in more

LIVING-LEARNING VILLAGES

The Village concept was conceived to create smaller, more personal groups within the larger university, to enhance student-faculty interaction beyond the classroom and to enhance positive student connections with the University. Each Village will be organized around a common theme and supported by a Faculty Head working together with the Village residents. Beginning fall 2010 our 1st 2 villages debuted; Environmental Village and Service Village, then with 2 additional villages each year thereafter; fall 2011 Engineering Village and Women’s Issues Village.

NEW HALL NORTH

"Treehouse” Environmental Village

A beautiful co-ed facility, newly opened fall 2010 - housing 238 co-ed residents. New Hall North offers both double and single rooms with private baths. Additional amenities include: a great room for residuals to gather on each floor, laundry rooms on each of the upper floors, as well as three study rooms centrally located within the hall. Also housed in New Hall North is the Environmental Village, including the Faculty Head office. As a part of the “Treehouse” there are a number of activities and programs scheduled throughout the academic year supporting environmental issues and additional opportunities for interaction and connection to the campus community.

Attached to New Hall North is the sorority wing; housing chapter rooms for four campus sororities. “The Perch” (pizza and grill) and convenience store, a recreation area - both located on the first floor, as well as a multipurpose/classroom located on the second floor.

New Hall North is available to all students with selected rooms held for new, incoming freshman residents.

NEW HALL SOUTH

“The Service Station” Service Village

The companion to New Hall North, housing 358 co-ed residents, offers double rooms with private bathrooms. Additional amenities include: an atrium lounge that includes a large screen television and a ping pong table, four study rooms located throughout the hall as well as a multimedia classroom on the fourth floor. Also housed in New Hall South is the Service Village including the Faculty Head office. As a part of “The Service Station" there are a number of activities and programs scheduled throughout the academic year supporting service opportunities and additional chances for interaction and connection to the campus community.

<table>
<thead>
<tr>
<th>Hall Name</th>
<th>Type</th>
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<tbody>
<tr>
<td>Maddux/McCord Halls</td>
<td>Engineering Village – coed</td>
</tr>
<tr>
<td>MS Cooper Halls</td>
<td>International Specialty hall – coed</td>
</tr>
<tr>
<td>Jobe Hall</td>
<td>Business Specialty Hall – coed</td>
</tr>
<tr>
<td>Murphy Hall</td>
<td>Honors Specialty Hall – coed</td>
</tr>
<tr>
<td>New Hall North</td>
<td>Environmental Village – coed</td>
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<tr>
<td>New Hall South</td>
<td>Service Village - coed</td>
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<tr>
<td>Pinkerton Hall</td>
<td>Coed</td>
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<table>
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<tr>
<th>Hall Name</th>
<th>Type</th>
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<tbody>
<tr>
<td>Browning/Evins Halls</td>
<td>all male</td>
</tr>
<tr>
<td>Cooper/Dunn Halls</td>
<td>coed</td>
</tr>
<tr>
<td>Crawford Hall</td>
<td>Women’s Village – all female</td>
</tr>
<tr>
<td>Ellington/Warf Halls</td>
<td>coed</td>
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</tbody>
</table>
Tennessee Technological University

Hall South is available to all students with selected rooms held for new, incoming freshman residents.

MADDUX/MCCORD HALL

Engineering Village

Maddux/McCord Hall is a traditional hall, housing 239 co-ed residents, that offers additional support for engineering students; 5 student engineering coordinators, hired especially to provide direct academic support for engineering students, as well as a computer lab specially equipped with engineering programs, as well as study lounges. Also housed in Maddux/McCord is the Faculty Head office for the Engineering Village. As a part of the Engineering Village there will be a number of activities and programs scheduled throughout the academic year geared towards students talking engineering classes.

CRAWFORD HALL

Women’s Village

A traditional hall located just across from the Nursing & Health Services Building, housing 219 women residents. In addition to the normal traditional hall amenities, also housed in Crawford Hall is the Faculty Head office, study rooms and a classroom for the Women’s Village. As a part of the Women’s Village program there will be a number of activities and events scheduled throughout the academic year selected to support women on a college campus.

SPECIALTY HOUSING

In addition to our Living Learning Villages we also have 3 specialty housing areas: Honors Program located in Murphy Hall. Jobe Hall provides support for business majors. M.S. Cooper Hall is our international hall as well as our hall utilized for break periods. In specialty housing, the Residential Life staff along with program mentors will provide opportunities for students to assist one another, both academically and personally. Activities include faculty involvement programs, study groups, technology resources and academic support programs.

TECH VILLAGE APARTMENTS

There are 300 Tech Village apartments for the following student groups; juniors, seniors, 21 years or older, married, single with children, graduate, and faculty/staff. Beginning fall 2011 the 1st phase of our apartment renovation project will be completed (all apartments will be totally renovated at about 100 apartments per year).

ADDITIONAL BENEFITS OF CAMPUS LIVING

Each residence hall may vary somewhat in the amenities offered, but they all include cable, local phone service, “free” laundry, and RESNET (internet service). All are tobacco free. To view the amenities chart or to apply for campus housing visit our web site at www.tntech.edu/reslife. The web site is full of information, including the campus housing handbook, Guide for Successful Living and a Frequently Asked Questions section. However, if you still find yourself in need of additional information, you can contact us at either reslife@tntech.edu or (931) 372-3414.

If you are interested in living in one of the Villages or any of the other halls, you may make your request on the housing application, on line at: www.tntech.edu/reslife/applications/.

FINANCIAL AID

Many types of financial aid are available for students who attend Tennessee Tech, including grants, loans, student employment, and scholarships. Those types of financial aid based on need are the Federal Pell Grants, Federal Supplemental Education Opportunity Grants, Federal Perkins Loans, Subsidized William D. Ford Direct Loans, the Federal Work Study Program, and the Tennessee Student Assistance Awards for Tennessee residents.

Eligible students may apply for an Unsubsidized William D. Ford Federal Direct Loans. Parents of dependent students may apply for Federal Direct Parent Loans for Undergraduate Students (PLUS), provided that the parents have appropriate credit worthiness.

Students who need financial assistance to enroll at Tennessee Tech should contact the Office of Student Financial Aid in order to be considered for all types of federal aid. The Free Application for Federal Student Aid is available through high school guidance offices and community college financial aid offices as well as from the TTU Office of Student Financial Aid and on the web at www.fafsa.gov. These initial contacts and subsequent filing of needed information should begin after January 1 and before March 15 of the year prior to planned attendance.

To apply for federal aid, complete the "Free Application for Federal Student Aid" (FAFSA) and provide the Financial Aid Office with other documents as requested by our office. Most types of financial aid require maintenance of satisfactory academic progress to continue receiving funds. Appeals based on the school standard are made in cases where special circumstances occur.

Web Site. For further information, visit our web site at: www.tntech.edu/financialaid/home.

Federal Pell Grants. The Pell Grant Program is for undergraduate students who are seeking their first Bachelor’s degree. The amount and recipients of the non-repayable grant is determined by the federal government.

Federal Supplemental Education Opportunity Grants. These grants are for undergraduate students who are seeking their first Bachelor’s degree and show the greatest need, and are awarded on first come basis.

Tennessee Student Assistance Awards. This program is designed to further the opportunity for higher education for residents of Tennessee. Recipients of grants are determined by the Tennessee Student Assistance Corporation based on the need analysis of the family’s financial resources and receipt date of FAFSA.

Tennessee Education Lottery Scholarship (TELS) Program. If you graduate from an eligible high school, home school or GED program and you meet residency and academic criteria, you may be eligible for a HOPE award. To learn more about the current HOPE program, visit the financial aid web site at www.tntech.edu/financialaid/home and click on the Tennessee Education Lottery Scholarship Program logo.
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Federal College Work Study Program. This program provides part-time employment on campus of approximately 10 hours per week during terms of attendance. It is need based, as determined by FAFSA and is awarded on first come basis.

Federal Perkins Loan Program. This repayable loan is available to undergraduate and graduate students. These funds are limited, and are awarded on first come basis.

William D. Ford Federal Direct Loans. This repayable loan is available to undergraduate and graduate students.

Student Employment. In addition to the CWSP, a number of jobs are available where financial need is not the determining factor. Employment is available in the cafeteria, library, fitness center, offices, laboratories, and in other areas of the campus. Students seeking employment under this program should apply directly to the department they wish to work for.

University Loan Fund. Those students interested in borrowing money from these limited emergency funds should contact the Office of Student Financial Aid (on or after the first day of class each semester) to determine their eligibility. Borrowers are required to have two (2) co-signers for these loans, and repayment is generally required before the end of the current semester.

Student Government Association Emergency Loan Fund. Emergency loans not exceeding $250 are also available to students who are currently enrolled at Tennessee Technological University. These loans are granted interest free for up to thirty days. Requests for these emergency loans should be made through the Office of Student Financial Aid on or after the first day of class each semester.

SCHOLARSHIPS

TTU scholarships are available to selected students based on academics, leadership, or other criteria. Other university scholarships include music performance, debate, speech, and departmental scholarships. Most departmental scholarships are donor-funded and have specific individual criteria. These may include demonstration of financial need, county specific criteria, and major specific criteria.

All available scholarships offered by Tennessee Tech are accessible at www.tntech.edu/scholarships by searching ScholarWeb. ScholarWeb moves beyond the traditional search by personalizing the database for TTU scholarships and allowing you to match your qualifications with individual scholarship criteria for which you are eligible.

The University Scholarship Application combines all admissions and departmental scholarship applications into one centralized application process – one stop for students. This allows you to apply for all Tennessee Tech scholarships with just one application. All TTU scholarships require submission of the scholarship application. Scholarship applications are available online through ScholarWeb at www.tntech.edu/scholarships. To be considered for scholarships, students must apply for admission and scholarships by December 15 prior to the year they wish to begin at TTU.

Inquiries and applications should be addressed to the Scholarship Office, Tennessee Technological University, Box 5166, Cookeville, Tennessee 38505 or scholarships@tntech.edu.

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University Academic Service Scholarship for Tennessee Students. The University Academic Service Scholarship is the most prominent university scholarship and is based upon ACT (SAT) scores and high school GPA. These scholarships are offered to high school seniors and community college students who meet all conditions for the scholarship. The scholarships require a service component each semester. Students must maintain full-time status and a 3.0 cumulative grade point average each semester for scholarship renewal. Failure to maintain a satisfactory average or standard of conduct in any semester will result in the automatic forfeiture of a scholarship.

Army Reserve Officers’ Training Corps Scholarship. Students enrolled at Tennessee Technological University are eligible to apply for two-and three-year ARMY ROTC scholarships. These scholarships vary depending on availability.

Applicants are accepted from any four-year degree producing major, except nursing, or any graduate major. Graduates are limited to a two-year scholarship. Certain academic and physical standards must be met to apply. Recipients incur a military obligation. The Professor of Military Science administers the program at Tennessee Tech. The annual application cycle occurs between October and February of each school year.

Tuition Assistance for Guardsmen. Contact your local recruiter.

INTERCOLLEGIATE ATHLETICS

The office of the Director of Athletics is located at the Hooper Eblen Center, the arena where many intercollegiate athletic contests occur. Tennessee Tech is a member of the National Collegiate Athletic Association (NCAA) and the Ohio Valley Conference (OVC). We participate at the NCAA Division I level in fifteen sports and in the NCAA Football Championship Subdivision in football. Tennessee Tech sponsors nine women’s intercollegiate athletic teams (basketball, cross country, indoor & outdoor track, golf, soccer, softball, tennis, and volleyball), six men’s teams (baseball, basketball, cross country, football, golf, and tennis), and one co-ed team (rifle). In addition to intercollegiate sports contests, concerts and other entertainment are occasionally hosted by the Department of Athletics.

In order to participate in varsity athletics, student athletes must satisfy all academic requirements of the University and must make satisfactory progress toward their degrees, as specified by the NCAA and OVC. The policies and activities of the varsity teams are regulated by the Tennessee Tech Athletics Committee, which is composed of students, faculty, and administrative staff. Intercollegiate varsity athletic interests are promoted by the Tennessee Tech Athletic Association.

Each fulltime student receives complimentary admission to all regularly scheduled intercollegiate athletic home games. Since 1925, Tech athletic teams have been nicknamed the "Golden Eagles."

INTERNATIONAL STUDENT AFFAIRS

The TTU Office of International Student Affairs (ISA) is responsible for international undergraduate admissions and
provides international students and scholars with immigration services and community programming. In addition, ISA coordinates study abroad programs for all TTU students.

TTU WOMEN’S CENTER

The TTU Women's Center exists to empower women in the student body, on the faculty, and on the staff of the University community through the dissemination of information, education and consultation. The Center's mission includes collaborating with other functional areas of the University to provide a range of services that will enhance the lives of women and men in the University community. The TTU Women's Center is located in Pennebaker Hall, Room 203. The director may be reached by writing Tennessee Tech, Box 5216, or by phoning (931) 372-3850.
THE GRADUATE SCHOOL

The Tennessee State Board of Education authorized the organization of a graduate program at Tennessee Technological University in May 1958. The first courses for graduate credit were offered in Summer 1958, and the first graduate degrees were conferred the following summer. In support of the objectives of graduate study, programs leading to advanced degrees are available in the various colleges as outlined below:

College of Arts and Sciences

Master of Arts:
- English

Master of Science:
- Biology
- Chemistry
- Mathematics

Doctor of Philosophy:
- Environmental Sciences

College of Business

Master of Business Administration:
- Accounting
- Distance MBA
- Finance
- General Management
- Human Resource Management
- International Business
- Management Information Systems
- Risk Management and Insurance

College of Education

Master of Arts and Specialist in Education:
- Curriculum and Instruction:
  - Curriculum
  - Early Childhood Education
  - Elementary Education
  - Library Science (M.A. only)
  - Reading
  - Secondary Education
  - Special Education
  - Instructional Leadership
  - Educational Psychology & Counselor

Education:
- Agency Counseling
- Case Management and Supervision (M.A. only)
- Educational Psychology
- Mental Health Counseling (M.A. only)
- School Counseling
- School Psychology
- Exercise Science, Physical Education and Wellness (M.A. only)

Doctor of Philosophy
- Exceptional Learning
  - Applied Behavior Analysis
  - Literacy
  - Programming Planning and Evaluation
  - STEM Education

College of Engineering

Master of Science and Doctor of Philosophy:
- Chemical Engineering
- Civil Engineering
- Computer Science (M.S. only)
- Electrical Engineering
- Mechanical Engineering

Regents Online Degree Programs

Advanced Studies in Teaching and Learning (M.Ed.)
Master of Science in Nursing (M.S.N.)
Master of Professional Studies (M.P.S.)
Applications for admission to the Graduate School should be made to the Office of Graduate Admissions at least four weeks prior to the anticipated date of registration. (International students should submit applications at least six months in advance.) Applications for readmission must be filed no later than two weeks before the first day of registration.

Each application must be supported by official transcripts of undergraduate and graduate credit, three recommendations from persons acquainted with the applicant's scholastic and professional accomplishments (Master of Business Administration requires one recommendation), student health form and official scores made on the following: (1) all applicants into programs in the College of Arts and Sciences, the Ph.D. program in the College of Education, and all programs in the College of Engineering must submit scores on the General Test of the Graduate Record Examination; (2) all applicants for admission into the Master of Business Administration program must submit scores on the Graduate Management Admission Test; and (3) all applicants into programs in the College of Education must submit a recent score on the Miller Analogies Test (Master's or Ed.S. only) or Graduate Record Examination.

Admission to graduate study is on a merit basis and is limited to applicants who hold an earned bachelor's or master's degree from an accredited institution whose undergraduate or graduate work is, in the opinion of the Office of Graduate Admissions and the chairperson of the department in which the applicant proposes to study, of sufficient quality and scope to indicate high promise of success in graduate study. The University reserves the right to require additional information and/or performance when it appears that such would be appropriate to the accomplishment of degree requirements or the fulfillment of accreditation objectives.

International students having adequate preparation for graduate study may apply for admission, but applications should be filed at least six months prior to the anticipated date of enrollment. Additionally, all students from non-English speaking countries must submit proof of adequate training and ability in the use of English as evidenced by a score of at least 550 paper-based, 213 computer-based, or 79 internet-based on the Test of English as a Foreign Language (TOEFL), a base score of 5.5 on the International English Language Testing System (IELTS), or completion of level 9 at the FLS International Language Center. If admitted to the Graduate School, such students shall have as a condition attached to their admission the requirement of an additional examination which is arranged for and conducted by FLS International Center or exempt based on their TOEFL score. If the examination reveals that the student does not possess an adequate command of English, the student will be required to enroll in English courses at FLS International and to reduce the graduate course load accordingly.

International students who wish to transfer from another university to Tennessee Tech must submit the usual materials required for initial admission; additionally, each applicant must furnish official transcripts from the current institution as well as a verification statement from that institution's international student advisor, evidence of full financial responsibility, and photocopies of visa and passport expiration dates, I-94, and I-20 identification. Additional information concerning admission, degree requirements, and other aspects of graduate study at Tennessee Tech is found in the Graduate Catalog available online at www.tntech.edu/gcatalog/ or at the Graduate Studies website www.tntech.edu/graduatestudies/. Students who are interested in graduate study in one of the aforementioned academic areas are invited to contact the Office of Graduate Admissions.

Seniors Taking Graduate Courses. Under conditions established by the Graduate School Executive Committee, certain seniors may be permitted to take graduate courses for graduate or undergraduate credit. These conditions have been determined in keeping with standards suggested by various accrediting agencies. Seniors who have an interest in taking graduate courses may obtain additional information from personnel in the Office of Research and Graduate Study, Derryberry Hall. Seniors may not register for any graduate courses (numbered 5000 and above) without obtaining prior written permission from the Associate Vice President of Research and Graduate Studies. Students who have not achieved senior classification are not permitted to take graduate courses. Students in the Second Bachelor Degree or Teacher Certification category may not register for graduate courses without obtaining prior permission from the Associate Vice President of Research and Graduate Studies.
MISSION AND PURPOSES

The mission of the College of Agricultural and Human Sciences is to promote a strong academic environment for its students and to preserve and expand knowledge in the fields of agriculture, human ecology, and nursing, knowledge contained in its library and in the minds and intellects of its faculty. The College is equally supportive of the education of men, women, and minorities. Teaching, research, and public service activities form a foundation for College goals of:

1. Providing a baccalaureate degree in the fields of agriculture, human ecology, and nursing that will prepare students for entry and advancement in those fields.
2. Providing curricula that will prepare agriculture, human ecology, and nursing students for entry and advancement in graduate/professional programs.
3. Providing educational experiences that will enhance agriculture, human ecology, and nursing student leadership and social development.
4. Conducting scholarly and public service activities that will enhance the fields of agriculture, human ecology, and nursing.

ORGANIZATION

The College of Agricultural and Human Sciences consists of three schools offering curricula leading to the bachelor's degree: (1) the School of Agriculture, (2) the School of Human Ecology, and (3) the Whitson-Hester School of Nursing.

REQUIREMENTS FOR DEGREE

Curricula in the School of Agriculture lead to the degree of Bachelor of Science in Agriculture. In the School of Human Ecology, the curricula lead to the degree of Bachelor of Science in Human Ecology. In the Whitson-Hester School of Nursing, the undergraduate curricula lead to the degree of Bachelor of Science in Nursing. The student must complete the curriculum for the major subject chosen and must comply with the university requirements for a degree. The School Director, a faculty member, or staff Academic Advisor serves as the student's academic advisor.

SCHOOL OF AGRICULTURE

Foster Director; Professors Airhart, Bagley (Dean), Best, Greene, Stearman; Associate Professor Branson; Assistant Professors Baier, Frazier, Young; Instructor Ligon

The curricula of the School of Agriculture are designed to prepare students for careers in the increasingly complex and scientific field of agriculture. Following completion of the B.S. degree, students may also choose to enter graduate study.

The School of Agriculture offers the following curricula and undergraduate degree:

<table>
<thead>
<tr>
<th>Major</th>
<th>Areas of Concentration</th>
<th>Degree</th>
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<tbody>
<tr>
<td>Agriculture</td>
<td>10 concentrations:</td>
<td>B.S.</td>
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<td>Agribusiness Management</td>
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<td>Agricultural Communication</td>
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<td>Agricultural Education</td>
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<td>Agricultural Engineering Technology</td>
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<td>Agronomy &amp; Soils</td>
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<td>Animal &amp; Pre-Veterinary Science</td>
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<tr>
<td></td>
<td>Option I: Animal Science</td>
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<td>Option II: Pre-Veterinary Science</td>
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<tr>
<td></td>
<td>Environmental Agriscience</td>
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<td></td>
<td>Horticulture</td>
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<tr>
<td></td>
<td>Nursery &amp; Landscape Management</td>
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<tr>
<td></td>
<td>Turfgrass Management</td>
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</tr>
</tbody>
</table>

Individual curricula begin on Catalog page 100. Course descriptions begin on Catalog page 171.

AGRIBUSINESS MANAGEMENT

Agribusiness Management provides training in economics and business management principles related to production, distribution, and consumption of agricultural goods and services. Graduates enter careers in government agencies, commodity trading, communications, public relations, finance, marketing, sales, and agribusiness management.

AGRICULTURAL COMMUNICATIONS

Agricultural Communications Concentration prepares students for careers in agricultural communications and related fields. This curriculum provides an opportunity for students to combine technical agriculture with Agricultural Education, Journalism, Professional Communications, and Business Communications. Possible career areas include: agricultural information agencies; newspaper writing and editing; magazine feature writing and editing; agricultural related publications; public relations; advertising and sales; environmental reporting; and Agricultural Extension.
AGRICULTURAL EDUCATION CONCENTRATION

Agricultural Education prepares students for careers as high school agricultural education instructors, Agricultural Extension agents, and other related fields. Students learn to evaluate community needs and how to implement an educational program.

AGRICULTURAL ENGINEERING TECHNOLOGY

Agricultural Engineering Technology provides basic training in engineering and agriculture. Students are prepared to solve problems related to agricultural production and processing systems and the management and conservation of agricultural land and water resources. Graduates pursue careers in food and fiber handling and processing facilities, farm machinery sales and service, management of large mechanized farms, and other sectors of Agricultural Engineering Technology.

AGRITOURISM

Agritourism provides a cutting edge option for students looking to enter the agricultural industry or return to a home operation and increase the viability of maintaining their cultural heritage. Graduates enter careers as Agritourism enterprise managers, entrepreneurs in their own enterprise, non-formal educators serving as developers of educational activities and programs for Agritourism sites. In addition, some of our students will seek entrance into graduate school to open even more doors through Cooperative Extension and the USDA.

AGRONOMY & SOILS CONCENTRATION

Agronomy and Soils students study the complex processes of plants and composition of soil in which they grow. Areas of interest are crop science and soil science. Graduates pursue careers as agronomists; Extension agents; Natural Resources Conservation Service employees; and herbicide, fertilizer, and seed industry research and development specialists and sales representatives.

ANIMAL & PRE-VETERINARY SCIENCE

Option I, (Animal Science), deals with all phases of the livestock and dairy industry. Areas emphasized are nutrition, physiology, genetics, management technology, quality control, and environmental regulations. Graduates enter careers in farm management, Extension Service, food quality control, governmental health agencies, farm credit institutions, and agricultural sales and management. Completion of the Option II (Pre-Veterinary Science) curriculum is designed to enable a student to enter a College of Veterinary Medicine in addition to an earned B.S. degree in Agriculture with an Animal Science Concentration.

ENVIRONMENTAL AGRISCIENCE

Environmental Agriscience is an environmentally oriented curriculum that offers courses in soils, geology, ecology, hydrology, and biology in an environmental context in addition to traditional agriculture courses. Graduates in the

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Environmental Agriscience concentration could work in fields such as water quality, reclamation, and developing environmental impact statements. Environmental consulting firms, the EPA, state health departments, the Natural Resources Conservation Service, and the Agricultural Extension Service are a few examples of possible employers.

HORTICULTURE CONCENTRATION

Horticulture combines training in the biological and physical sciences with sound plant cultural practices. Training is offered in plant identification, production and handling of greenhouse and nursery crops and landscape design and management. Graduates enter careers in management, production, processing, sales, education, and governmental agencies related to the green industries.

NURSERY AND LANDSCAPE MANAGEMENT CONCENTRATION

Nursery and Landscape Management provides students an opportunity to combine agribusiness management training and horticulture training for managerial positions in the nursery and landscaping industries.

TURFGRASS MANAGEMENT CONCENTRATION

Turfgrass Management provides basic training in the science and culture of managing turfgrasses and the economics and business management principles related to the turf industry. Graduates are prepared to pursue careers in management of athletic turf, golf courses, municipal, industrial, home lawns and other types of turf and related business.

School of Human Ecology

Professor Bailey, Director; Professors Cunningham, Plant; Associate Professors Anderson, Mullens, Swafford; Assistant Professor Jolley

The discipline of human ecology is the study of the reciprocal relationships humans have with their environments--social, cultural, physical-and-home, work, leisure, community-and the interactions between the two. The purpose of the discipline is to enhance the quality of life for individuals and families. The knowledge base of the discipline integrates concepts of individual and family development, food and nutrition, textiles, apparel and merchandising, housing and furnishings, design, and consumer science. The curricula of the School of Human Ecology are designed to prepare students for careers in business, education, and service professions and/or for advanced studies. The School of Human Ecology offers the following curricula and undergraduate degree:

Major: Human Ecology

Areas of Concentration:

- Child Development & Family Relationships
- Family & Consumer Sciences Education
  - Career and Technical Education License
  - Occupational Family & Consumer Sciences Education endorsements
CHILD DEVELOPMENT AND FAMILY RELATIONS

The Child Development and Family Relationships concentration focuses on the preparation of students for careers with people across the lifespan. The employers of graduates from this program are often local, state, and national government agencies.

CHILD LIFE

The Child Life program, a gateway to the Certified Child Life Specialist (CCLS) credential, is coordinated with the Child Life Council's professional, programmatic and educational needs of the child life practitioner.

Application to the Child Life program at TTU is required and should be made in the first semester of the junior year.

There are three components of eligibility to sit for the certification examination.
1. Baccalaureate degree
2. Course work including a minimum of 10 college-level courses in child life or a related department/subject
3. Clinical Child Life Experience (480 hours under the direct supervision of a CCLS in good standing)

FAMILY & CONSUMER SCIENCES EDUCATION

Family and Consumer Sciences Education with Occupational Family and Consumer Science Education endorsements in Child Care Services, Culinary Arts, or Fashion and Fabric Services prepares students for careers as teachers in middle and high schools, as USDA Cooperative Extension Agents, and for other positions involving human services. Licensure for teaching is available; however, it is not mandatory nor necessary for those students planning to pursue careers other than teaching.

FOOD, NUTRITION AND DIETETICS

Food, Nutrition and Dietetics curriculum offers two options. In the dietetics option, the focus of the program is on training students for careers in health care, product development and testing, research, media and communication within the complete food and nutrition industry. In the food systems administration option, the focus is on training students for careers in food production and service, management opportunities in the food industry, and entrepreneurial activities.
The TTU School of Nursing has articulation agreements with Tennessee Board of Regents Community Colleges offering "Associate of Applied Science Degree in Nursing" and general education courses required for the TTU School of Nursing curriculum. The detailed agreements are available at www.tntech.edu/transfer.

When two candidates for admission are equally qualified, preference for admission to Upper Division will be given to students at TTU, to transfer students from TBR colleges, and to those who are Tennessee residents.

Candidates apply to the School of Nursing by February 1 for acceptance to the following Fall Upper Division Junior Level or June 1 for acceptance to the following Spring Upper Division Junior Level. The School of Nursing Admissions and Credits Committee implement the admission process. Candidates are required to have a minimum of 2.5 quality point average (QPA) in all university course work to compete for admission to Upper Division Nursing. Also, candidates must complete all required courses in Lower Division prior to entering into Upper Division. Conditional acceptance may be given to candidates completing required Lower Division course work prior to Upper Division entry. Admission to Upper Division Nursing is limited to space available. Students must have a valid Basic Life Support CPR Certification for Health Care Providers as part of admission to Upper Division Nursing.

Students must attain a grade of "C" or better in each required social, physical science, and nursing course.

A comprehensive overview of admission, progression, and retention policies for the program are in the School of Nursing Handbook. The Handbook can be accessed on the TTU School of Nursing web page.

The School of Nursing is fully accredited by the Commission on Collegiate Nursing Education (One Dupont Circle, Suite 530, Washington, DC 20036-1120, 202-887-6791), and approved by the Tennessee Board of Nursing. Graduates may be admitted to the examination for license to practice as registered nurses (R.N.) following successful completion of the BSN.

Registered nurses who have a diploma or associate degree and are currently licensed or eligible for licensure in Tennessee may also enter the School of Nursing for a BSN. A flexible program of study is designed for RN's that offers opportunity for part-time study or online study in a time frame that allows for continued employment. Under the Tennessee Career Mobility Plan, registered nurses who have graduated from programs accredited by the National League for Nursing Accrediting Commission at the time of their completion, have earned the grade of "C" or better in their previous nursing course work, and have been active in clinical practice during the last three years (or graduated from their nursing program within the last three years) will be awarded 33 semester hours of credit (NURS 3220, NURS 3250, NURS 3280, NURS 3360, NURS 3361, NURS 3370, NURS 3371, NURS 4000, NURS 4100 & NURS 4101) after the successful completion of 12 hours of Upper Division nursing course work (NURS 3281, NURS 3380, NURS 3465, NURS 4230). Registered Nurses not meeting these requirements will be required to complete the NLN Mobility Profile II exams.

All Upper Division Nursing students are required to complete and submit the Student Health Form that shows proof of certain immunizations required for clinical practice. Because the School of Nursing seeks to provide a reasonably safe environment for its nursing students and their patients, a student may be required during the course of the program to demonstrate physical and/or emotional fitness to meet the essential requirements of the program. Such essential requirements may include freedom from communicable diseases, the ability to perform certain physical tasks, and suitable emotional fitness. Any appraisal measures used to determine such physical and/or emotional fitness would be in compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. Upper Division Nursing students are required to purchase liability insurance and will be assessed fees for achievement tests. The School of Nursing supports and enforces the TTU drug free campus/work place policy. Criminal background checks may be a requirement for training at some affiliated clinical nursing sites. Based on the results of these checks, an affiliated clinical site may determine not to allow a student’s presence at their facility. This could result in the students’ inability to complete the program. The THA.com website has links available for requesting this check, a list of available vendors can be provided on request or the student may choose to use the vendor used by the clinical site.

Individual curricula begin on Catalog page 100. Course descriptions begin on Catalog page 171.
The College of Arts & Sciences provides a liberal arts education for all TTU students, strong major programs in more than thirty areas of study, high-quality foundational courses for students in programs outside the College, and new knowledge through faculty and student research. In pursuing this mission, the College emphasizes the skills and perspectives vital to lifelong education and decision-making in a democracy. These include critical and contextual thinking, effective communication, active learning, and proficiency with technology. Across the ten departments, many courses address one or more of the following major issues: environmental problems, the complex relations of science and society, and the coexistence of differing cultural or ethnic groups within the U.S. and around the globe.

GENERAL REQUIREMENTS FOR A BACCALAUREATE DEGREE IN THE COLLEGE OF ARTS AND SCIENCES

A student must satisfy the general university requirements for a baccalaureate degree. The departmental chairperson, or a faculty member designated by the chairperson, serves as the student's academic advisor.

MINOR

A minor for Arts and Sciences students requires the completion of 15 semester hours, including 6 upper-division hours, in a coherent program of study. The criterion of coherence may be met in either of two ways: (1) by following the minor curriculum prescribed by any department or college at TTU, so long as it includes at least 6 upper-division hours; (2) if such a minor curriculum is not available in the chosen department or college, by taking the 15 semester hours, including 6 at the upper division, in a single discipline—i.e., normally, courses with the same course prefix, but students should check with the department offering the minor before assuming this. Exception: A minor in physics will consist of at least 15 hours of coursework including PHYS 2110, PHYS 2120, PHYS 2420, PHYS 2920 and one upper division physics course. Approved interdisciplinary minors in the College of Arts and Sciences are:

Environmental Studies

Home: Department of Earth Sciences.
Advisor: Dr. Larry Knox, Kittrell Hall 201 or 103 (lknox@tntech.edu).
Preparation: Students wishing to minor in Environmental Studies must fulfill their general education science requirement by taking any two of the following courses: BIOL 1010, BIOL 1020, BIOL 1110, BIOL 1120, CHEM 1010, CHEM 1020, CHEM 1110, CHEM 1120, GEOL 1040, or GEOL 1045.

The Minor: A minor in Environmental Studies will consist of at least 15 hours of coursework, with a minimum of 6 upper-division hours, including the following: (a) HIST 2900 Environmental History; (b) One of the following: SOC 3600 - Environmental Sociology or AGBE 4120 (5120); (c) 9 additional semester hours chosen from the course list below, including at least: one course at the 3000-4000 level and two of the following areas of study: Agriculture, Biology, Chemistry, Geography, Geology, and Sociology (note: WFS is considered to be Biology). AGET 3110, AGRN 1010, AGRN 2210, AGRN 3230, AGRN 4220, AGRN 4230, BIOL 3120/WFS 3120 or BIOL 3130/WFS 3130, BIOL 4130, BIOL 4610, BIOL 4840, CHEM 3710, CHEM 4710, ENGL 4930 or ENGL 4931, GEOG 1010, GEOG 3330, GEO 4100, GEO 4150, GEO 4410, GEO 4650, GEO 4710, SOC 3600, WFS 4500.

Note: Except for Biology majors, students who did not take BIOL 1010-BIOL 1020 under "Preparation" (above) must take BIOL 3120/WFS 3120 or BIOL 3130/WFS 3130 as part of the "9 additional hours."

Professional Communication

Home: Department of English and Communications.
Advisor: Dr. Kristin Pickering, Henderson Hall 312A (kpickering@tntech.edu).
Curriculum: A minor in Professional Communication will consist of PC 2500 or SPCH 2410 and at least 12 additional hours of coursework from the following: PC 3250 Professional Communication I, PC 3700 Technical Documents in the Professions, PC 3750 Ethics in the Professions, PC 4850 Internship, PC 4970 Professional Communication II, and PC 4990 Seminar in Professional Communication.

Speech Communication

Home: Department of English and Communications, Division of Communication.
Advisor: Dr. Halina Ablamowicz, Henderson Hall 102 (hablamowicz@tntech.edu).
Curriculum: A minor in Speech Communication will consist of: SPCH 2410 or PC 2500 and at least 4 courses from the following: SPCH 3620, SPCH 3630, SPCH 3120, SPCH 3130, SPCH 3610, SPCH 4410, SPCH 4630, SPCH 4430, and LING 4440.

Web Design

Home: Department of English and Communications.
Advisor: Dr. Kristin Pickering, Henderson Hall 312A (kpickering@tntech.edu)
Curriculum: A minor in Web Design will consist of the
following courses: CSC 1070 Elementary Programming or an approved programming course, WEBD 1500 Introduction to Web Design, WEBD 2300 Web Site Design: Dynamic Sites, WEBD 4950 Advanced Web Page Design, and WEBD 4975 Seminar in Web Design.

Women and Gender Studies

Home: Department of History.
Advisor: Dr. Paula Hinton, Henderson Hall 112 (phinton@tntech.edu)
Curriculum: A minor in Women and Gender Studies requires completion of WGS 2010 and a minimum of 12 additional credit hours of course work (including 6 upper division hours) in approved courses. A minimum of 6 credit hours must be chosen from the following core courses: ENGL 4731, HIST 4350 (5350), HIST 4370 (5370), POLS 3400, and SOC 2200. (*Indicates that course may be repeated provided that topic is different each time.) The remaining 6 credit hours may include additional core courses listed above or approved courses that contain a significant focus on women and/or gender, or in which a student may individually contract with course instructor to focus on women and/or gender issues. These courses include but are not limited to the following: ENGL 4920; HIST 4360 (may be repeated if topic is different); HIST 4440 (may be repeated if topic is different); POLS 3200, 3800, 4610; SOC 2630, 2840, 4210, 4610; HON 4010; and 4900 in various disciplines. No student will receive credit toward both the major and minor from the same course. Student contracts must be approved by the instructor before the last day to add classes.

Undergraduate Curricula

The College of Arts and Sciences offers the following curricula and undergraduate degrees:

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<tr>
<th>Department</th>
<th>Curriculum</th>
<th>Concentration</th>
<th>Degree</th>
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<tbody>
<tr>
<td>Biology</td>
<td>Biology</td>
<td>Biology</td>
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<td>Cellular &amp; Molecular</td>
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<td>Environmental Biology</td>
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<td>Health Sciences Biology</td>
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<td>Wildlife &amp; Fisheries Science</td>
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<td>Fisheries Science</td>
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<td>Conservation Biology</td>
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<td>Chemistry</td>
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<td>Pure Chemistry</td>
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<td>Biochemistry</td>
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<td>a. Business Chemistry</td>
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<td>b. Environmental Chemistry</td>
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<td>c. Forensic Chemistry</td>
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<td>d. Health Sciences</td>
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<td>e. Industrial Chemistry</td>
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<td>f. Chemistry</td>
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<tr>
<td>Counseling &amp; Psychology</td>
<td>Psychology*</td>
<td>Geography</td>
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<td>Earth Sciences</td>
<td>Geosciences</td>
<td>Geography Information Systems</td>
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<td>Environmental Geology</td>
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<td>English &amp; Communications</td>
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<td>Writing/Language/Genre</td>
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<td>a. News Editorial</td>
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<td>Spanish</td>
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</table>
### History
- B.A., B.S.

### Mathematics
- B.S.

### Physics
- Traditional Physics, B.S.
- Applied Physics, B.S.

### Sociology & Political Science
- B.S.

### Interdisciplinary
- International Business and Cultures, B.S.
- Web Design, B.S.

### Pre-Professional

#### Non-Degree
- Pre-Dental Hygiene
- Pre-Dentistry
- Pre-Health Information Management
- Pre-Medical Technology
- Pre-Medicine
- Pre-Occupational Therapy
- Pre-Optometry
- Pre-Pharmacy
- Pre-Physical Therapy

Individual curricula begin on Catalog page 100. Course descriptions begin on Catalog page 171.

* The psychology curriculum is a joint undertaking of the College of Arts and Sciences and the College of Education. It satisfies the graduation requirements of the College of Arts and Sciences and leads to a degree from that College. It is administered by the Department of Counseling and Psychology, College of Education.

* The International Business and Cultures curriculum is shared by the Colleges of Business and Arts and Sciences. Jointly administered by the Department of Economics, Finance, and Marketing (Business) and the Department of Foreign Languages (Arts and Sciences), it leads to a joint B.S. degree, not a separate degree in either college.

### INTERDEPARTMENTAL PROGRAMS AND ACTIVITIES

All College of Arts and Sciences programs cross over departmental lines to bring in appropriate experiences from other disciplines. Some programs, however, require an unusually broad set of activities to accomplish their goals. The B.S. in International Business and Cultures uses the resources of two colleges in preparing students to solve complex problems in international commerce. The pre-professional programs draw from a wide spectrum of sciences, humanities, and social sciences as they prepare students for careers in medicine, law, and the allied health sciences. In addition to department-based minor programs, students can choose from several interdisciplinary minors: Women and Gender Studies, Environmental Studies, Education or Business. Finally, the Internship in Technology and Community Development adds an applied technology credential to the student’s major.

### B.S. IN INTERNATIONAL BUSINESS AND CULTURES

This joint-degree program, shared by the College of Business and the College of Arts and Sciences, is designed to prepare American and international students for the arena of international relations and trade. Track 1, designed for American students, emphasizes competence in basic and international business, a high level of proficiency in foreign languages, and solidly grounded knowledge of foreign cultures and the world business community. Track 2, designed for international students, offers specialized concentrations in American studies and aspects of American and international business cultures. The capstone course for both Tracks 1 and 2 is a domestic or international internship (IBC 4980). Track 1 students may also choose to spend a semester or year studying abroad in order to improve their foreign language proficiency and deepen their knowledge of foreign cultures.

### B.S. IN WEB DESIGN

The Web Design program focuses on the development of web-based content as a contemporary means of human communication and culture. The program focuses on its five core values: accessibility, excellence of content, innovation, organization, and usability. The program expects students to develop strong skills in both communication as well as the technical skills to be able to deliver their message effectively.

### PRE-PROFESSIONAL PROGRAMS

The College prepares students for professional training in law, medicine, dentistry, and other health sciences. All the courses required or recommended for pre-professionals are annually revised and updated to make certain students are
Tennessee Technological University

well-prepared and are competitive on required aptitude tests (DAT, LSAT, MCAT, OAT, PCAT, VCAT). Among the many opportunities for active learning related to pre-professional studies are: the mock-trial team, speech and debate teams, internships and work experiences, and pre-professional student groups, such as the Chem-Med Club, which provide trips to professional schools and interactions with other pre-professional students and with prominent practitioners in the various fields. Should a student later decide not to pursue entrance to a professional school, TTU offers a wide range of degree options that capitalize on the pre-professional work already accomplished.

PRE-LAW

Pre-law students have no fixed requirements, but law schools recommend they major in a discipline known for its rigor in analytical thinking and communication. Pre-law students are advised by a team of professors—in Business, English, History, Political Science, and Sociology—led by Associate Professor Lori Maxwell (lmmaxwell@tntech.edu) of the Sociology and Political Science Department.

PRE-PROFESSIONAL HEALTH SCIENCES

The pre-medicine, pre-dentistry, pre-pharmacy, pre-optometry and pre-allied health science students must take certain courses required by the professional school while at TTU, but they can do so while pursuing almost any major. In most pre-professional health science areas, students have the option of obtaining a B.S. in Applied Chemistry from TTU after three years at TTU and one year at a professional school. Pre-veterinary students have the special option of majoring in Agriculture with a concentration in animal science. Pre-professional health science students are advised by Professors Kline (ekline@tntech.edu) and Banks (tbanks@tntech.edu) in the Chemistry Department. Pre-veterinary students are advised by Professor Bruce Greene (bgreene@tntech.edu) in the School of Agriculture.

PRE-DENTISTRY, PRE-MEDICINE, AND PRE-OPTOMETRY CURRICULA

Completion of one of these three-year programs meets the requirements for admission to professional school but does not guarantee entrance. Admission into any professional school is competitive.

PRE-PHARMACY

Students who wish to apply for admission to pharmacy school at the close of the junior year should complete the Pre-Pharmacy curriculum.

The Doctor of Pharmacy degree may be obtained at an accredited college of pharmacy in four additional years after completing this three-year curriculum in prepharmacy and being accepted for admission. See preprofessional advisors for specific requirements at other pharmacy schools.

PRE-ALLIED HEALTH SCIENCE CURRICULA

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In addition to the pre-professional curricula offered in medicine, dentistry, optometry and pharmacy, Tennessee Technological University also offers preprofessional programs in auxiliary or paramedical specialties of the health professions, including medical technology, dental hygiene, physical therapy, health information management, and others. Students who wish to apply for admission to an allied health professional program without a degree from Tennessee Technological University should follow one of the programs listed under the pre-professional programs and consult with a pre-professional health science advisor. These programs closely fit requirements of most professional schools. Students desiring a Bachelor of Science degree from a professional school should plan to meet the requirements of that professional school.

INTERNSHIP IN TECHNOLOGY AND COMMUNITY DEVELOPMENT

This internship program is designed for the student who is completing a bachelor's degree program that does not include a significant application of current computer technologies to "real-world" problems and needs. During three of the student's last four semesters in a major program in the College of Arts and Sciences at Tennessee Tech, he or she will register for CAS 4910, CAS 4920, and CAS 4930, in that order, for one semester each, and not simultaneously. A certificate is awarded upon completion of all three courses, each with a passing grade.

GRADUATE PROGRAMS

Graduate curricula lead to the Master of Science degree in biology, chemistry, computer science and mathematics, the Master of Arts degree in English, and the Doctor of Philosophy degree in Environmental Sciences. For details, consult the TTU Graduate Studies office.

TEACHER LICENSURE

Students may major in the College of Arts and Sciences and work towards teacher licensure, although in some cases they may be required to earn more than 120 hours. For more information consult the College of Arts and Sciences web page: www.tntech.edu/cas/.

Student Success Center

Edith Duvier, Director/Advisor
Advisors: Deborah Allen, Angela Clark, Gina Mattingly

The Student Success Center serves undergraduate students who are in General Curriculum, General Health Studies, and General Pre-Law. The Center is especially committed to helping students succeed in general education courses and basic major requirements, choose appropriate degree programs and career paths, and helping solve problems that could cause students to be unsuccessful academically.
Tennessee Technological University

General Curriculum (GECU) is for students uncertain about their career goals or not quite ready to declare a major. The goal of the program is to help students make an educated decision in choosing their major or future career. They will receive one-on-one advising and guidance, assistance in career exploration, and academic support while selecting their majors and future careers. Students may stay in GECU until they earn 60 semester hours. However, a student may transfer to an academic department upon the request of the student and consent of his or her advisor.

General Health Studies (GHS) is for students who plan to enter nursing or one of the medical professions. Students will receive career counseling and begin fulfilling their general education requirements while preparing for their chosen career.

General Pre-Law (GEPL) is for students who are planning on entering law school after graduation from the University. Advisors aid students in selecting a major that will prepare them for their future careers. Students are also encouraged to join the Pre-Law Club where they will meet other students with similar interests in law.

### GENERAL CURRICULUM (GECU) AND GENERAL PRE-LAW (GEPL)
(The following first-year curriculum is recommended for students who are in the process of selecting a specific major.)

<table>
<thead>
<tr>
<th>Course</th>
<th>sem hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>3-5</td>
</tr>
<tr>
<td>Natural Science</td>
<td>8</td>
</tr>
<tr>
<td>Social/Behavioral Science</td>
<td>6</td>
</tr>
<tr>
<td>Humanities</td>
<td>6</td>
</tr>
<tr>
<td>UNIV 1020 First-Year Connections</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

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1. Course selected in consultation with academic advisor.
2. Select from the following: ASTR 1010, ASTR 1020; BIOL 1010, BIOL 1020; BIOL 1110, BIOL 1120; BIOL 2010, BIOL 2020; CHEM 1010, CHEM 1020; CHEM 1110, CHEM 1120; GEOL 1040, GEOL 1045; PHYS 2010, PHYS 2020; PHYS 2110/PHYS 2111, PHYS 2120/PHYS 2121. Students should confer with an academic advisor regarding the specific course selection.
3. Select two Social/Behavioral Sciences courses from the approved list at: http://www.tntech.edu/ugcurricula/general-educationcore/.
4. Select two Humanities/Fine Arts courses from the approved list at: http://www.tntech.edu/ugcurricula/general-educationcore

### GENERAL HEALTH STUDIES (GHS)

General Health Studies students may pick up an advising sheet for their particular area of interest in the Student Success Center in Henderson Hall, room 202.

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### Department of Biology

Professor Combs, Chairperson; Professors Andrews, Ballal, Berk, Bettoli, Cook, Goss, Harris, Layzer, Mattingly, Morgan, Redding, Roberts; Associate Professors Brown, Gunderson, Hayslett; Assistant Professors Carter, Willard

Courses in biology are for students who plan to pursue a major in the field of biology or wildlife and fisheries science; for students who plan to enter medical school, dental school, nursing school, or schools of medical technology; and for students in other fields of study who desire to develop a scientific attitude and to acquaint themselves with the phenomena of living organisms.

Students who plan to continue the study of biology on the graduate level or to prepare for industrial or governmental positions in the field should complete the Biology Curriculum. Curricula preparatory to the study of Medicine, Dentistry, and Medical Technology are given on preceding pages.

Tennessee Technological University is affiliated with the U.S. Geological Survey, the Tennessee Wildlife Resources Agency, and Tennessee Technological University. A primary function of the unit is to strengthen the graduate fisheries program; however, undergraduates interested in fisheries biology often find opportunities for valuable experience through association with Unit activities.

### Department of Chemistry

Professor Boles Chairperson; Professors Ensor, Glinski, Harwood, Jackson, Kline, Lisić, Northrup, Wells; Associate Professors Albu, Crouse, Swartling, Zhang; Assistant Professor Callender; Instructor Rust

Within the major in Chemistry, the Department of Chemistry offers three concentrations leading to a Bachelor of Science Degree:

1. The Pure Chemistry concentration is intended to prepare students for both graduate school and a career as a professional chemist. This concentration exceeds the requirements for certification by the American Chemical Society.
2. The Applied Chemistry concentration is composed of the 6 options outlined below:
   a. Business Chemistry – This option is intended for those who are more interested in the business side of the chemical industry or in a management career in a technical industry. The non-chemistry component of this option includes most, if not all, of the coursework necessary to enter the +1 MBA program offered by the TTU College of Business.
   b. Environmental Chemistry – Chemistry plays a central role in all environmental issues. No
student can be considered prepared to contribute to this field without a solid background in chemistry. This option incorporates a significant amount of supporting coursework in contributing sciences, such as biology, agriculture, and geology.

c. Forensic Chemistry – Forensic science is an interdisciplinary field incorporating aspects of chemistry, biology, and physics. While it is certainly an area of current popular interest, it has long been a career pathway for chemistry graduates, whose curriculum fits these demands particularly well. This option combines the essential elements of chemistry with supporting coursework in biology and criminal justice.

d. Health Sciences Chemistry - This option provides a four-year content degree in chemistry for students who have pursued non-degree curricula in pre-medicine, pre-dentistry, pre-pharmacy, pre-optometry and other related pre-health programs. Supporting coursework in biology is chosen from those courses required or encouraged by professional schools.

e. Industrial Chemistry – This option is intended for students who wish to pursue a technical career in a chemistry-related industry. Many companies seek employees with a chemical background but do not need the rigorous training found in the ACS Chemistry concentration. An integral part of this program is a minimum of one year of cooperative employment experience.

f. Chemistry – This option maintains the flexibility of the current program, allowing adaptation to new areas of interest as they develop.

3. The Biochemistry concentration is intended to serve pre-professional students and those who wish to pursue graduate work at the chemistry-biology interface.

A.C.S. certification is also possible in the Applied and Biochemistry concentrations by taking a number of additional courses beyond those listed in the catalog curricula.

Pre-Professional Programs

FOR DEGREE PROGRAMS - SEE APPLIED CHEMISTRY

Students who intend to obtain a baccalaureate degree and major in a pre-health science program should see the curriculum for Chemistry, Applied Chemistry Concentration. Pre-professional programs are designed to satisfy minimum requirements for admission to professional schools. Some students complete only these minimum course requirements prior to seeking admission to the professional school; some students enroll in degree programs such as biology, chemistry, engineering, physics, or others, and also take courses to complete the minimum professional school requirements because many of the courses satisfy requirements in both programs. In the case of pre-law, there is no specific degree required; therefore, students interested in law usually pursue a bachelor's degree in a field of their interest such as history, political science, or some area of business.

Program Name

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Dental Hygiene</td>
<td>2 years</td>
</tr>
<tr>
<td>Pre-Dentistry</td>
<td>3 years</td>
</tr>
<tr>
<td>Pre-Health Information</td>
<td>3 years</td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>Pre-Medical Technology</td>
<td>2 years</td>
</tr>
<tr>
<td>Pre-Medicine</td>
<td>3 years</td>
</tr>
<tr>
<td>Pre-Occupational Therapy</td>
<td>2 years</td>
</tr>
<tr>
<td>Pre-Optometry</td>
<td>3 years</td>
</tr>
<tr>
<td>Pre-Pharmacy</td>
<td>2 or 3 years</td>
</tr>
<tr>
<td>Pre-Physical Therapy</td>
<td>3 years or B.S. degree</td>
</tr>
</tbody>
</table>

Department of Earth Sciences

Associate Professor Harrison, Chairperson; Professors Knox, Leimer, Li, Mills; Associate Professor Hart

The aims of the Department of Earth Sciences are:

1. To provide an education in modern geologic fundamentals that will allow B.S. graduates of our geosciences program to successfully pursue advanced degrees or enter the professional geologic workforce immediately after graduation.

2. To increase general awareness and understanding of geology and geography in relation to the environment and human society.

3. To carry out research in faculty specialties in order to promote faculty currency and to provide research experiences for undergraduates.

Department of English and Communications

Professor Kemp, Interim Chairperson; Professors Ablamowicz, Armistead (Provost and Vice President for Academic Affairs), Burduck, Christianson, Creter, Eisen (Interim Associate Dean), Kash, Laird, McQuail, McRae, Null, O'Rourke, Pickering, Saya, Stewart, Viera, Weidner, Witcher; Associate Professors Baker, Ding; Assistant Professors Cloutier, Jung, Wilson; Instructors Christen, Fisk, Golz, Kilgore, Robinson, Smith

ENGLISH

The English language and literature curriculum is designed to improve students' skills in writing, critical reading, and thinking; to enrich their cultural experience; and to prepare them for all professions requiring a high level of expression, imagination, and intellectual activity, including creative writing, editing, teaching, law, politics, and management.

The English major includes four concentrations: Literature, Writing, Professional Communication, and Dramatic Arts. All
COMMUNICATION

With concentrations in Journalism and Speech Communication, the Communication major produces graduates who understand the powerful role of communication in all aspects of society. The Journalism curriculum prepares students for a variety of employment opportunities in the mass communications and media professions, primarily in the print media and public relations as well as corporate communication. The program stresses practical experience. The student newspaper, yearbook, and radio station, and the regional PBS-affiliate television station are integrated with class work, and students are encouraged to participate in the internship or co-op program. The concentration in Speech fosters the understanding of the process and practice of communication among individuals, groups, organizations, and cultures. Emphasis is on effective and ethical communication skills for success in virtually all kinds of speaking situations. Students may participate in speech and debate team activities. Upon graduation they are ready to begin careers in business, government, law, education, politics, social and human services, international relations and negotiations, or further study on the graduate level.

Department of Foreign Languages

Professor Laurila, Chairperson; Associate Professors Burdette, Hays; Assistant Professors Baker, Barnard, Groundland; Instructor Haynes

The foreign language curriculum is designed to give training in the language, literature, history, and customs of the peoples whose language is studied; to provide insights into the various means of organizing thought and reality by native speakers of the language; to enable students to understand the history and development of their own language; to provide the appropriate background for graduate studies in foreign languages; and to train students for various careers in which knowledge of other cultures and languages is needed. The Department offers two options. Option one is designed for students seeking a major in Foreign Languages with a concentration in French, German, or Spanish. Although a minor is not required, it is strongly recommended, especially for students who plan careers in teaching, government service, or other language related areas. Option 2 is designed for students who are concurrently earning a B.S. degree in engineering, industrial technology, computer science, mathematics or the physical or biological sciences. The B.S. degree in World Cultures and Business combines economics, finance, management and marketing with language study.
Tennessee Technological University

program allows undergraduate students to begin graduate mathematics coursework during their senior year.

Students planning to major in mathematics should complete 4 years of mathematics in high school, including algebra, geometry, trigonometry, and precalculus mathematics.

Department of Physics

Professor Robinson, Chairperson; Professors Ayik, Kozub, Murdock, Semmes (Interim Dean), Shriner; Associate Professor Engelhardt

The Physics Curriculum is designed to accommodate students with a variety of goals: those who wish to prepare for graduate study leading to advanced degrees in physics, those who plan to do graduate work in another field of science or engineering, and those who intend to seek employment immediately after receiving the baccalaureate degree. The basic science background and analytical thinking skills acquired by taking physics courses, combined with the broad knowledge base which characterizes all Arts and Sciences degree programs, has proved to be excellent preparation for a wide variety of careers. This includes endeavors previously viewed as "non-scientific," as virtually all walks of life have been engulfed by the current technological revolution.

Students preparing for graduate study in physics will normally follow the Option I program. The others will follow an approved Option II program which contains, in addition to a solid core of physics courses, a concentration of electives in another area of science and/or engineering, such as electrical engineering, molecular biology, or computer science. Both programs lead to the Bachelor of Science degree in physics. Students in both options are eligible for summer employment in one of the research groups in the Department, for physics scholarships, and for participation in the Cooperative Education Program.

PSYCHOLOGY
(Leading to the Bachelor of Science Degree)

The psychology program is a joint undertaking of the College of Arts and Sciences and the College of Education. It satisfies the graduation requirements of the College of Arts and Sciences and leads to a degree from that College. It is administered by the Department of Counseling and Psychology, College of Education.

Department of Sociology and Political Science

Professor Raymondo, Chairperson; Professors Gunter, Haynes, Mannle, Maxwell, Neapolitan; Associate Professors Norris, Stanger

The Department of Sociology and Political Science offers a Bachelor of Science degree in Sociology; a concentration in Criminal Justice within the B.S. Sociology degree; a concentration in Social Work within the B.S. Sociology degree; undergraduate minors in Criminal Justice, Political Science, Philosophy, Anthropology, and Sociology; and a graduate minor in Sociology.

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Political Science

A Bachelor of Science Degree in Political Science is offered with courses in each of the six main areas of specialization within the discipline: International Relations, Comparative Politics, Political Theory, American Government, State and Local Government, and Public Administration. A student who majors in Political Science at Tech is provided a broad liberal arts education with adequate specialization in the major and ample opportunity to take elective courses in related areas. Graduates are well-prepared for a number of options: graduate studies, law school, employment in government or private business.

Anthropology

Cultural Anthropology courses are offered when staff are available.

Sociology

The Sociology curriculum has three main purposes: (1) to aid students in understanding the roles of social forces and ideas in shaping modern society; (2) to provide a well-rounded education preparing the student for a wide range of occupations, particularly those which work directly with people or with categories or groups of people; and (3) to provide a sound academic background for graduate study in sociology or for such professions as law or the ministry.

Criminal Justice

Advisor: Dr. Mannle

The Criminal Justice Program offers a baccalaureate (B.S.) concentration, and a minor (15 hours) in criminal justice. The B.S. concentration involves a major in Sociology with a large proportion of course work in criminal justice.

Those who complete the B.S. degree will have a sound foundation that prepares them to compete for positions in law enforcement, corrections and social service agencies, or for admission to law school.

Social Work

The Department of Sociology and Political Science offers a social work concentration for those students interested in a career in social work.

Social work is a "helping profession" that assists people who face difficult problems. Some social workers do their work in family service agencies dealing with marriage, health and child welfare problems. Others work in a medical setting providing assistance to patients and their relatives during a health crisis or a death. Still others work in the area of corrections assisting juvenile and adult law violators in rehabilitation. Social workers can also be found in public welfare agencies assisting the poor and disabled and in industry assisting employees with chemical abuse problems.
Philosophy

Philosophy courses are designed to help students acquire appreciation for the values and modes of reflection appropriate for the philosophical mind. They seek to stimulate interest in the ultimate human questions and to help students understand the proposed answers to those questions given by thinkers across the centuries. A baccalaureate minor is available and is especially appropriate for those interested in the humanities, the social sciences, and the professions.

Sociology Major

The Sociology Major at Tennessee Tech University leads to the Bachelor of Science Degree and includes three tracks: a Bachelor of Science in Sociology; a Bachelor of Science in Sociology with a concentration in criminal justice; and, a Bachelor of Science in Sociology with a concentration in social work.

Core of Required Courses Common to the Major (all three tracks): (27 hours)

SOC 1010 Introduction to Sociology
SOC 3100 Sociological Theory
SOC 3900 Introduction to Social Research
SOC 3910 Social Science Statistical Analysis
SOC 4200 (5200) Data Analysis and Management or
SOC 4930 (5930) Field Research Methods
Foreign Language (3) (Culture and Civilization courses do not quality)
Electives in Social Sciences/Philosophy (9)

Students will take 9 hours of elective courses in the social sciences/philosophy consisting of any course that meets the Social/Behavioral Sciences General Education Requirement, and/or are from the disciplines of: anthropology, criminal justice, economics, geography, philosophy, political science, psychology, social work, or sociology.

Note: For the criminal justice concentration 3 hours of the electives in Social Sciences/Philosophy must be at the upper division level. The social work concentration meets the Social Sciences/Philosophy requirement by 9 hours embedded in the major (PSY 2010, PSY elective, and PHIL 2250).

Additional graduation requirements must be satisfied including but not limited to: a total of 120 semester hours; a total of 36 hours earned at the upper division (3000 or 4000 level courses); and, satisfactory completion of the general education requirements. Students are responsible for ensuring that they meet all requirements for graduation, and should consult with their academic advisor on a regular basis.

To complete the general sociology track:

In addition to the required core of 27 hours, students will complete an additional 21 hours of elective courses chosen from courses with a sociology, criminal justice, or social work prefix. A minimum of 15 hours must be at the upper division level.
Total hours in the major: 48.

Total hours of sociology/SW/CJ courses: 36-45.
Total hours required for graduation: 120.

To complete the criminal justice track:

In addition to the required core of 27 hours, students will also be required to take:

CJ 2660 Criminology
CJ 2700 Introduction to Law Enforcement
CJ 2850 Criminal Law and Procedure
CJ 3610 Criminal Justice Administration
CJ 3650 Juvenile Delinquency
CJ 4660 (5660) Corrections
PHIL 1030 Introduction to Philosophy
POLS 1000 American Government

General Education Science requirement must be met by BIOL or CHEM sequence.

Students will compete an additional 12 hours of elective courses at the upper division level chosen from courses with a sociology, criminal justice, or social work prefix.
Total hours in the major: 63
Total hours of sociology/SW/CJ courses: 45-54.
Total hours required for graduation: 120.

To complete the social work track:

In addition to the required 27 hours, students will also be required to take:

SW 1800 Introduction to Social Work
SW 4100 (5100) Probation and Parole
SW 4120 (5120) Case Management
SW 4900 (5900) Internship
PHIL 2250 Introductory Ethics
POLS 1000 American Government
PSY 2010 General Psychology
PSY Additional Course (3)

General Education Science requirement must be met by BIOL sequence.

Students will complete an additional 15 hours of elective courses chosen from courses with a sociology, criminal justice, or social work prefix. A minimum of 9 hours must be at the upper division level.
Total hours in the major: 57.
Total hours of sociology/SW/CJ courses: 42-51.
Total hours required for graduation: 120.

Political Science Major

The Political Science major at Tennessee Tech University is part of a 120 hour degree program which includes: requirements for the major; requirements of the general education component of the curriculum; and, elective hours. At least 36 of the 120 hours required toward the degree must be
at the upper division level (courses numbered at the 3000 or 4000 level).

The departmental requirements for the major consist of a total of 54 hours including:

- POLS 1000 American Government
- POLS 1100 Introduction to Political Science
- Electives in Political Science (24)
- Foreign Language Credit 6. (At least 3 hours must be in a language course. The other 3 hours may be in language or in a culture related course.)
- Computer skills–
  - DS 2810 Computer Applications in Business or
  - CSC 1100 Introduction to Computing
- History–upper division course (6)
- Social Science, Criminal Justice, or Philosophy Electives (6)
- English-upper division course (3)

Total departmental requirements for the major: 54 hrs
James Jordan-Wagner, Dean  
, Associate Dean

PHILOSOPHY OBJECTIVES

The mission of the TTU College of Business is to excel in preparing students for business and business-related careers by blending scholarship and business experience in quality undergraduate programs and a case-oriented MBA program.

The College's highest level of dedication is to its academic program exemplified by its focus on excellence in instruction, which is supported by a commitment to scholarly activity and intellectual contribution by the faculty and interaction with business and industry. We believe that teaching, research, and service are interdependent components of our mission. The following values guide us in striving for excellence in these areas identified in order of relative emphasis:

1. Teaching--We encourage our faculty to be sensitive to the educational needs of our students and to strive for excellence in teaching skills and content.

2. We seek to educate business leaders and potential leaders who are capable of making lasting contributions to business and society and who are also skilled in using an interdisciplinary approach to decision making in an increasingly global and technology-dependent business environment.

3. Intellectual Contributions--We encourage our faculty to engage primarily in applied research and scholarly activities that provide insights into business practice. We believe such scholarly activity should be a career-long endeavor of faculty engaged in educating current and future business leaders and that such activity enhances the effectiveness of classroom instruction and external interaction.

4. Service--All members of the business school faculty are encouraged to share their expertise to benefit external constituencies and to offer opportunities for students and faculty to apply their skills and knowledge. We believe these activities and involvement with business and government leaders significantly increase the abilities of faculty to deliver current information in the classroom and that they build important bridges between the academic community and our external constituencies.

We encourage professional and service endeavors that strengthen relationships with the broader academic community--activities within this University, interaction with other universities, and involvement in professional organizations.

The College offers the B.S.B.A. degree that is structured on a firm base of liberal education courses, a core area of business studies, and an area of specialization. We seek to prepare students from culturally diverse backgrounds for careers in business. In the degree, the College seeks to:

1. Develop an analytical approach to sound business decisions.
2. Develop understanding and appreciation of the social, ethical, legal, political, and economic environment of business.
3. Promote appreciation of the civic and social obligations of business managers.
4. Develop understanding and appreciation of business in its international context.

5. Equip students to respond to the demands of business in a changing technological environment.
6. Create a professional attitude and provide the foundation for professional competence in a chosen career specialization.

The business program includes studies in three major categories: general education, the business core, and a major field of specialization. The core courses and the distribution of credit hours for the three categories of studies are listed as follows:

**Category** | **sem. hrs.**
--- | ---
**General** | 60
ECON 2010, 2020; 3320 or 3810 or 3820 | 9
ENGL 1010, 1020 | 6
HIST 2010, 2020 | 6
MATH 1130, 1830 | 6
**Laboratory Science** | 8
(8 semester hours selected with advisement from ASTR, BIOL, CHEM, GEOL, or PHYS) | 8
SPCH 2410 or PC 2500 | 3
Humans(1) | 9
**Non-business Electives** | 13
**Business Core** | 36
ACCT 2110, 2120 | 6
BMGT 3510, 4930 | 6
DS 2810, 3520, 3620, and 3840/3841 | 12
ECON 3610 | 3
FIN 3210 | 3
LAW 3810 | 3
MKT 3400 | 3
**Major Field of Specialization** | 21
Accounting | 
Business Management or Decision Sciences | 
Economics | 
Finance | 
Marketing | 
**Business Electives** | 3
Total Required for Graduation | 120

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1 Select from the approved list of TTU General Education courses in Humanities/Fine Arts.
2 Elective courses are to be selected in consultation with the academic advisor.
3 Business students may not take business courses on a pass/fail basis.
4 Business majors must complete at least 50% of the upper-division hours required in the major field of specialization at Tennessee Technological University.
5 Business majors must take 50% of the total hours required for the degree in courses offered outside the College of Business and the remaining 50% of the total hours required for the degree in courses offered by the College of Business. For this purpose, ECON 2010, 2020, and 3320 or 3810 or 3820 are included in the non-business component.
6 Business majors must earn at least 50% of the business hours required for the degree at Tennessee Technological University.
ADMISSION

See Admission for requirements for admission to the University.

COB RETENTION POLICY

Any student majoring in the College of Business must have a cumulative QPA of at least 2.0 upon reaching junior status (60 hours) to be eligible to enroll in upper-division (3000- and 4000-level) courses.

A student who does not meet these requirements must make a reasonable effort, in consultation with the advisor, to repeat 1000- and 2000-level courses as soon as the courses are next offered to bring the QPA to a 2.0.

Having met these requirements, the student must maintain at least a 2.0 overall average, as well as a cumulative 2.0 in all business courses.

A student who does not maintain these averages for any two consecutive semesters after becoming a junior will be required to repeat upper-division courses to raise the average to the required level.

All repetition of courses shall be in accordance with the university policy governing course repetition as described in this Catalog.

DIVERSITY PROGRAM

The College of Business administers a diversity scholarship endowment designed to encourage individuals of diverse backgrounds to enter the College and pursue careers in business.

REQUIREMENTS FOR DEGREE

Each curriculum in the College of Business leads to the degree of Bachelor of Science in Business Administration. To obtain a degree, the student must complete the curriculum for the major subject chosen and comply with the general requirements of the University. Advisors in the COB Student Success Center serve as academic counselors for the first two years or until Basic Business requirements have been completed. The department chairperson, or a faculty member designated by the chairperson, serves as the student’s academic advisor for the junior and senior years.

At least 50 percent of all business credit hours and 50 percent of upper-division hours in the major must be earned at Tennessee Technological University.

PRE-LAW

The pre-law student may complete the requirements for a degree in any curriculum of the College of Business with a major in accounting, business management, economics, finance, marketing, or International Business and Cultures (joint degree with the College of Arts and Sciences). A college degree and a satisfactory score on the Law School Admission Test are generally required for admission to an approved law school. The pre-law program in business is designed to supplement departmental counseling and to assist the student in planning a program for a career in law. The pre-law advisor provides the information relevant to professional law programs, admission requirements, and standards.

B.S. IN INTERNATIONAL BUSINESS AND CULTURES

This joint-degree program, shared by the College of Business and the College of Arts and Sciences, is designed to prepare American and international students for the arena of international relations and trade. Track 1, designed for American students, emphasizes competence in basic and international business, a high level of proficiency in foreign languages, and solidly grounded knowledge of foreign cultures and the world business community. Track 2, designed for international students, offers specialized concentrations in American studies and aspects of American and international business cultures. The capstone course for both Tracks 1 and 2 is a domestic or international internship (IBC 4980). Track 1 students may also choose to spend a semester or year studying abroad in order to improve their foreign language proficiency and deepen their knowledge of foreign cultures.

MASTER OF BUSINESS ADMINISTRATION

The MBA is intended for business and non-business undergraduate majors and experienced managers. For details of the MBA program, see the Bulletin of the Graduate School.
The College of Business includes the following departments, which offer curricula as follows:

<table>
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<tr>
<th>Department</th>
<th>Curriculum</th>
<th>Concentrations</th>
<th>Degree</th>
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<tbody>
<tr>
<td>Accounting</td>
<td>Accounting</td>
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<td>B.S.</td>
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<tr>
<td>Decision Sciences &amp; Management</td>
<td>Business Management</td>
<td>1) General Management</td>
<td>B.S.</td>
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<td>2) Human Resource Management</td>
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<td>3) Production &amp; Operations Management</td>
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<td>4) Management Information Systems</td>
<td>B.S.</td>
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<tr>
<td>Economics, Finance &amp; Marketing</td>
<td>Economics</td>
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<td>Finance</td>
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<td>Marketing</td>
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<td>B.S.</td>
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<tr>
<td></td>
<td>International Business and Cultures</td>
<td></td>
<td>B.S.</td>
</tr>
</tbody>
</table>

Individual curricula begin on Catalog page 100. Course descriptions begin on Catalog page 171.

Student Success Center
Julie Galloway, Director/Advisor

Advisors: Sarah Khleif, Katharine Kumar, Rebecca Leimer
Program Manager: Amy Jo Carpenter

Mission Statement: To support, guide, and empower students for academic and social success in their college, professional and life experiences.

All students entering into the College of Business are initially admitted as Basic Business majors and receive support services through the College of Business Student Success Center. The Center offers academic advising to Basic Business majors to ensure that preparation for upper-division students is both thorough and properly sequenced. Freshmen who begin their studies at TTU, as well as those students who transfer to the College from other majors or from other schools, are advised by the Center.

The Center also offers workshops, seminars, and special events through the Student to Career program. The purpose of the Student to Career program is to provide programming that enhances the academic and social elements of our student's college experiences as they transition from business student to business professional. Students participate in resume and interview workshops, dining etiquette training, and special events including career fairs.

The Basic Business curriculum is structured as two-years of full-time study and is the required foundation curriculum for all business majors. Transfer credits are evaluated and applied as appropriate.

Students satisfactorily completing the Basic Business program may affiliate with an upper-division major. Students must complete at least 60 semester hours, including mathematics, English, science, history, humanities, communications and all required sophomore-level business courses, with at least a 2.0 quality point average (QPA). Students should apply for affiliation with the upper-division major through the COB Student Success Center during the last semester of the sophomore year.

Transfer students remain in the division until they complete the required program. If their evaluated transcripts reveal that they have the necessary credits and QPA, they may affiliate with a major immediately. Basic Business students must complete the required program of studies before enrolling in upper-division business courses.

DEPARTMENT OF ACCOUNTING
Professor Fesler, Chairperson; Professors Caldwell, Earles, Elmore, Maples, Rand; Associate Professor Seay; Assistant Professor Howard

The objective of the accounting program is to provide the educational foundation for careers in accounting. The program includes both general and special education. Courses in the arts, sciences, and business areas are required. A wide variety of accounting courses provide flexibility for different accounting specialities. The curriculum is designed to help students gain initial employment and successfully advance in such specializations as public accounting, internal auditing, taxation, and business and industrial accounting. The accounting program contains courses to meet all requirements of the state's 150-hour law for CPA candidacy.

DEPARTMENT OF DECISION SCIENCES AND MANAGEMENT
Professor Armstrong, Chairperson; Chairs of Excellence Guimaraes (J.E. Owen Chair of Excellence in Management Information Systems), Reimann (W. Eugene Mayberry Chair of Excellence in Quality and Technology Management); Professors Bell (President), Miller, Natarajan (W. Eugene Mayberry Professor of Management), Timmerman, Wells; Associate Professors Barger, Huguenard, Jones, Matson, Pineda; Assistant Professor Ballou

The department offers the Business Management major with a choice of four options: General Management (BUMA); Human Resource Management (BUHR); Production/Operations Management (BUHR); and Management Information Systems (BUIN).

The General Management option is designed for the student desiring broad managerial expertise and curriculum exposure to a variety of business areas. This program is
characterized by an emphasis on advanced organizational management skills.

The Human Resource Management option prepares students for career opportunities in human resource management in both the public and private sector. The curriculum focuses on conflict management and negotiations, leadership and employee development, compensation administration, and employment practices.

The Production/Operations Management option is designed to prepare graduates for careers in effective operations management, with a focus on analytically based decision making and the improvement of quality and productivity. Characteristic of this option is the emphasis on the management of the resources, processes, and technologies used to create goods and services in both manufacturing and non-manufacturing environments.

The Management Information Systems option is designed to prepare students for various careers in the area of business information systems. The curriculum is characterized by an emphasis on analytical methods for business problem solving, information technology applications, and business systems design and implementation.

In addition to offering the four options of study, a primary mission of the department is to provide a significant amount of the core coursework in organizational behavior, analytical methods, management information systems, operations management, and business strategy, to support other undergraduate majors offered in the College of Business, as well as the graduate program in business.

The department houses two distinguished professorships in the state's program of chairs of excellence allowing universities to attract eminent faculty and individuals of national and international prominence as chairholders. In the department is the J.E. Owen Chair of Excellence in Management Information Systems held by Dr. Tor Guimaraes, a scholar of international distinction. In addition, the department has the W. Eugene Mayberry Chair of Excellence in Quality and Technology Management held by Dr. Curt Reimann, senior scientist emeritus of the National Institute of Standards and Technology and retired director of the Malcolm Baldrige National Quality Award. This distinguished position is named in honor of Dr. W. Eugene Mayberry, retired chairman of the board of governors of the Mayo Clinic.

DEPARTMENT OF ECONOMICS, FINANCE AND MARKETING
Professor Isbell, Chairperson; Professors Jonakin, Martin, Pashley, Pharr, Rappl, Stephens (Associate Vice President for Academic Affairs), Throckmorton, Wiant, Wood (Associate Dean); Associate Professors I Anitsal, DiFurio; Assistant Professor M. Anitsal

The program in economics is designed to provide a sound preparation for those who expect to pursue professional careers in economics, as well as other areas in business, and to provide service courses for non-business majors. The major emphasis is in developing an understanding of the economic environment, economic institutions, processes, and problems, as well as the basic economic models at work under a market economy.

The curriculum in finance offers a program that will assure sound preparation for those who expect to pursue professional careers in finance, as well as other business. The program is designed to provide a solid understanding of the financial
COLLEGE OF EDUCATION

Larry Peach, Interim Dean
Pat Jordan, Interim Associate Dean
Beth Mannle, Assistant Dean

ORGANIZATION

The College of Education consists of five departments—three heavily involved in the preparation of school personnel, one heavily involved in the Fine Arts and one that provides academic support to under prepared students. It is the largest graduate college.

The College also operates three college-wide divisions. A Director heads each division. These are Rural Education, Teacher Education, and Technology. The Associate Dean of the College of Education heads the Ph.D. program in Exceptional Learning.

Programs within the College are accredited by:

- National Council for the Accreditation of Teacher Education (NCATE)
- National Association for Schools of Art and Design (NASAD)
- National Association of Schools of Music (NASM)
- National Association of School Psychologists (NASP)

PURPOSES

1. Prepare caring and competent professionals in teaching, school leadership, counseling, psychology, music and art.
2. Provide a high quality preparation program for doctoral students in Applied Behavior Analysis, Literacy, Program Planning and Evaluation.
3. Ensure the success of developmental students in their majors.
4. Provide a model childhood development laboratory.
5. Provide cultural events through the Fine Arts for the Upper Cumberland, the state and the region.

ADMISSION

There are three levels of admission to the Teacher Education Program:

I. The student receives provisional admission upon meeting the admission policies of the institution. Transfer and/or readmitted students must have a 2.5 cumulative GPA. Students who do not meet this requirement but do meet general admission requirements may be admitted into non-licensure programs.

II. The student receives full admission upon meeting the following criteria:
   A. The completion of a minimum of 30 semester hours of credit, exclusive of ADP courses. The 30 semester hours must include ENGL 1010, ENGL 1020 and FOED 2011, FOED 1820/22 or the equivalent. A minimum grade of “B” or higher must be earned in all courses that are field-experiences or technology-related, or include a major field experience.
   B. The attainment of a minimum academic quality point average of 2.50.
   C. The attainment of the minimum required cut scores on the PRAXIS I (Pre-Professional Skills Test) series. The current required PRAXIS I scores are as follows: Math (173), Reading (174), and Writing (173). The PPST (PRAXIS I) may be taken as many times as necessary in order to successfully complete the entire series. The Tennessee State Board of Education has approved the following PRAXIS I exemptions for admission to Teacher Education Programs: An enhanced ACT composite score of 22 or score on the recentered SAT of 1020.
   D. Evidence of four desirable dispositions for success in teaching.
   E. A formal application filled with the Office of Teacher Education at the beginning of the first semester of attendance after the completion of 30 semester hours of credit.
   F. Acceptance by the Teacher Education Committee. The candidate must meet the standards for full admission and receive acceptance by the Teacher Education Committee before he/she is eligible to register for courses that require full admission.
   G. Criminal Background Check.

III. Admission to Student Teaching. Student teaching is the culminating professional experience in the pre-service education of teachers. Admission to student teaching, in addition to full admission to the Teacher Education Program, requires the following:
   A. A minimum cumulative QPA of 2.50;
   B. A minimum of 2.0 average in the major teaching field;
   C. All PRAXIS II tests required for the candidate’s licensure program must be attempted and passed;
   D. Completion of all course prerequisites;
   E. Minimum grade of “B” in all courses that are field experiences, technology related, or include a major field experience;
   F. Completion of the College Base Exam or currently required university exit exam. To schedule your exit exam, contact Academic Affairs, 931-372-3463.

G. STUDENT TEACHING CANDIDATES must submit a formal Student Teaching Application along with two Disposition Assessment Forms (One from a public school teacher and one from the candidate’s adviser). All documentation must be received by the Office of Teacher Education by the following deadlines:
   • Fall Semester Student Teaching
     o APPLICATION PACKET DEADLINE: JANUARY 31
   • Spring Semester Student Teaching
The College of Education includes the following departments, which offer curricula as follows:

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<tr>
<th>Department</th>
<th>Curriculum</th>
<th>Option</th>
<th>Degree</th>
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<tbody>
<tr>
<td>Counseling &amp; Psychology</td>
<td>Psychology (See College of Arts &amp; Sciences)</td>
<td></td>
<td>B.S.</td>
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<tr>
<td>Curriculum &amp; Instruction</td>
<td>Child &amp; Family Studies</td>
<td>Early Childhood Education/PreK-4</td>
<td>B.S.</td>
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<td></td>
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<td>Early Childhood/Special Education/PreK-1</td>
<td>B.S.</td>
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<tr>
<td>Multidisciplinary Studies</td>
<td>Elementary Education K-6</td>
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<td>B.S.</td>
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<td>English as a Second Language/PreK-12</td>
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<td>B.S.</td>
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<td>General (non-licensure)</td>
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<td>B.S.</td>
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<td>Middle School 4-8</td>
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<td>B.S.</td>
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<tr>
<td>Secondary Education</td>
<td>Specific Teaching Field</td>
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<td>B.S.</td>
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<td>Special Education</td>
<td>Modified</td>
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<td>B.S.</td>
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<td></td>
<td>Comprehensive</td>
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<td>B.S.</td>
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<tr>
<td>Exercise Science, Physical Education &amp; Wellness</td>
<td>Exercise Science, Physical Education &amp; Wellness</td>
<td>Athletic Training</td>
<td>B.S.</td>
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<td>Coaching and Sport Administration</td>
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<td>Fitness and Wellness</td>
<td>B.S.</td>
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<td>Licensure (K-12)</td>
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<td>Pre-Occupational Therapy</td>
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<td>Pre-Physical Therapy</td>
<td>B.S.</td>
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<tr>
<td>Music &amp; Art</td>
<td>Music</td>
<td>Music Education</td>
<td>B.M.</td>
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<td>Instrumental Licensure</td>
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<td>Vocal/General Licensure</td>
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<td>Performance</td>
<td>B.M.</td>
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<td>Composition Emphasis</td>
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<td>Instrumental Option</td>
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<td>Jazz Option</td>
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<td>Piano Option</td>
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<td>Vocal Option</td>
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<td>Fine Arts</td>
<td>Art Education</td>
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<td>B.F.A.</td>
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<td>Clay</td>
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<td>Fibers</td>
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<td>Glass</td>
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<td>Metals</td>
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<td>Painting</td>
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<td>Wood</td>
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</tbody>
</table>

Individual curricula begin on Catalog page 100.
Course descriptions begin on Catalog page 171.

In the latest year available (2004-2005), 97% of the Tennessee Tech candidates for teacher licensure passed the PRAXIS exams required in Tennessee.

EDUCATION ADVISING CENTER

Beth G. Mannle Assistant Dean/Director
Advisors: Charles Craig, Melissa Irvin, Demetria Mells

Students enrolling as freshmen or transfer students in College of Education majors (with the exception of Music and Art), enter through the Education Advising Center. The purpose of the Center is to prepare students for entry into the Teacher Education Program or complete their non-licensure degree in Exercise Science. Advisors ensure that students are properly informed of testing/licensure requirements and standards, course sequence and pre/co-requisites.

The TTU College of Education also offers its Elementary Education Licensure program on the campuses of Pellissippi State (Hardin Valley and Division Street), Roane State (Crossville, Harriman, Oak Ridge, and Scott County), McMinnville, Motlow (Moore County) and Chattanooga State. All sites are cohort based, which means that students start
**Tennessee Technological University**

Together as a class and go through the whole program together. Therefore, each site will be open for admission only once a year. Students must be admitted to TTU and to Teacher Education prior to joining the cohort. These students are also advised through the College Advising Center.

**OFFICE OF TEACHER EDUCATION**

Dr. Sandy H. Smith, Director of Teacher Education  
Ms. Elizabeth Boucher, Instructor/Coordinator of Assessment  
Ms. Precious Edmonds, Certification Analyst  
Ms. Amanda Roberts, Certification Analyst

**PROFESSIONAL FIELD EXPERIENCES**

The program of professional field experiences in the College of Education includes activities such as observation, participation, studies of individual students, and a limited amount of research, as well as student teaching or clinical experience. These experiences are provided throughout both the graduate and undergraduate programs.

- **Pre-Student Teaching Field Experiences.** Most professional field experiences in which teacher education candidates engage prior to student teaching are an important part of specific college courses. Programs in connection with area public schools give candidates opportunities to work with both teachers and pupils from early childhood through high school. Field experiences in non-school settings are also available. Activities include taped classroom exercises, observation, paraprofessional work, tutorial assistance, practice, child studies, research, and limited teaching.

- **Enhanced Student Teaching Experience.** Student teaching is an integral part of the sequence of work in professional education. Approval for student teaching indicates that the candidate has successfully met the academic, professional, and personal standards established by the Teacher Education Committee. During student teaching, the candidate spends a full semester in appropriate settings for the license sought, participating in the wide variety of instructional and non-instructional experiences which comprise the total teaching task. During this time, supervision is provided by professional mentoring teachers, administrators, and university supervisors.

- **Graduate Field Experiences.** Opportunities are provided in many graduate courses for involvement with students in school and non-school activities. Each program includes in-depth field experience identified as a practicum, field/clinical experience, or internship.

**REQUIREMENTS FOR DEGREE**

The undergraduate curricula in the College of Education lead to the degree of Bachelor of Science, Bachelor of Science in Education, Bachelor of Music, or Bachelor of Fine Arts; and the graduate curricula lead either to the degree of Master of Arts or Specialist in Education. Each candidate must complete the curriculum for the major subject or teaching field chosen and must comply with the university requirements for a degree. Candidates, regardless of the college in which enrolled, who will have completed licensure requirements as a part of the total hours required for graduation must pass the PRAXIS II Examinations which consist of the Principles of Learning and Teaching and the appropriate specialty examination(s).

The candidate may be required to meet revisions in the various curricula necessitated by changing standards of the National Council for Accreditation of Teacher Education or by requirements of the State Board of Education for teacher licensure.

The department chairperson, or a faculty member designated by the chairperson, serves as the candidate's academic advisor.

**REQUIREMENTS FOR TEACHER LICENSURE**

Recommendation by the institution is one of the requirements of the Tennessee regulations for licensure. Program completers seeking recommendation for licensure must meet the following criteria:

1. Candidates must meet all requirements for admission to the Teacher Education Program.
2. Candidates must complete the approved program of study and all requirements for the education curriculum for the grade level(s) in which licensure is sought.
3. Candidates must maintain a 2.50 overall quality point average including the major teaching field.
4. Candidates must successfully complete the culminating clinical field experience or student teaching semester.
5. Candidates must demonstrate the knowledge, skills, and dispositions in the subjects and grade level determined by the appropriate licensure standards and measured by the performance-based instruments in field and clinical experiences and the professional judgment of university supervisors and mentoring teachers.
6. Candidates must receive a grade of “B” in all courses that are field or clinical experience, technology related, or include a major field experience.
7. Candidates must complete and meet minimum scores in all state licensing examinations (PRAXIS II) required for the license sought. All candidates must submit minimum scores in the appropriate Principles of Learning and Teaching test and all applicable specialty area tests as established by the Tennessee State Board of Education.

**LEARNING RESOURCES CENTER LIBRARY**

Carl Owens, Director of Instructional Technology

The Learning Resources Center in the College of Education is a service center designed primarily to help the faculty, students, and teachers improve instruction through effective utilization of appropriate materials. It provides a large collection of educational media (hardware and software) for elementary, secondary, and professional education instruction. Faculty and student personnel are available to assist in producing, selecting, and using these learning resources.
ACADEMIC DEVELOPMENT PROGRAM

Janet F. Whiteaker, Program Leader; Associate Professor Bryant; Assistant Professors Harden, Whiteaker; Instructors Coble, Duvier, Lewald

The Academic Development Program provides students with instruction in basic skills (reading, mathematics, writing) at the developmental levels and study skills at the developmental level. Enrollment in these classes may be required by the University before a student is allowed to enroll in college-level classes.

Based upon ACT/SAT scores and test scores from the COMPASS/ASSET, students may be required to enroll in one or more classes at the pre-college (basic/developmental) level. Students needing Academic Development Program (ADP) courses must enroll in and satisfactorily complete those courses during the initial term(s) of enrollment. Students needing ADP reading courses may not enroll in courses that have an excessive amount of reading, such as: history, psychology, sociology, etc. Students needing ADP writing courses may not enroll in college-level English until the ADP writing requirement has been satisfactorily completed. Students needing ADP math courses may not enroll in college-level math, chemistry, or physics class until the ADP math requirement has been satisfactorily completed. Students may concurrently enroll in college-level courses which do not require prerequisite ADP skills. Class attendance is mandatory. Students placed and enrolled in an ADP class are not permitted to withdraw except for serious circumstances and with the permission of the program leader. A grade of "C" or higher is required for progression to the next level.

All students taking two or more developmental courses are required to take UNIV 1030 - Learning Strategies.

DEPARTMENT OF COUNSELING AND PSYCHOLOGY

Professor Stein, Interim Chairperson; Professors Cupp, Terneus, Zagumny; Associate Professors Giesbrecht-Bettoli, Wilcox; Assistant Professors Dolzycki, Foster, Loskot, Malone, Morgan

The Department of Counseling and Psychology offers the program leading to the degree of Bachelor of Science in Psychology, psychological foundations courses for teacher education, and graduate programs leading to the Master of Arts and Specialist in Education degree in Educational Psychology and Counselor Education.

The psychology program is a joint undertaking of the College of Arts and Sciences and the College of Education. It satisfies the graduation requirements of the College of Arts and Sciences and leads to the Bachelor of Science degree from that College. Consult the College of Arts and Sciences general requirements for a baccalaureate degree. Academic advisement of students is assumed by the Department of Counseling and Psychology faculty.

DEPARTMENT OF CURRICULUM AND INSTRUCTION

Associate Professor M. Smith, Interim Chairperson; Professors Akenson, Alfred, Folio, Jackson, Larimore, Owens, Talbert, Wheeler (Associate Dean); Associate Professors Anthony, Brashears, Bruckman, Clauss, Collins, Comer, Elkins, Gore, Keller, Kolodziej, J. Martin, O. Martin, Setliff, S. H. Smith, S. J. Smith, Sutters, Zagumny; Assistant Professors Baker, Chitiyo, Dainty, Graves, Pennycuff, Richards, Stepp, Watlington, Wendt

The Department of Curriculum and Instruction is responsible for preparing teachers for endorsement in one or more teaching fields or grade levels in Pre K-12 and for offering graduate work in instruction and curriculum through the M.A. and Ed.S. degrees. Licenses for teaching are available in the areas of:

- Early Childhood Education, Pre K-3 and Early Childhood Special Education, PreK-3
- Elementary Education, K-6
- English as a Second Language, PreK-12
- Middle School, 4-8
- Secondary Education (Biology, Chemistry, Earth Sciences, Economics, English, French, German, Geography, History, Mathematics, Physics, Political Science, Psychology, Sociology, Spanish, Speech Communication, 7-12, and Theatre, K-12) and Trade and Occupational Specialist specialization
- Special Education (Modified K-12, Comprehensive K-12)

The Department of Curriculum and Instruction offers graduate programs in each of the above areas as well as in the field of Curriculum Education, Instructional Leadership and Reading Education.

The Multi-disciplinary Studies Non-Licensure program is offered for students desirous of a broad-based degree and background in education but who do not desire to pursue a teaching license.

OCCUPATIONAL EDUCATION

No degree is available; however, course work is offered for the occupational teacher who must complete specific knowledges and skills to be recommended for the Occupational Education License. The program consists of the following 18 semester hours: CTE 3230, CTE 4030 (5030), CTE 4080 (5080), CTE 4090 (5090), CTE 4850 (5850), and SEED 4121 (5121).

The initial license issued is the Apprentice Occupational License. To advance from the Apprentice Level to the Professional Level, the individual must attend a three-day or 18 contact hour pre-service training for occupational teachers during the first year, earn 18 semester hours from an institution with an approved program (with six of those hours required during the first year), complete four days of observation of other teachers, have a mentor teacher, attend two days of professional development during the school year, and must teach a total of three years with positive evaluations by the local education agency.
DEPARTMENT OF EXERCISE SCIENCE, PHYSICAL EDUCATION AND WELLNESS

Professor Barfield, Chairperson; Professor Bell, Jordan (Interim Associate Dean); Associate Professor Barfield; Assistant Professor Killman; Instructor Smith

The primary goal of the Department of Exercise Science, Physical Education and Wellness is to prepare future professionals in the fields of teaching, coaching, fitness, wellness and rehabilitation. The secondary goal is to help students understand the benefits of a physically active lifestyle and to develop healthy behaviors for life.

With a degree in Exercise Science, Physical Education and Wellness, one can:
- Teach lifetime wellness in public schools
- Teach physical education K-12
- Coach or be a sport administrator
- Work in or lead a fitness and wellness program in a corporate, hospital or private setting
- Continue their education towards licensure as a physical therapist or an occupational therapist

Students intending to major in Exercise Science are expected to exhibit a healthy level of physical fitness. All majors must take and satisfy the requirements of a departmental Physical Fitness exam annually. Failure to pass this exam will result in an administrative change of major.

DEPARTMENT OF MUSIC AND ART

Professor LaBar, Chairperson; Professors Brock (Glass), Campbell (Wood), Coleman (Art Education), Coogan (Metals), Danner (Theory/Composition), Decker (Trumpet), Doubet (Art Foundations), Hermann (Band/Music Education), Kennedy (Voice/Opera), Lotz (Bassoon/Music History), Martin (Flute), McCormick (Jazz Studies), Morris (Tuba/Euphonium), Pitelka (Clay), Thurmond (Clarinet), Ventura (Art History), Woodworth (Oboe/Theory); Associate Professors Allcott (Orchestras/Violoncello), Barham ( Saxophone), Brady (Flutes), Chang (Violin), Godes (Piano), Hauser (Trombone/Theory), Pulte (Voice); Assistant Professors Clark (Music Therapy), Hansen (Horn), Harris (Band/Music Education), Sullivan (Vocal/General Music Education), Willie (Percussion), Zamer (Choral)

The Department of Music and Art provides an intellectual and creative environment for the study and production of the visual and performing arts. The faculty emphasizes quality instruction, in both the classroom and the studio, embraces innovation, and acknowledges the role of technology in meeting the academic and artistic needs of the students. The Department prepares students for careers in music and the visual arts, enables students to enrich their lives by participating in music and art activities, instills in all University students an appreciation of music and the visual arts, and broadens the cultural perspective of the community, state, and region.

The primary function of the Joe L. Evins Appalachian Center for Craft is to serve the Bachelor of Fine Arts program and to offer a high quality studio art curriculum, concentrating in the craft media of clay, fibers, glass, metals, and wood. The Craft Center also enhances a flourishing crafts culture in the region and supports the preservation of traditional craft techniques through its workshop and exhibition program.

MUSIC EDUCATION

Students majoring in music education will follow either the Instrumental or Vocal/General curriculum. Students must select a major performing medium for private study; Instrumental Majors select a band or orchestral concentration, and Vocal/General majors select voice, piano, or organ. Moreover, music education students must:
1. Enroll for private study in the major performing medium each semester of full-time residency.
2. Participate each semester in the Ensemble of Record specific to the student’s instrument:
   a. Piano: Concert Choir, University Bands, or University Orchestra
   b. Strings: University Orchestra
   c. Voice: Concert Choir or Chorale
   d. Wind/Percussion:
      Fall – Marching Band
      Spring – University Bands
3. Participate each semester in either studio or departmental recital and, at the discretion of the studio instructor, perform as a soloist in public recital.
4. Attend twelve (12) recitals or concerts during each semester of full-time residency.
5. Satisfy the proficiency examinations in piano, harmony, aural techniques, and sight singing.

MUSIC PERFORMANCE

Admission to the performance option is by recommendation of the studio instructor. Students in this option select an emphasis in composition, instrumental, piano or vocal performance, or jazz.

Students majoring in any performance option must:
1. Enroll for private study in the major performing medium each semester of full-time residency. Four semesters of private study must be at the 3000 level.
2. Participate each semester in the Ensemble of Record specific to the student’s instrument:
   Lower Division (Freshman and Sophomore)
   a. Piano: Concert Choir, University Bands, or University Orchestra
   b. Strings: University Orchestra
   c. Voice: Concert Choir or Chorale
   d. Wind/Percussion:
      Fall – Marching Band
      Spring – Symphony Band or Concert Band as assigned by audition
   Upper Division (Junior and Senior)
   NOTE: A minimum of two (2) ensembles per semester is required of all Upper Division performance majors except for those in either the Composition or Vocal option. Composition students follow Lower Division Ensemble of Record requirement throughout their curriculum.
   a. Piano: The appropriate major ensemble (instrumental or vocal) plus Chamber Music as assigned by the piano coordinator.
   b. Strings: University Orchestra and Chamber
Tennessee Technological University

Music

- Voice: Chorale or Concert Choir

Wind/Percussion:
- Jazz: Jazz Ensemble plus Symphony band or Wind Ensemble
- Non-Jazz: Wind Ensemble (fall) and Symphony Band (spring) plus University Orchestra or Bryan Symphony Orchestra, or Jazz Ensemble as assigned by the advisor

3. Perform as a soloist in public recital during both the Junior and Senior years and, at the discretion of the studio instructor, participate each semester in either studio or departmental recital.
4. Attend twelve (12) recitals or concerts during each semester of full-time residency.
5. Satisfy the proficiency examinations in piano, harmony, aural techniques, and sight singing.

ART EDUCATION

The degree Bachelor of Fine Arts, concentration in art education, prepares individuals to become art teachers in Grades K-12. The program for licensure in Art Education is designed to provide students with a broad liberal arts component, a program of professional studies, and a major in the teaching field. The purpose of the program, in keeping with the overall purpose of teacher education at Tennessee Technological University, is to foster the intellectual and creative growth of the preservice teacher, to provide the knowledge and skills necessary to become competent in communication and instruction, to develop the knowledge and skills in the content area necessary to the teacher to adapt the content to the needs of students, and to provide the teacher the means to acquire and implement strategies for developing creativity in students, regardless of the socioeconomic or physical/mental limitations of these students. With an Art Education degree, you can:

- Teach art in the public schools.
- Work in the education department of an art museum.
- Work as a recreation counselor in homes for the elderly.
- Have a good foundation to continue graduate work in Art Therapy.
- Teach art in day care centers.
- Teach art in after-school programs.
- Continue on with graduate studies and teach art in a university setting.

CRAFT

Ward Doubet, Interim Director

The Joe L. Evins Appalachian Center for Craft offers over 50,000 square feet of studio space in clay, fibers, glass, metal and wood. Fully committed to their work both as teachers and as artists, they provide excellent studio instruction in an extraordinary studio environment. Six artists-in-residence also enhance the studio and gallery offerings. The campus art faculty and all the general educational resources of Tennessee Technological University round out this unique, top-quality educational experience administered by the TTU Department of Music and Art.

The Craft Certificate Program is designed for those seeking a professional-level training in craft media without the objective of a college degree. This provides an especially good opportunity for those who already have a degree and wish to focus on specialized training. Students finishing the Craft Certificate Program receive a Certificate of Completion from the Craft Center. This represents a significant level of accomplishment, but it is not a college degree.

Certificate Program admission standards are the same as for the BFA degree program. Course requirements are similar to the BFA curriculum, but exclude general education courses and the BFA thesis project and exhibition. Independent study credits may, at the discretion of the faculty advisor, be applied to a studio project representing the level of accomplishment at culmination of studies. Students in the Certificate Program must maintain at least six credits of coursework per semester, and must complete the foundation requirements within the first eighteen credits in the program.

Craft Certificate Requirements

Foundations -11 credits if the student takes ART 2070 or 12 credits if the student takes ART 2320 or ART 2330.

- ART 1010 - Two-Dimensional Design Credit 3.
- ART 2010 - Three-Dimensional Design Credit 3.
- ART 2310 - Drawing I, Introduction Credit 3.

Plus one of the following:

- ART 2320 - Drawing II Credit 3.
- ART 2330 - Technical Drawing Credit 3.
- ART 2070 - Digital Art Basics Credit 2.

Primary Emphasis – 24 credits

- See below for primary emphasis course requirements listed by medium.

Art History – 6 credits selected from:

- ART 2110 - Art History I Credit 3.
- ART 2120 - Art History II Credit 3.
- ART 3130 - Twentieth-Century Art Credit 3.
- ART 3150 - History of Crafts I Credit 3.
- ART 3160 - History of Crafts II Credit 3.

Electives (outside area of emphasis) – 6 credits

Can be two intro courses in separate media, an intro and an intermediate course in one medium, additional art history, or courses in non-art fields.
Craft Certificate – Primary Emphasis Course
Requirements by Medium

**Clay**

- ART 2510 - Introduction to Clay Credit 3.
- ART 3510 - Clay on the Wheel Credit 3.
- ART 3511 - Intermediate Handbuilding Credit 3.
- ART 3520 - Advanced Clay Studio Credit 3.
- ART 3521 - Advanced Clay Studio Credit 3.
- ART 3520 - Advanced Clay Studio Credit 3 or
- ART 3521 - Advanced Clay Studio Credit 3.
- ART 3530 - Independent Studies in Clay or
- ART 3531 - Independent Studies in Clay Credit 6 (or other advanced coursework in clay as determined by faculty advisor)

**Fibers**

- ART 2610 - Introduction to Fibers Credit 3.
- ART 3620 - Surface Design I Credit 3.
- ART 3621 - Surface Design II Credit 3.
- ART 3610 - Weaving I Credit 3.
- ART 3611 - Weaving II Credit 3.
- ART 4640 - Special Problems in Fibers Credit 3.
- ART 3630 - Independent Studies in Fibers or
- ART 3631 - Independent Studies in Fibers Credit 6 (or other advanced coursework in fibers as determined by faculty advisor)

**Glass**

- ART 2710 - Introduction to Glass Credit 3.
- ART 3710 - Intermediate Glass Studio Credit 3.
- ART 3720 - Advanced Glass Studio Credit 3.
- ART 3720 - Advanced Glass Studio Credit 3.
- ART 3720 - Advanced Glass Studio Credit 3.
- ART 3730 - Independent Studies in Glass or
- ART 3731 - Independent Studies in Glass Credit 6 credits (or other advanced coursework in glass as determined by faculty advisor)

**Metals**

- ART 2810 - Introduction to Metals Credit 3.
- ART 3810 - Metals Studio—Metalsmithing Credit 3.
- ART 3820 - Metals Studio—Blacksmithing Credit 3.
- ART 3811 - Metals Studio—Metalsmithing Credit 3 or
- ART 3821 - Metals Studio—Blacksmithing Credit 3.

**PAINTING**

The Bachelor of Fine Arts, Concentration in Painting, is designed to prepare the student to become a fine artist. The integration of studio and lecture courses in the curriculum as well as activities and enrichment opportunities encourages the skills and concepts essential to the student's growth as an artist. The curriculum and program experiences provide the student with a broad knowledge of the visual arts, the stylistic characteristics of historical periods, and multicultural artistic traditions. Studies in both lecture and studio courses provide the student with the knowledge of the elements and principles of art and the experience to apply those elements in the processes of analysis and personal artistic expression. Coursework prepares the student to formulate evaluative judgments about existing works of art and make realistic qualitative decisions concerning personal creative expressions. Throughout the program, the development of the student as a professional will be emphasized, and this will culminate in the presentation of a Senior Thesis exhibition and portfolio. Opportunities through both formal studies and informal events (student art exhibitions, participation in juried competitions, visits to professional artists' studios, visiting artist programs) prepare the student for a career in art.

Of primary importance in the BFA painting concentration is the development of skills, concepts, and sensitivities essential to the professional artist or designer. In pursuing this program, the student becomes familiar with the roles of creator, scholar, and teacher and attains the necessary technical competence, knowledge of art and art history, understanding of style and its implications, ability in critical thinking, insight into the role of art and design in the life of humankind, and the ability to identify and solve problems.
D. Huddleston, Interim Dean
R.C. Loutzenheiser, Associate Dean for Basic Engineering, Recruiting and Retention
S. Deivanayagam, Associate Dean for Graduate Studies and Research
T.D. Marable, Director of Minority Engineering

VISION

The College of Engineering will be an acknowledged leader in engineering and technology education.

MISSION

Through education, research and service, we will prepare our graduates to integrate their expertise as engineers and technologists with cultural understanding to improve life in the region and the world.

UNDERGRADUATE STUDIES

The College of Engineering offers seven programs with curricula leading to Bachelor of Science degrees in Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering, and Industrial Technology. Most students entering the College may select a particular major. However, if a student is not sure which major to enter, a common first-year curriculum for most majors is provided by the Basic Engineering Program, allowing additional time for the student to select a field of specialization.

The undergraduate programs in Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of ABET, INC. The Industrial Technology program is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE).

The normal load in the Engineering or Industrial Technology curricula is approximately 16 semester hours. Students may enroll for lighter loads, which will result in an increase in the number of terms necessary to complete requirements for graduation.

GRADUATE STUDIES

The College of Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees.

The Master of Science, a research-oriented degree program, is offered with majors in Chemical Engineering, Civil Engineering, Electrical Engineering, and Mechanical Engineering. Some programs include a non-thesis option. A full-time student usually completes the degree in 18 to 24 months.

The Doctor of Philosophy, coordinated by the Associate Dean for Graduate Studies and Research, is under the direction of faculty advisory committees which are interdepartmental in nature. A highly qualified student, possessing an M.S. degree in Engineering, will normally need three to four years of full-time study to complete the degree.

THE COOPERATIVE EDUCATION PROGRAMS

Students of all curricula of the College of Engineering are eligible to participate in the University's Cooperative Education program. This program is one in which classroom study is integrated with practical industrial experience in an organized program under which students alternate on-campus study with off-campus employment in industry or with a governmental agency.

A student on the cooperative education program must complete the same course work as required of the regular four-year students. For a common program, a student initially attends college full-time for three semesters, has an off-campus COOP assignment for one to three semesters, returns to the campus for two or three semesters, and then returns to the campus to complete graduation requirements. The COOP program provides an excellent hands-on experience, but usually adds one or two additional years to complete the BS degree requirements. See Cooperative Education for more details.

MINORITY ENGINEERING PROGRAM

The College of Engineering is committed to development of minority engineers through scholarships and special cooperative education opportunities. Several scholarships are offered for minority applicants in conjunction with a COOP experience.

CENTERS OF EXCELLENCE

The College operates three State-supported accomplished Centers of Excellence: the Center for Manufacturing Research; the Center for the Management, Utilization and Protection of Water Resources; and the Center for Energy Systems Research. These Centers provide financial support and state-of-the-art facilities for undergraduate and graduate research projects.

ADMISSION OF FRESHMEN

In addition to meeting the requirements for admission to the University, students seeking admission to an Engineering major must have at least a 2.35 high school average and must have achieved a composite score of at least 20 and a mathematics subtest score of at least 20 on the ACT Test. It is advisable for engineering students to have completed 4 units of science (including physics, if possible) and at least 3 1/2 units of college preparatory mathematics, including a study of trigonometric identities, in high school. Applicants who have met the necessary prerequisites and have scored at least 27 on the mathematics ACT subtest will be admitted to Calculus I (MATH 1910). Precalculus courses (MATH 1710, MATH 1720, or MATH 1730) or other math courses intended as preparation for MATH 1910 may not be utilized to satisfy any curricular requirement for graduation in an Engineering major. Students with less than the recommended preparation in mathematics are encouraged to enter the College of Engineering during summer semester immediately following high school
graduation. Course offerings are normally available during the summer semester for students with deficiencies and for students who wish to begin their studies early.

Students selecting the Industrial Technology curriculum must have completed two units of high school algebra.

ADMISSION OF TRANSFER STUDENTS

In addition to meeting the requirements for admission to the University, transfer students seeking admission to an Engineering major must have:

- a cumulative higher education QPA of at least 2.0 (excluding credit for remedial and developmental courses) and
- a grade of "C" or higher in a pre-calculus mathematics course that includes a study of the trigonometric identities.

The College of Engineering will assist transfer students in making the transition to Tennessee Tech at any point in their academic programs.

These requirements also apply to current TTU students desiring to change their major from a non-engineering program to Engineering. Tennessee Tech's engineering curricula are designed so that the needs of students who choose to initially attend a community college or other college/university not offering a B.S. engineering program may be met. Students who complete the following list of approved courses at another institution may complete curricular requirements for a B.S. degree in Engineering at Tennessee Tech in approximately two years.

Students who wish to transfer to the Industrial Technology program should consult with the Chairperson of the Department of Manufacturing and Industrial Technology.

Suggested Courses for 2-year Pre-engineering Program

<table>
<thead>
<tr>
<th>Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Chemistry with Laboratory</td>
<td>8</td>
</tr>
<tr>
<td>English: Composition</td>
<td>6</td>
</tr>
<tr>
<td>Speech</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Graphics (must include CAD experience)</td>
<td>2</td>
</tr>
<tr>
<td>Introduction to Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Computer Programming</td>
<td>2</td>
</tr>
<tr>
<td>Calculus</td>
<td>12</td>
</tr>
<tr>
<td>Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>English: American, British or World Literature</td>
<td>3</td>
</tr>
<tr>
<td>Physics (Calculus-based) with Laboratory</td>
<td>8</td>
</tr>
<tr>
<td>Mechanics – Statics</td>
<td>3</td>
</tr>
<tr>
<td>Mechanics – Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>Social/Behavioral Sciences</td>
<td>6</td>
</tr>
</tbody>
</table>

1 Students intending to major in Computer or Electrical Engineering do not need to take Chemistry II.
2 Students intending to major in Chemical, Computer or Electrical Engineering do not need to take Graphics.
3 Students intending to major in Computer, Electrical or Mechanical Engineering do not need to take Introduction.
4 Students should see the specific discipline for requirements.
5 This varies from 3 to 8, see the specific discipline to determine requirements.
6 Students planning to major in Chemical, Computer or Electrical Engineering should see the specific discipline for requirements.
7 See subsequent section on B.S. Degree and General Education Requirements.

B.S. DEGREE AND GENERAL EDUCATION REQUIREMENTS

The student must complete the curriculum for the major subject chosen and must comply with General Requirements for a Baccalaureate Degree and the General Education Requirements. However, students majoring in engineering who completed one unit of American history in high school are exempt from the requirement of six semester hours of American history. Industrial Technology majors are not exempt and must take American History. If a student is deficient in high school history and/or other subjects, the student must remove the deficiency before earning 60 credit hours.

Studies in the General Education Requirements serve not only to meet the objectives of a broad education but also to meet the objectives of the professional accreditation agencies – ABET and ATMAE. In the interest of making engineering/technology students fully aware of their social responsibilities and their ability to consider related factors in decision-making, courses in the humanities/fine arts and the social/behavioral sciences are required. Each student is obligated to understand these requirements and know any special requirements within their particular major.

The courses offered in the "major subject" (used to calculate Major QPA) include all courses taken which bear the student's departmental designation. This excludes courses listed as not for credit for these students. For computer engineering, ECE and CSC courses will constitute the "major subject." Transfer courses that are equivalent to TTU courses will be considered in the QPA in the major but not in the QPA in the major at TTU. The departmental chairperson, or faculty member designated by the chairperson, serves as the student's academic advisor.
The College of Engineering includes the following departments which offer curricula as follows:

<table>
<thead>
<tr>
<th>Department</th>
<th>Curriculum</th>
<th>Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering</td>
<td>Chemical Engineering</td>
<td>B.S., M.S.Ch.E.</td>
</tr>
<tr>
<td>Civil &amp; Environmental Engineering</td>
<td>Civil Engineering</td>
<td>B.S., M.S.C.E.</td>
</tr>
<tr>
<td>Electrical &amp; Computer Engineering</td>
<td>Electrical Engineering</td>
<td>B.S., M.S.E.E.</td>
</tr>
<tr>
<td></td>
<td>Computer Engineering</td>
<td>B.S. Cmp.E.</td>
</tr>
<tr>
<td>Industrial &amp; Systems Engineering</td>
<td>Industrial Engineering</td>
<td>B.S. I.E.</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Mechanical Engineering</td>
<td>B.S., M.S.M.E.</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>Chemical, Civil, Electrical, and Mechanical Engineering</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Manufacturing &amp; Industrial Technology</td>
<td>Industrial Technology</td>
<td>B.S. I.T.</td>
</tr>
</tbody>
</table>

Individual curricula begin on Catalog page 100. Course descriptions begin on Catalog page 171.

**Basic Engineering Program**

**Professor Loutzenheiser, Associate Dean for Basic Engineering, Recruiting & Retention; Associate Professors Hunter, Rose; Assistant Professors Craven, Wells**

The primary mission of the Basic Engineering Program is to provide an initial major for entering students who have not decided on a specific engineering discipline. This is a common situation for many entering students, who often have not had sufficient exposure to the various engineering disciplines to make a selection. Students who are eligible for admission to the College of Engineering may choose to major in Basic Engineering during their first year. Basic Engineering faculty will advise these students and assist them in the selection of a degree-granting major.

The Basic Engineering Program also provides academic and administrative support to the degree-granting programs in the College of Engineering. Academic support includes courses in engineering graphics, computer programming, an introduction to the engineering profession, and connections. The introduction course includes both hands-on laboratory activities and a team-based design project. All courses are designed to prepare TTU engineering majors with the foundation knowledge and skills required to succeed in an engineering baccalaureate degree program. The administrative support functions vary by degree-granting program and include recruiting activities, mathematics placement testing, registration activities, transfer credit evaluation, student advisement, and student records management.

The Basic Engineering curriculum covers the freshman year and includes:

- fundamental subjects, such as calculus, chemistry, and English writing;
- engineering skills, such as engineering graphics and computer programming;
- an overview of the engineering profession, including laboratory activities and a team-based design project;
- two elective courses in the area of humanities and fine arts; and
- engagement in meaningful academic and non-academic, out-of-the-classroom activities.

The freshman year curricula for Civil, Industrial, and Mechanical Engineering are nearly identical to the Basic Engineering curriculum. The freshman year curriculum for Chemical Engineering does not require the engineering graphics course but includes CHE 1510. The freshman year curricula for Computer and Electrical Engineering do not require engineering graphics, engineering computer programming, or introduction to engineering courses and replace the second semester of chemistry with the first semester of calculus-based physics and lab. Basic Engineering students may change majors to any degree-granting department in the College of Engineering at any time. Basic Engineering students may not register for upper division engineering courses (3000 and 4000 level). The chairperson of the department in which the upper-division course is taught, with the approval of the Associate Dean for Basic Engineering, Recruiting and Retention, may grant an exception for unusual circumstances.

Students entering the Basic Engineering Program are considered to have simultaneously entered the curriculum of any degree-granting program in the College of Engineering and may graduate by satisfying the requirements of the catalog then in effect.

**Department of Chemical Engineering**

**Professor Arce, Chairperson; Professors Biernacki; Assistant Professors Carpen, Stretz, Rice-York (Center for Manufacturing Research)**

Chemical Engineering (ChE) is a respected and ideal profession for modern times and dynamic changing markets. It is broad, adaptable to a large family of businesses (i.e., petroleum, environmental, biotechnology, biomedicine, pharmaceutical, materials, food and others) and highly paid. Rooted in basic sciences, ChE is mainly concerned with the design, scaling (up or down), operation and control of the transformation and separation of raw materials into valuable products. Chemical Engineers are the inventors of nylon fibers,
The Department of Chemical Engineering at Tennessee Tech is a vibrant community of engineering educators where both teaching and research synergistically work to effectively enhance student learning. In fact, Tennessee Tech is the home of some of the top educators in the region with most of the ChE Department engaged in active research on various aspects of student learning. These efforts have led to multi-award winning distinctions university-wide, nationally and internationally. ChE faculty members are frequently invited to conduct training workshops for colleagues in the United States and abroad and, therefore, students are exposed to some of the most effective and modern approaches in engineering education. The ChE curriculum is often revised to reflect changes in teaching pedagogy as well as shifts in the areas that hire our graduates, such as biotechnology, materials, and the environment. Thus, Chemical Engineering at Tennessee Tech offers a well-rounded, competitive and modern curriculum highly adaptable to the changing markets of the present time.

For those interested in industrial careers, the Tennessee Tech experience has proven successful in a variety of businesses and national labs, such as Eastman, DuPont, Proctor & Gamble, Pharmacia, International Paper and Saturn, among others, as well as the Environmental Protection Agency and the Department of Energy (Oak Ridge). For those more interested in graduate education, Tennessee Tech graduates can be found at some of the most prestigious universities in the country and have received fellowships from competitive agencies such as the National Science Foundation and Tau Beta Pi.

The Department of Chemical Engineering offers programs leading to the degrees of Bachelor of Science, Master of Science in Chemical Engineering, and Doctor of Philosophy in Engineering. The undergraduate chemical engineering program is accredited by ABET’s Engineering Accreditation Commission and the American Institute of Chemical Engineers. Two options are offered, both standard as well as biomolecular concentration. Additionally, for those more motivated and qualified students, a distinction in the major option is available to enhance the B.S. degree as well as a fast-track (5-year) B.S./M.S. option.

The mission of the Chemical Engineering Department at Tennessee Tech is to prepare relevant and adaptive chemical engineers in state-of-the-art areas by emphasizing real world problem solving and critical thinking skills.

Students majoring in Chemical Engineering must meet the College of Engineering requirements for a Bachelor of Science degree as well as the Accreditation Board for Engineering and Technology requirements. Students majoring in chemical engineering take courses in composition, literature, humanities, social science, mathematics, physics and chemistry. Students are required to take more than 40 hours of chemical engineering core courses including Material and Energy Balances, Thermodynamics, Transport Processes, Process Control, Reaction Kinetics and Process Design. In order to relate theory developed in classroom environments to practical application, most chemical engineering classes have an integrated lab experience. Nine hours of technical electives are also required that allow the student curricular flexibility.

Owing to the increased level of regional and national interest in bio-related fields within chemical engineering (biofuels, pharmaceuticals, etc.), the Department of Chemical Engineering now offers a “Bio-Molecular Engineering Concentration”. Students graduating with Bio-Molecular Engineering Concentration will still receive a B.S. Chemical Engineering degree (and take all of the core chemical engineering classes), but will have extensive exposure to bio-related courses (cell biology, biochemistry, microbiology, biological processes in chemical engineering, etc.). Note that students enrolling in the Bio-Molecular Engineering Concentration will not encounter any additional credit hour burden.

In addition to a vibrant, graduate-level research program, the Department of Chemical Engineering offers many opportunities for undergraduate research for freshmen through senior students. Such recent topics include micro devices, materials fabrication, nanoparticles, fuel cells, and molecular-level compound design, among others. Students have the opportunity to present their work at regional and national conferences as well as become co-authors in refereed journal publications. Performing undergraduate research is one of the most successful roads to graduate school for an M.S. or a Ph.D. degree. A number of our recent B.S. graduates have continued their graduate studies at Tech, while others have entered graduate programs at universities like Georgia Tech and MIT.
achieve at various stages of their professional career, are as follows:

1. Graduates should demonstrate the ability for early career professional growth based on their grasp of fundamental concepts in civil engineering. Within the first few years after graduation, CEE graduates should be employed by an organization that serves the profession or enrolled in postgraduate studies. They should be participating in engineering practice based on their academic foundation.

2. Graduates should utilize knowledge and skills to participate in civil engineering design and/or management processes. About five years beyond graduation, CEE graduates should be participating effectively in design processes and developing civil engineering solutions within a team setting. They are expected to be engaged in management and leadership roles for civil engineering projects and to assume positions of greater responsibility to the profession and public.

3. Graduates should develop professionally through a commitment to life-long learning. At all stages, CEE graduates should exhibit their potential for a sustained productive career through life-long learning. They should continue the professional registration process if necessitated by employment.

Achievement of the department's goal and objectives are assessed through various measures. Current assessment measures include course portfolio, graduating senior exit survey, college base exam, Co-Op participant survey, performance on the subject areas of the Fundamentals of Engineering Examination (FE) Engineering. Civil Engineering students are required to take CEE courses increases from 8 percent in the sophomore year to 39 percent in the junior year and 52 percent in the senior year. Several courses including those that may be taken as a sequence and/or technical elective are considered to be totally design. In addition to technical design concepts, the student applies other realistic constraints in design; namely, economic factors, safety, reliability, aesthetics, ethics and social impacts. The design component in most senior courses addresses design with applications to practical engineering problems so that the student is exposed to design experiences pertaining to his/her specific emphasis.

Senior Design Project, CEE 4950, provides a major overall design experience and is scheduled to be taken during the last semester. The course emphasizes the use of principles acquired during the previous seven semesters, and formal lectures are kept to a minimum. Students are organized into teams composed of members representing each area of emphasis in Civil Engineering to produce designs for the same project. Each team must make its own decision as to its “best” design.

The undergraduate Civil Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Students are expected to select an area of concentration from among the following: Transportation Engineering, Structural Engineering, Structural Mechanics, or Environmental Engineering. Civil Engineering students are required to take the Fundamentals of Engineering Examination (FE) administered by the Tennessee State Board of Architectural and Engineering Examiners.

Department of Computer Science

Associate Professor Talbert, Chairperson; Professor Scott (Stonecipher/Boeing Distinguished Professor of Computing); Associate Professors Hume, Kosa, Rogers; Assistant Professors Eberle, Ghafoor, Siraj; Instructor Boshart

The computer science curriculum is designed to educate students in the basic areas of computer science, including computer architecture, programming languages and operating systems, general approaches to problem solving and programming, as well as theoretical concepts dealing with models of computation and the design and analysis of algorithms. By appropriate choice of elective course work, the student may prepare for a career in software development for scientific/engineering applications, management decision support applications or graduate work in computer science. Graduates of the program are regularly recruited by industry, government and business for computing careers in a variety of areas including systems design and software engineering.

Department of Electrical and Computer Engineering

Professor Rajan, Interim Chairperson; Professors Alouani, Carnai, Mahajan, Ojo, Qiu (Center for Manufacturing Research); Radman, Ventrice; Associate Professors Austen, ElKeelany, Haggard; Assistant Professor Gao (Energy Systems Research Center)

The major goal of the Department of Electrical and Computer Engineering at Tennessee Technological University is to prepare its students for the challenges of the rapidly
Tennessee Technological University

changing fields of electrical and computer engineering. The department strives to achieve a quality reputation for its academic programs at the regional, national, and international levels. The mission of the department is to provide quality undergraduate and graduate education in the areas of electrical and computer engineering so as to enhance the competitiveness of our graduates in the job market and contribute to the economic, scientific and social development of the Middle Tennessee area, the State of Tennessee and the Nation. The department will maintain a positive academic environment that promotes excellence in learning and research through constructive interaction between students, faculty, staff, industry and community. The department will impart state of the art technical knowledge and research capabilities, enhance critical thinking, problem solving skills, and ethical responsibility and develop students’ verbal and written communication skills. In fulfilling the above mission, the department offers two undergraduate academic programs, one leading to the Bachelor of Science in Electrical Engineering (BSEE) degree and the other leading to Bachelor of Science in Computer Engineering (BSCmpE) degree. In addition, it also offers graduate programs leading to the Master of Science in Electrical Engineering (MSEE) and Doctor of Philosophy (Ph.D.) in Engineering degrees. The graduate programs are described in the Graduate Catalog.

Bachelor of Science in Electrical Engineering (BSEE) Degree Program

The department prepares well-rounded, professionally competent electrical engineering graduates who have a strong foundation in the fundamentals of electrical engineering. These graduates are employed by a number of small and big companies such as TVA, IBM, Raytheon, Texas Instruments, Motorola, Bell South, Saturn, Nissan, and many electric utilities. Founded in 1942, the BSEE degree program has produced more than 2,100 graduates. Since 1966, the program has been accredited by the Engineering Accreditation Commission of ABET or its predecessor organizations. The following educational objectives of the BSEE program have been formulated to meet the present and anticipated needs of the students and satisfy the University, State and accrediting agency requirements.

I. Within one year following graduation, our graduates will be employed in the electrical and computer engineering field and/or pursuing graduate studies.

II. Within five years following graduation, our graduates will have:

A. progressed in the careers as measured by indicators such as awards, recognitions, promotions, salary increases, positions of leadership, or entrepreneurial activities;

B. advanced their knowledge and expertise as measured by indicators such as continuing education, advanced degrees, or professional registration;

C. contributed to the profession and society as measured by indicators such as patents, publications, products or processes developed, professional service, or community services.

Students are required to follow an integrated curriculum of courses and experiences that result in a set of outcomes that ensure the achievement of the above objectives.

Bachelor of Science in Computer Engineering (BSCmpE) Degree Program

The BSCmpE program is designed to meet the growing demand for engineers who have expertise in the design of both hardware as well as software of computers and computer-based systems. The program was started in 1998 and has been accredited by the Engineering Accreditation Commission of ABET effective from the beginning. This program, a joint effort between the Department of Electrical and Computer Engineering and the Department of Computer Science, is designed to prepare graduates for entry into the computer engineering profession. The educational objectives are formulated so as to meet the present and anticipated needs of students and satisfy the State, University and accreditation agency requirements. Specifically the educational objectives of the BSCmpE degree program are as follows:

I. Within one year following graduation, our graduates will be employed in the electrical and computer engineering field and/or pursuing graduate studies.

II. Within five years following graduation, our graduates will have:

A. progressed in their careers as measured by indicators such as awards, recognitions, promotions, salary increases, positions of leadership, or entrepreneurial activities;

B. advanced their knowledge and expertise as measured by indicators such as continuing education, advanced degrees, or professional registration;

C. contributed to the profession and society as measured by indicators such as patents,
The Department of Industrial and Systems Engineering lays considerable emphasis on laboratory experience and computer applications and the department maintains appropriate state-of-the-art laboratory and computer facilities. An integrated design experience is provided to students starting with elementary designs in freshman and sophomore level courses and ending with a capstone design experience in a senior level multidisciplinary design course. The program lays considerable emphasis on laboratory experience and computer applications and the department maintains appropriate state-of-the-art laboratory and computer facilities.

The students are encouraged to develop leadership and other social skills by participating in a number of professional and honor societies such as IEEE and Eta Kappa Nu.

The ISE Department offers the Bachelor of Science in Industrial Engineering (BSIE) degree program which is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). The educational mission of the Industrial and Systems Engineering (ISE) Department is to develop benchmark quality industrial engineers with broad-based expertise in the design, development, and management of integrated production and service systems.

IE consistently ranks in the top 25% of 250 occupations for job satisfaction – the highest of all major branches of engineering. According to the Bureau of Labor Statistics, IE is the fourth largest engineering discipline in the United States in terms of jobs. IE also has among the highest percentage of women practitioners of all engineering disciplines. Because of the educational background, many IE graduates have opportunities to move quickly into management.

Industrial engineers are productivity, cost, and quality improvement specialists who examine all aspects of the organization to determine the most efficient and effective way to use resources. About sixty percent of industrial engineering (IE) jobs are in manufacturing. However, because flexibility characterizes IE, industrial engineers have a greater variety of opportunities than other engineering disciplines. For example, IE skills are used to improve productivity and quality in health care, insurance, banking, utilities, hospitality, transportation and distribution/logistics, construction, retail, consulting, and government.

The following Program Outcomes characterize graduates on the day the BSIE Degree is awarded.

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
(l) an ability to specify data requirements to assess and improve system performance
(m) an ability to develop and evaluate abstract models of system performance
(n) an ability to utilize analytical techniques for decision-making
(o) an ability to provide leadership in individual and team situations

To achieve the above Program Outcomes the BSIE program builds upon a foundation of courses common to the traditional engineering freshman year that includes two humanities/fine arts electives, courses in calculus, chemistry, engineering graphics, computer programming, and an introduction to engineering course.

In the sophomore year are Calculus III and the Matrix Algebra course. The science courses are calculus-based physics and either a second physics course or an anatomy and...
Tennessee Technological University

The BSIE curriculum prepares students for the degree in Mechanical Engineering (B.S.M.E.). This degree prepares all graduates for entry-level professional employment and masters-level graduate studies. The department also offers an Industrial Engineering minor in several emphasis areas. The Quality Engineering emphasis provides the student with the statistical tools necessary for improvement of products, services, and processes. Most of the Six Sigma tools are covered. The Manufacturing Engineering emphasis includes lean and computer integrated manufacturing. The Engineering Decision Science option provides engineering and mathematics-based science majors an opportunity to apply mathematical modeling techniques to applications areas as diverse as modeling chemical processes, computer systems, and other non-traditional production systems. The Engineering Management option focuses on engineering management principles necessary to manage technical projects.

department of Mechanical Engineering

Professor Hoy, Chairperson; Professors Canfield, Darvennes, Han, Idem, Johnson, Munukuta, Peddie, Ting, D. Wilson, Zhu; Associate Professors Cui, Cunningham, Marquis, Pardue (STEM Center Director), C. Wilson, Zhang; Assistant Professor Yoon

The Department of Mechanical Engineering at Tennessee Technological University is committed to preparing its graduates for productive, professional careers in mechanical engineering. The Department offers the Bachelor of Science degree in Mechanical Engineering (B.S.M.E.). This degree program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

The profession of mechanical engineering focuses on motion and the forces and energy associated with motion. It encompasses the design and analysis of machines and processes to meet the expanding needs of a changing, technological, energy-based society. Applications within the profession are diverse; consequently, mechanical engineers may find positions in many specialties. ME graduates from Tennessee Tech may find employment in transportation industries, consulting firms, governmental agencies and laboratories, manufacturing facilities, power-production industries, process industries, universities and others. The undergraduate curriculum is broad in scope and strongly based in the fundamentals essential for professional practice, life-long learning, and advanced study at the graduate level. Design is a unique element of the profession; therefore, the design experience is developed and integrated throughout the curriculum.

The mission of the Department, within a regional and global context, encompasses: provision for its students to prepare for a productive life and livelihood in a competitive, dynamic, technologically-based society; advancement of the knowledge of mechanical engineering principles and applications; and service to the public. The Departmental mission is essential to the University-wide goal of maintaining a strong engineering program. The Department pursues the following four goals to fulfill its mission:

1. To maintain a high-quality, ABET-accredited program with an integrated curriculum. This goal is essential to prepare all graduates for entry-level professional employment and masters-level graduate studies.
2. To improve the student's ability to formulate and to express thoughts using both written and oral communication. This goal is essential to evaluate arguments and evidence from various fields of study, to discover information, and to engage in independent inquiry. In addition, this goal promotes an awareness of ethical, social and safety considerations in all engineering endeavors.
3. To enhance the student's capacity for leadership, individual responsibility and integrity. This goal should foster an appreciation and respect for new and different ideas, opinions, and abilities.
4. To develop the student's commitment to life-long learning. This goal should foster a desire to continually improve individual abilities and enhance knowledge. In addition, this goal promotes professional enthusiasm and an enhanced quality of life.
The freshman curriculum is similar for all engineering students. Here emphasis is placed on the fundamental tools of mathematics, chemistry, computer programming, written communication, humanities and basic engineering. Students are introduced to the University and engineering in Connections to Engineering (ENGR 1020). In Engineering Graphics (ENGR 1110), the importance of conveying ideas via sketches and computer-aided drafting; particular points are made relevant to machine design and manufacturability. Finally, in Programming for Engineers (ENGR 1120), students learn the essentials of programming methodology in a modern programming language.

The sophomore curriculum stresses the fundamental tools of mathematics, physics, and engineering sciences (statics, dynamics, mechanics of materials, and fundamentals of electrical engineering).

The junior curriculum is primarily devoted to the engineering fundamentals of thermodynamics, fluid mechanics, heat transfer, dynamics of machinery, mechanical systems, materials and processes in manufacturing and vibrations. Completing this is an upper division mathematics course and machine design course.

The senior curriculum contains capstone design experiences in three courses: Applied Machine Design (ME 4020 (5020)), Senior Design Project (ME 4444), and Thermal Design (ME 4720). The senior year of the ME curriculum is completed by each student's selection, in consultation with their advisor, of 4 senior technical electives referred to as Area of Emphasis (AOE) courses. These courses help prepare the student for whatever their future plans may be in engineering.

Department of Manufacturing and Industrial Technology
Professor ElSawy, Chairperson; Professors Fidan, Vondra; Associate Professor Kamal; Assistant Professor Graham

The Department of Manufacturing and Industrial Technology prepares competent technologists and applied engineering workforce dedicated to solving complex technological problems. The department is accredited by the Association of Technology, Management, and Applied Engineering (ATMAE) which sets standards for academic program accreditation, personal certification, and professional development for educators and industry professionals involved in integrating technology, leadership and design.

TTU's Department of Manufacturing and Industrial Technology (MIT) offers a four-year degree program leading to a BS Degree in Industrial Technology with a minor in Business. The department began in 1956 within the College of Engineering and has the distinction of being accredited by The Association of Technology, Management, and Applied Engineering (ATMAE) – previously the national Association of Industrial Technology (NAIT) - since 1982 and today serves as a model for Tennessee and the nation.

The Department of Manufacturing and Industrial Technology prepares technologists for employment in manufacturing industry and management/supervisory positions. Through specialized classes, group projects, hands-on-experience, active learning and individual assignments, students learn to be creative and resourceful. Students learn public relations, personnel supervision, and problem solving through group work, instruction, and guest speakers. This background enables graduates to share the planning responsibilities of the engineer, scientist, or manager, as well as the production responsibilities of the technician, craftsman, or laborer. The Department of Manufacturing and Industrial Technology graduates are trained in group leadership and communications at all levels of the industrial workforce.

The curriculum in Industrial Technology is built upon technical education and operations, human and industrial relations, business administration, and advanced technologies. The department strives to keep the curriculum up-to-date, incorporating new technological developments as they occur. The department offers classes in materials for manufacturing as well as conventional manufacturing processes such as: metal casting, metal manufacturing technology, welding technology, foundry technology, industrial plastics, and maintenance technology. Moreover, the department offers courses in high-tech areas such as Applied Electricity and electronics, Industrial Electronics, Programmable Logic Controllers and Process Control, Computer Numerical Control Machining Practices, Computer Aided Design and Industrial Automation, which includes Robotics and Hydraulics and Pneumatics. Plant Layout and Material Handling, Industrial Communications, and Industrial Supervision enable the manufacturing and industrial technology graduates to achieve the competencies required to apply the latest technological advances in a given field.

The curriculum also emphasizes other vital areas in the industrial workplace: Operations Management, Organizational Behavior, Accounting, Human Relations, Introduction to Psychology, Industrial Safety, Manufacturing Cost Estimating, Methods Design, and Quality Assurance six Sigma. The addition of these courses to the curriculum gives the graduates an appealing and well-rounded education. This lets potential employers know that she or he understands all of the common operations that exist within a manufacturing environment.

Professional support of any college program is a tremendous advantage to both the students and the businesses. This support is given to the Department of Manufacturing and Industrial Technology by the Advisory Board (MITAB). Nissan America, TRW, Peterbuilt, Saturn, BMW, UPS, and Advances Manufacturing Technologies, Incorporated are a few of the companies represented on the board. The advisory board is a great way to look at companies and see what they have to offer. They also provide a great collective knowledge about the industrial and manufacturing fields from which all students are encouraged to draw.

Manufacturing and Industrial Technology students are also strongly encouraged to participate in cooperative education assignments with well-respected industrial manufacturer. Qualified students gain valuable on-the-job experience while earning money to offset educational expenses. By supplying graduates with a technical, operational, and managerial education, the Department of Manufacturing and Industrial Technology meets the needs of manufacturing industry. The wide breadth of technical positions in the industry assures the MIT graduate of an interesting and challenging career. Most of the current MIT students have already secured jobs by the time they graduate.

Before graduation, MIT students are required to take either Certified Technology Manager (CTM) or Certified Manufacturing Specialist (CMS) examination administered by the Association of Technology, Management, and Applied Engineering (ATMAE). Historically, the outstanding pass rate of TTU students on this national examination attest the quality of the MIT graduates.
The School of Interdisciplinary Studies was established in Spring 2001 to provide innovative, high quality, educational opportunities in response to changing needs of the diverse population within TTU's service area and beyond. The school offers two undergraduate degrees, the Bachelor of Science in Interdisciplinary Studies and the Bachelor of Science in Professional Studies, which has concentrations in Information Technology and Organizational Leadership. The school also offers a graduate degree, the Master of Science in Professional Studies in Strategic Leadership. These Tennessee Tech University degrees are part of the Regents Online Degree Program (RODP) which is a collaborative effort of the 19 Tennessee Board of Regents institutions.

Undergraduate Degrees

Interdisciplinary Studies
The Bachelor of Science in Interdisciplinary Studies is a degree that allows students to custom design a course of study that matches their professional and personal interests. The major must be developed around a theme, a significant problem or topic. The program’s purpose is to allow students the opportunity to create a degree program that matches their particular interests and goals.

Professional Studies – Information Technology
The Bachelor of Science in Professional Studies with a concentration in Information Technology is designed to prepare managers and non-managers to use information for decision-making. Students will acquire the skills and knowledge necessary to engage in critical thinking and leadership development in information technology.

Professional Studies – Organizational Leadership
The Bachelor of Science in Professional Studies with a concentration in Organizational Leadership is designed to promote the understanding of the nature of organizations and the fundamentals of administrative leadership. Students will acquire the skills and knowledge necessary to engage in critical thinking and leadership development in organizational leadership.

Graduate Degree

Professional Studies – Strategic Leadership

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<tr>
<th>Department</th>
<th>Curriculum</th>
<th>Concentration</th>
<th>Degree</th>
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<tr>
<td>Interdisciplinary Studies</td>
<td>Interdisciplinary Studies</td>
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<td>B.S.</td>
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<tr>
<td>Professional Studies</td>
<td>Information Technology</td>
<td>Health Administration</td>
<td>B.S.</td>
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<td>International Organizational Leadership</td>
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<td></td>
<td>Organizational Leadership</td>
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Individual curricula begin on Catalog page 100. Course descriptions begin on Catalog page 171.
Susan A. Elkins, Vice President

Extended Programs and Regional Development (EP & RD) is a University-wide outreach and service unit which promotes educational, social, economic, and cultural development and welfare in Tennessee, particularly in the Upper Cumberland region and surrounding counties. One way this mission is carried out is through the delivery of credit and non-credit offerings both on-campus and at off-campus locations throughout the service area and beyond. These offerings are delivered both on-site and via various distance learning delivery methods. Deans, departmental chairpersons, and University faculty members participate in the off-campus advisory and instructional program to insure that courses offered are of the same quality as those taught on the main campus. Partnering with academic and administrative units, highly qualified personnel from business, industry, and various educational agencies are utilized to provide direction and instruction for conferences, seminars, workshops, and special events.

Courses and activities are offered at off-campus sites in TTU’s forty-two (42) county service area which is divided into three regions: Eastern, Southern, and Western. Each region has its own associate director whose job includes assisting students with their educational plans and helping Tennessee Tech understand students' course, program, and scheduling requirements. Information about course offerings and registration procedures may be obtained by contacting an associate director or EP & RD campus staff. Off-campus site coordinators are also employed to provide local assistance and information regarding the development of off-campus classes.

Credit Offerings

Extended Programs and Regional Development provides off-campus students access to educational opportunities at approved sites in locations recommended by the University and approved by the Tennessee Board of Regents and the Tennessee Higher Education Commission. Higher Education centers are operated collaboratively with Chattanooga State Technical Community College in Chattanooga, Motlow State Community College in McMinnville and Moore County, Roane State Community College in Crossville, Oak Ridge, and Scott County, and Volunteer State Community College in Livingston. Undergraduate coursework is also available at Pellissippi State Technical Community College in Knoxville and Roane State Community College in Harriman. Under the auspices of this agreement, students are provided the opportunity to work toward Associate, Baccalaureate, Master's and Specialist degrees. Courses are also conducted in classroom accommodations provided by Tennessee Technology centers and K-12 partners throughout the service area in response to a well-documented need.

Non-Credit Offerings

Non-Credit courses are offered to meet the needs of individuals, groups, and organizations both on-campus and off-campus. In most cases, participants need not satisfy specific educational requirements for admission to courses. Continuing Education Units (CEU's) are awarded and recorded for many non-credit courses, while others are offered strictly on a non-credit basis. Fees for non-credit courses vary and are based upon the cost of offering the course. Non-credit courses include life long learning classes for personal and professional enrichment, Youth University programs, and a host of online courses and certificate programs.

Workshops/Conferences/Special Events

Extended Programs and Regional Development collaborates with campus colleges/departments and community partners to offer credit and non-credit special events. Campus partners involved in typical events include: the College of Education; the College of Business; the College of Agricultural & Human Sciences; the College of Arts & Sciences; the Millard Oakley Science, Technology, Engineering, and Math (STEM) Center; and Information Technology Services. Community partners include: the State Department of Education; the Upper Cumberland Study Councils for School Directors, Principals, and Supervisors; and numerous other Upper Cumberland community service agencies involved with children’s services.

Emergency Medical Services Programs

University non-credit offerings include a full line of EMS courses from First Responder to Paramedic. The goal of these programs is to train top quality entry-level EMS personnel and to be the EMS educational resource for the Upper Cumberland and surrounding areas.

Grants and Special Projects

Extended Programs and Regional Development continually works to develop training and to provide support for educational entities, businesses, and industry in the University's service area. Through partnerships
with state agencies and departments, grants continue to be secured to aid in these efforts. As a result of a partnership with the Tennessee Department of Education, Division of Career and Technical Education, and the Department of Curriculum and Instruction in TTU’s College of Education, Extended Programs and Regional Development has been awarded a grant to develop new mentoring models for career technical teacher training and retention. The ultimate purpose of this initiative is to positively impact the economy in the Upper Cumberland region and the state of Tennessee by creating an educated and trained workforce.
Cooperative Education

Donald Foster, Associate Director

The Cooperative Education Program (Co-op) is a voluntary, independent educational program coordinated through the Office of Career Services, located on the third floor of the Roaden University Center. The program integrates formal classroom study with off-campus work experience. There are three co-op study/work plans: Plan A (alternating one-year cycles), Plan B (alternating semesters), or Plan C (simultaneous work and study assignment).

Co-op work assignments are available in industry and business, agricultural areas, educational systems, and governmental agencies. Students applying for Co-op are not guaranteed work assignments nor stipulated specific job benefits or salaries. Employers determine the salaries and pay students directly. In regard to permanent employment after graduation, participation in the Co-op Program involves no obligation on the part of the university, student, or employer. Co-op experience is a benefit to students in securing full-time employment following graduation. Many students do return to their co-op employers after graduation.

Co-op students are required to complete the same academic program for graduation as non-co-op students. Students must register and pay a fee for a one hour Co-op course each semester of their work assignment. Co-op students are classified as full-time by the university.

Students on assignment must submit a work report by an established date and will receive a grade of Satisfactory or Unsatisfactory (S or U). Students must maintain a 2.5 QPA.

Additional information about the Cooperative Education Program may be obtained by contacting the Office of Career Services.

Honors Program

Dr. Rita Barnes, Director
Mr. Michael Clark, Interim Associate Director

The Honors Program provides challenging learning opportunities for academically gifted students, motivating them to achieve their full academic and career potential. Enrollment in Honors classes is limited. Emphasis is placed on individual initiative and development, leadership and teamwork, critical thinking and communication skills.

HONORS SECTIONS

Honors sections are available in a number of regularly offered courses required of freshmen and sophomores. These sections are available to Honors Program students on a permit-only basis. Honors sections provide more intensive discussion, presentations, and greater opportunities for individual performance.

Full members of the Honors Program are given priority in registering for all Honors courses. Under special circumstances an Honors student may take a regular section as an Honors contract course.

The following Honors courses are available subject to scheduling:

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>ENGR 1110, ENGR 1120</td>
<td>ENGR 1110, ENGR 1120</td>
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<tr>
<td>BIOL 1110</td>
<td>BIOL 1120</td>
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<td>CHEM 1111</td>
<td>CHEM 1120</td>
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<tr>
<td>ECON 2010</td>
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<td>ENGL 2130</td>
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<td>ENGL 2230</td>
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<td>HIST 2010</td>
<td>HIST 2020</td>
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<tr>
<td>HON 1010</td>
<td>HON 4013</td>
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<tr>
<td>Honors 2000-level</td>
<td>Honors 4023</td>
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<tr>
<td>(Leadership and Personal Development)</td>
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<tr>
<td>HON 4013</td>
<td>MATH 1921</td>
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<td>HON 4023</td>
<td>MUS 1030</td>
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<tr>
<td>MATH 1911</td>
<td>PHIL 1030</td>
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<td>MUS 1030</td>
<td>PHYS 2112</td>
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<td>POLS 1000</td>
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<td>PHYS 2112</td>
<td>SPCH 2410</td>
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<td>SOC 1010</td>
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<td>SPCH 2410</td>
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LEVELS OF PARTICIPATION

High school students with a composite ACT score of 26 or higher who have applied for admission to the University are invited to apply for full membership in the Honors Program. Transfer students with an ACT of 26 or higher and a college QPA of 3.5 may apply to transfer into the Honors Program. Out-of-state students with an ACT of 26 or higher or equivalent SAT score and a high school grade point average of 3.5 may be considered for the Honors Academic Scholarship, which waives out-of-state tuition fees in exchange for 60 hours of service. Students already enrolled at Tennessee Tech who have completed twelve semester hours of college course work with a cumulative quality point average of 3.5 or better may apply for full membership in the Honors Program. Students at all levels of membership must complete at least one Honors course per semester until completing the course requirements listed below (“Graduation Requirements”) to maintain active membership eligibility.

Full Membership. All students must take HON 1010 during their first fall semester in Honors. To be accepted for full membership, a student must demonstrate the ability and willingness to meet the requirements for graduation in cursu honorum. At the end of the first semester in the Honors Program, a student must have at least a cumulative 3.1 average to maintain full membership. After the first semester, full members must maintain a cumulative 3.5 grade point average and take at least one honors course each semester. Full membership may be reinstated for students who have continued taking Honors courses when they regain a 3.5 cumulative QPA.

Associate Membership. A member whose QPA falls between 3.1 and 3.5 after the first semester continues
Tennessee Technological University

participation as an associate member, taking Honors courses and participating in the Associated Scholars Guild.

Affiliate Membership. Any student who is not a full or associate member but is continuing to fulfill Honors course requirements is an affiliate member. In general, an incoming freshman must have a composite ACT core of at least 26, and a previously enrolled student must have a cumulative QPA of at least 3.0 in order to enroll in an Honors course. However, exceptions may be made in individual cases, upon recommendation of the course instructor. Affiliate members may continue to be active in the Associated Scholars Guild. Honors 2000-level personal development courses do not count toward this requirement.

GRADUATION REQUIREMENTS

A full member of the Honors Program may graduate in cursu honorum by completing the following requirements in addition to all relevant university, college, and departmental requirements:

1. Completion of Honors 1010.
2. Completion of at least 15 semester hours in Honors courses in at least three different disciplines (Honors sections or Honors Contracts by permit).
3. Completion of two Honors colloquia (HON 4013) or one colloquium and one directed studies (HON 4023) or Honors Thesis.
4. A minimum cumulative quality point average of 3.5.
5. Completion of the Honors exit interview procedure.

A student graduating in cursu honorum will wear a gold stole and be given special recognition at the commencement ceremony and will have the notation "in cursu honorum" on the diploma and transcript.

Pre-Law

Students desiring to go on to law school may complete the requirements for a degree in virtually any curriculum offered at the University. A college degree and a satisfactory score on the Law School Admission Test are generally required for admission to an approved law school. The following advisors can provide information regarding law school admission requirements and standards, and they can assist the student in planning a program for a career in law.

Advisor
Ms. Edith Duvier        Arts and Sciences
Dr. Henry Mannie        Sociology and Political Science
Dr. Lori Maxwell        Sociology and Political Science
Dr. George Webb         History

Department of Military Science

U.S. Army Reserve Officers' Training Corps

LTC Brett Martin, Chairperson
Professor of Military Science

OBJECTIVE

The United States Army maintains at Tennessee Technological University a Senior Division of the Army Reserve Officers' Training Corps. The objective of the ROTC curriculum is to prepare selected students (scholars, athletes, leaders) with leadership potential to serve as commissioned officers in the Army Reserve, National Guard, and Active Army. The curriculum is designed to provide the student with an appreciation of the responsibilities of each American toward National Defense. Emphasis is placed on the world's premier leadership training course and the need for trained leaders in the United States Army.

INSTITUTIONAL REQUIREMENTS

Military Science is voluntary for all students. Students incur no military obligation by attending Basic Course Military Science classes during their freshman and/or sophomore years.

SENIOR ROTC PROGRAM

The General Military Science curriculum is in effect at this University. Classes in Military Science for the Basic and the Advanced Course are offered during both Fall and Spring Semesters.

The Senior Division ROTC Program includes four years of college work and is divided into (1) Basic Course and (2) Advanced Course.

1. The Basic Course (MS I and MS II) comprises the first two years of college ROTC, and each semester consists of classroom instruction and leadership laboratory.

2. The Advanced Course (MS III and MS IV) comprises the last two years of college ROTC, and each year consists of three hours per week including classroom instruction and leadership application. Additionally, Physical Training and Leadership Labs are conducted for a total of four hours per week. Attendance at Leader Development Assessment Course of five weeks is required between the junior and senior years. Some field training on weekends is required. The Advanced Course culminates in commissioning as a Second Lieutenant, United States Army, Army Reserves, or National Guard, upon graduation from the University.

REQUIREMENTS FOR COMMISSIONING

In order to receive a commission as a Second Lieutenant, the student must satisfy the following requirements:

1. Successfully complete the basic and advanced course requirements. Basic Course requirements can be satisfied by completing MS 1010, MS 1020, MS 2010, and MS 2020, or attending the Leader's Training Course (MS 2900), or substituting previous military experience (See Paragraph: Credits For Previous ROTC Training or Active Military Service). The classes listed below constitute the Advanced Course:
   MS 3010          Fall Semester
   MS 3020          Spring Semester
   MS 3040 (Leadership Development Assessment Course)     Summer
   MS 4010          Fall Semester
   MS 4020          Spring Semester
In addition to the classes listed above, students
enrolled in the Advanced Course must take MS 3000-01/MS 4000-01 (Physical Training) each semester.
2. Meet ROTC commissioning requirements, the Army's Height/Weight standards and pass the Army Physical Fitness Test.
3. In addition to the Basic and Advanced Courses, the student must complete a military history course or MS 3222 (Introduction to Officer Professional Development). The student should confer with the Professor of Military Science to determine which course will satisfy this requirement.
4. Meet graduation requirements.

SCHOLARSHIPS AND FINANCIAL AID

The ROTC Program offers 4-year, 3-year, and 2-year scholarships to qualified students. Additionally, contracted students in the Advanced Course are paid on a monthly basis. The Professor of Military Science offers a limited number of University dorm room scholarships for designated use. Advance course students and all scholarship students receive a monthly subsistence allowance during the school year. Students are also paid for the period of their attendance at the Leader's Training Course and the Leader Development Assessment Course. National Army ROTC scholarship applications can be made at www.armyrotc.com.

ENROLLMENT REQUIREMENTS

The general requirements for enrollment and continuance in ROTC are: (a) citizen of the United States, (b) physically and mentally qualified, (c) accepted by the university as a full-time student, (d) morally qualified, and (e) meet Army age requirements.

Enrollment in the Advanced Course is not open to all students completing the Basic Course but only to those whose ROTC and academic records are such to warrant the belief that they will become qualified officers in the Army of the United States.

Students who transfer from colleges or universities without ROTC programs may attend a paid five-week Leader's Training Course between their sophomore and junior years to meet the prerequisites of the Advanced Course (See MS 2900). Any students who desire to participate in this program should contact the Military Science Department prior to the end of their first semester.

Students must be selected by the Professor of Military Science and must execute a contract in writing agreeing to complete the Advanced Course and to accept a commission, if tendered, unless relieved from contract obligations by proper authority or by action of law.

DISENROLLMENT

Students may be disenrolled for failure to meet physical or academic standards, for disciplinary reasons, or for lack of officer-like aptitudes. A student once formally enrolled in the Advanced Courses may be discharged from the ROTC program in the event he is placed on academic probation by institutional authorities as the result of substandard academic grades.
tuition costs. In addition, cadets earn a monthly stipend of up to $400 and up to $600 per academic year to pay for textbooks.

We require cadets to attend AFROTC classes, in uniform, one day per week. One summer, typically between the sophomore and junior year, cadets must attend a four-week military training session. The combination of USAF military education, training, and college-level curriculum gives cadets a broad-based knowledge of management, leadership, and technical skills.

Although the USAF will accept students from any accredited academic major, there is a critical need for engineers (all disciplines). Upon graduation, cadets will earn USAF commissions, as Second Lieutenants, and must serve a minimum of four years on active duty.

For more information, visit www.AFROTC.com or telephone the Det 790 Unit Admissions Officer at 615-963-5931. Also visit the DET 790 website at www.tnstate.edu/rotc.
ACCOUNTING (ACCT)

(Leading to the Bachelor of Science in Business Administration Degree)

For courses in the freshman and sophomore years, see Basic Business (page 111).

Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 3170 Financial Accounting &amp; Reporting I</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 3180 Financial Accounting &amp; Reporting II</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 3210 Cost Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 3330 Federal Taxation I</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 3620 Auditing I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 3610 Business Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>BMGT 3510 Management &amp; Organization Behavior</td>
<td>3</td>
</tr>
<tr>
<td>DS 3520 Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 3840 Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>Communication Elective</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
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Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT electives</td>
<td>6</td>
</tr>
<tr>
<td>MKT 3400 Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>ECON 3320, 3810, or 3820</td>
<td>3</td>
</tr>
<tr>
<td>FIN 3210 Principles of Managerial Finance</td>
<td>3</td>
</tr>
<tr>
<td>LAW 3810 Business Legal Environment and Ethics</td>
<td>3</td>
</tr>
<tr>
<td>DS 3620 Management Science</td>
<td>3</td>
</tr>
<tr>
<td>BMGT 4930 Business Strategy</td>
<td>3</td>
</tr>
<tr>
<td>Business elective</td>
<td>3</td>
</tr>
<tr>
<td>Non-business elective</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

1. SPCH 2410 or PC 2500 if not taken as part of the General Education Core Communication requirement, ENGL 3250, 4970; MIT 4010; SPCH 3130, 3630, 4430, 4620, 4630; or a foreign language not taken as part of the humanities/fine arts requirement.

2. Accounting electives, select two courses:
   - ACCT 4230 Advanced Managerial Accounting
   - ACCT 4340 Tax Management for Entities
   - ACCT 4410 Financial Accounting and Reporting III
   - ACCT 4530 Governmental and Not-For-Profit Accounting
   - ACCT 4750 Auditing In An EDP Environment
   - ACCT 4800 Internship in Accounting

3. Elective courses are to be selected in consultation with the academic advisor. Accounting majors are required to complete a total of 11 non-business elective hours and six communication elective hours for graduation. Departmentally-approved communication courses and non-business electives are to be selected in consultation with the academic advisor and will be completed during the freshman, sophomore, junior, and senior years.

AGRICULTURE (AGRI)

AGRIBUSINESS MANAGEMENT CONCENTRATION (AGBE)

(Leading to the Bachelor of Science in Agriculture Degree)

Agribusiness Management provides training in economics and business management principles related to production, distribution, and consumption of agricultural goods and services. Graduates enter careers in government agencies, commodity trading, communications, public relations, finance, marketing, sales, and agribusiness management.

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 1200 Introductory Animal Science</td>
<td>3</td>
</tr>
<tr>
<td>AGRN 1100 Plant Science</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1130 College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1530, 1630, 1830 or 1910</td>
<td>3-4</td>
</tr>
<tr>
<td>CHEM 1010 Introduction to Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1020 Introduction to Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CSC 1100 or DS 2810</td>
<td>3</td>
</tr>
<tr>
<td>AGR 1020 Connections to Agriculture</td>
<td>1</td>
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<tr>
<td>Total</td>
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Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>AGBE 2100 Economics of Agriculture</td>
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</tr>
<tr>
<td>AGET 2110 or 3110</td>
<td>3</td>
</tr>
<tr>
<td>SPCH 2410 or PC 2500</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2010 Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2020 Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>AGBE 3110 Principles of Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>AGBE 2120 Principles of Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
<td>3</td>
</tr>
<tr>
<td>Humanities/Fine Arts Elective</td>
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</tr>
<tr>
<td>BIOL 1110 or 1120</td>
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<td>Total</td>
<td>31</td>
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Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGBE 3110 Agricultural Marketing &amp; Futures</td>
<td>3</td>
</tr>
<tr>
<td>AGBE 3400 Agricultural Finance</td>
<td>3</td>
</tr>
<tr>
<td>AGBE 4030 Agribusiness Management</td>
<td>3</td>
</tr>
<tr>
<td>AGRN 2210 Soils</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
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<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>Upper Division Business or Economics Elective</td>
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<tr>
<td>Upper Division Agriculture Electives</td>
<td>6</td>
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<tr>
<td>Humanities/Fine Arts Elective</td>
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<tr>
<td>Total</td>
<td>30</td>
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</table>
AGRICULTURAL COMMUNICATIONS CONCENTRATION (AGCM)

(Leading to the Bachelor of Science in Agriculture Degree)

Agricultural Communications Concentration prepares students for careers in agricultural communications and related fields. This curriculum provides an opportunity for students to combine technical agriculture with Agricultural Education, Journalism, Professional Communications, and Business Communications. Possible career areas include: agricultural information agencies; newspaper writing and editing; magazine feature writing and editing; agricultural related publications; public relations; advertising and sales; environmental reporting; and Agricultural Extension.

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 1200 Introductory Animal Science</td>
<td>3</td>
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<tr>
<td>AGRN 1100 Plant Science</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
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<tr>
<td>BIOL 1110 or 1120</td>
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<tr>
<td>MATH 1130 College Algebra</td>
<td>3</td>
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<tr>
<td>MATH 1630 Finite Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1010 Introduction to Chemistry I</td>
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<td>CHEM 1020 Introduction to Chemistry II</td>
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</tr>
<tr>
<td>AGR 1020 Connections to Agriculture</td>
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(AGBE, AGED, AGET, AGHT, AGRN and ANS)

Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>AGRN 2210 Soils</td>
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<tr>
<td>AGED 2120 Introduction to Agricultural and Extension Education</td>
<td>3</td>
</tr>
<tr>
<td>JOUR 2200 Mass Communication in a Changing Society</td>
<td>3</td>
</tr>
<tr>
<td>JOUR 2220 News Reporting &amp; Copy Editing</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2010 Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
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Upper Division Business or Economics Electives 1

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>JOUR 2200 Mass Communication in a Changing Society</td>
<td>3</td>
</tr>
<tr>
<td>JOUR 2220 News Reporting &amp; Copy Editing</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2010 Principles of Microeconomics</td>
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</tr>
<tr>
<td>Total</td>
<td>9</td>
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</table>

Upper Division Agriculture Elective 1

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRN 2210 Soils</td>
<td>3</td>
</tr>
<tr>
<td>JOUR 2200 Mass Communication in a Changing Society</td>
<td>3</td>
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<tr>
<td>JOUR 2220 News Reporting &amp; Copy Editing</td>
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<tr>
<td>ECON 2010 Principles of Microeconomics</td>
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</tr>
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Electives 1

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRN 2210 Soils</td>
<td>3</td>
</tr>
<tr>
<td>JOUR 2200 Mass Communication in a Changing Society</td>
<td>3</td>
</tr>
<tr>
<td>JOUR 2220 News Reporting &amp; Copy Editing</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2010 Principles of Microeconomics</td>
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</tr>
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<td>Total</td>
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</table>

Total 28-29

Junior Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ANS 1210 Introductory Animal Science Lab</td>
<td>1</td>
</tr>
<tr>
<td>BMGT 3720 Business Communication I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2020, PSY 2010, or SOC 1010</td>
<td>3</td>
</tr>
<tr>
<td>PC 3500 Web Site Construction/The Rhetoric of Internet Publishing</td>
<td>3</td>
</tr>
<tr>
<td>Humanities and/or Fine Arts Electives 2</td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
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<tr>
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</table>

Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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</thead>
<tbody>
<tr>
<td>AGR 4930 Senior Seminar</td>
<td>3</td>
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<tr>
<td>AGED 4200 Methods &amp; Techniques of Teaching in Agricultural and Extension Education</td>
<td>3</td>
</tr>
<tr>
<td>AGED 4300 Development of Youth Programs in Agricultural &amp; Extension Education</td>
<td>3</td>
</tr>
<tr>
<td>AGED 4150 Communications &amp; Public Relations in Agricultural &amp; Extension Education</td>
<td>3</td>
</tr>
<tr>
<td>AGCM 4850 Internship in Agricultural Communications</td>
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<tr>
<td>AGCM 4860 Internship in Agricultural Communications</td>
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</tr>
<tr>
<td>Upper Division Ag Electives 1</td>
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<td>Electives</td>
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</tr>
<tr>
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<td>29</td>
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</table>

AGRICULTURAL EDUCATION CONCENTRATION (AGED)

(Leading to the Bachelor of Science in Agriculture Degree)

Agricultural Education prepares students for careers as high school agricultural education instructors, Agricultural Extension agents, and other related fields. Students learn to evaluate community needs and how to implement an educational program.

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 1200 Introductory Animal Science</td>
<td>3</td>
</tr>
<tr>
<td>ANS 1210 Introductory Animal Science Lab</td>
<td>1</td>
</tr>
<tr>
<td>AGRN 1100 Plant Science</td>
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(AGBE, AGED, AGET, AGHT, AGRN and ANS)

Sophomore Year

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>AGED 3010 Professional Leadership Development...</td>
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<tr>
<td>Upper Division Ag Elective 2</td>
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<tr>
<td>Electives</td>
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</tr>
<tr>
<td>Total</td>
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Upper Division Business or Economics Electives 2

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>AGED 3010 Professional Leadership Development...</td>
<td>3</td>
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<tr>
<td>Upper Division Ag Elective 2</td>
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<td>Electives</td>
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<td>30</td>
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</tbody>
</table>

Upper Division Agriculture Elective 2

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGED 3010 Professional Leadership Development...</td>
<td>3</td>
</tr>
<tr>
<td>Upper Division Ag Elective 2</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
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<tr>
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<td>30</td>
</tr>
</tbody>
</table>

MBA Electives 2

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>BMGT 3720 Business Communication I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2020, PSY 2010, or SOC 1010</td>
<td>3</td>
</tr>
<tr>
<td>PC 3500 Web Site Construction/The Rhetoric of Internet Publishing</td>
<td>3</td>
</tr>
<tr>
<td>Humanities and/or Fine Arts Electives 2</td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
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</tr>
<tr>
<td>Total</td>
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</tbody>
</table>
Tennessee Technological University

AGRN 1110 Plant Science Lab .......................................1
ENGL 1010 Writing I ....................................................3
ENGL 1020 Writing II ....................................................3
BIOL 1110 or 1120 ....................................................4
MATH 1130 College Algebra ..............................................3
MATH 1630 Finite Mathematics ........................................3
CHEM 1010 Introduction to Chemistry I ..........................3
CHEM 1020 Introduction to Chemistry II ..........................3
AG 1020 Connections to Agriculture ...............................1
Total 33

Sophomore Year  sem. hrs.
AGRN 2210 Soils ..........................................................3
AGET 2110 or 3110 ..........................................................3
AGED 2120 Introduction to Agricultural and Extension Education ................................................ 3
ECON 2010 Principles of Microeconomics ........................................3
ECON 2020, PSY 2010, or SOC 1010 ..................................3
ENGL 2130, 2230, or 2330 .................................................3
EDPY 2200 Educational Psychology ..................................3
HIST 2010 American History I ...........................................3
HIST 2020 American History II ..........................................3
SPCH 2410 or PC 2500 ...................................................3
Total 30

Junior Year  sem. hrs.
ANS 3130 Animal Breeding ................................................3
AGHT 3410, 4410, or 4420 ................................................3
AGED 4 110 Methods of Teaching Agriscience ......................3
AGBE 2100 Economics of Agriculture ................................3
EDPY 3300 Evaluation & Guidance ..................................3
SPED 3000 Teaching Persons with Disabilities in the Regular Classroom ................................................ 3
AGED 3300 Teaching methods of Agriculture Tasks ...............3
Science Elective .............................................................3
Total 30

Senior Year  sem. hrs.
AG 4930 Senior Seminar ..................................................2
AGED 4200 Methods and Techniques of Teaching in Agricultural and Extension Education ..............................3
AGED 4300 Development of Young Programs in Agricultural and Extension Education .....................................3
Upper-division Agriculture Elective* ..................................3
AGED 4870 Student Teaching in Agricultural Education I ..........................................................................5
AGED 4880 Student Teaching in Agricultural Education II ...................................................................5
AGED 4890 Seminar: Education & Society ................................2
Electives ..............................................................................4
Total 27

* Select from the University approved list.

2 No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGRN and ANS)

2011-12 Undergraduate Catalog

AGRITOURISM CONCENTRATION (ATOU)

(Leading to the Bachelor of Science in Agriculture)

Agritourism provides a cutting edge option for students looking to enter the agricultural industry or return to a home operation and increase the viability of maintaining their cultural heritage. Graduates enter careers as Agritourism enterprise managers, entrepreneurs in their own enterprise, non-formal educators serving as developers of educational activities and programs for Agritourism sites. In addition, some of our students will seek entrance into graduate school to open even more doors through Cooperative Extension and the USDA.

Freshman Year  sem. hrs.
AGBE 1120 Introduction to Agritourism ....................................3
AGRN 1100 Plant Science ....................................................4
ANS 1200 Introductory Animal Science ..................................3
BIOL 1110 General Zoology ................................................3
CHEM 1020 Introduction to Chemistry I ..................................4
ENGL 1010 Writing I ...........................................................3
ENGL 1020 Writing II ...........................................................3
MATH 1130, 1530, 1630, 1830, or 1910 ................................3
SOC 1010 Introduction to Sociology ......................................3
AG 1020 Connections to Agriculture .....................................1
Total 30

Sophomore Year  sem. hrs.
ACCT 2110 Principles of Financial Accounting ........................3
AGBE 2010 World Food and Society .....................................3
AGBE 2100 Economics of Agriculture ................................3
AGET 2110 or 3110 ............................................................3
DS 2810 Computer Applications in Business ........................3
ECON 2010 Principles of Microeconomics ............................3
ENGL 2130, 2230 or 2330 ...................................................3
HIST 2010 American History I .............................................3
HIST 2020 American History II .............................................3
MIT 2000 Occupational Safety ..............................................2
SPCH 2410 Introduction to Speech Communication ........................................3
Total 32

Junior Year  sem. hrs.
AGBE 3020 Agriculture and Heritage Based Tourism ................3
AGBE 3110 Agricultural Marketing and Futures ........................3
AGET 3320 Small Power Equipment ....................................3
AGHT 3400 Landscape Horticulture ......................................3
AGHT 3470 Landscape Plant Materials ..................................3
AGRN 2210 Soils ...............................................................3
Humans/Social Science Electives ...........................................6
WFS 3130 General Ecology ..................................................4
Total 28

Senior Year  sem. hrs.
AGBE 4030 Agribusiness Management ..................................3
AGBE 4930 Ag Business Special Topic ..................................3
AGR 3950 Advanced Internship ............................................3
BMGT 3630 Human Resource Management ..........................3
LAW 4720 Business Law .....................................................3
MKT 3900 Entrepreneurship/Small Business ........................3
MKT 4530 Consumer Behavior ............................................3
SOC 3720 Rural Sociology ..................................................3
WFS 4700 Habitat Management ..........................................3
Tennessee Technological University

Electives .......................................................... 3
Total ................................................................. 30

AGRICULTURAL ENGINEERING TECHNOLOGY
CONCENTRATION (AGET)

(Leading to the Bachelor of Science in Agriculture Degree)

Agricultural Engineering Technology provides basic training in engineering and agriculture. Students are prepared to solve problems related to agricultural production and processing systems and the management and conservation of agricultural land and water resources. Graduates pursue careers in food and fiber handling and processing facilities, farm machinery sales and service, management of large mechanized farms, and other sectors of Agricultural Engineering Technology.

Freshman Year sem. hrs.

ANS 1200 Introductory Animal Science .............................. 3
ANS 1210 Introductory Animal Science Lab ....................... 1
AGRN 1100 Plant Science ........................................... 3
AGRN 1110 Plant Science Lab ...................................... 1
ENGL 1010 Writing I ............................................... 3
ENGL 1020 Writing II ............................................... 3
CHEM 1010, 1020 or 1110, 1120 ................................. 8
MATH 1130, 1530, 1630, 1730, 1830, or 1910 (Select two) ........................................ 6-7
CSC 1100 or DS 2810 ................................................ 3
AGR 1020 Connections to Agriculture ................................ 1
Total ...................................................................... 32-35

Sophomore Year sem. hrs.

AGET 2110 Engineering Technology in Agriculture .................... 3
AGBE 2100 Economics of Agriculture ................................ 3
AGRN 2210 Soils ....................................................... 3
Biol 1110, 1120, or PHYS 2010 (Select two) .......................... 8
ACCT 2110 Principles of Financial Accounting ...................... 3
ENGL 2130, 2230, or 2330 ........................................... 3
SPCH 2410 or PC 2500 ............................................. 3
Social/Behavioral Science Electives 1 .............................. 6
Total ...................................................................... 32

Junior Year sem. hrs.

ACCT 3720 Survey of Accounting ...................................... 3
AGET 3110 Natural Resource Systems ................................ 3
AGET 3320 Small Power Equipment .................................. 3
AGET 3620 Computer Aided Design in Agriculture .................. 3
Upper-division Agriculture Electives 2 .............................. 6
Humanities/Fine Arts Electives 3 ..................................... 6
HIST 2010 American History I ....................................... 3
HIST 2020 American History II .................................... 3
Total ...................................................................... 30

Senior Year sem. hrs.

AGBE 3110 Agricultural Marketing and Futures ............... 3
AGET 4220 Agricultural Machinery & Tractors .................... 3
AGET 4720 Agricultural Processing .................................. 3
AGET 4610 Greenhouse Structures & Landscaping Equipment ........................................ 3
Upper-division Agriculture Electives 4 .............................. 3

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AGET 3510, 3560, 4620, 4940, 4950; AGR 3960, 4920, 4960, 4970, 4980 (Select two) ............. 6
AGR 4930 Senior Seminar ........................................ 2
Electives .......................................................... 1-4
Total ................................................................. 24-27

1 Select two from the University approved social/behavioral science list.
2 No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)
3 Select two courses from the University approved Fine Arts list.
4 Select course from any Agriculture discipline.

AGRONOMY AND SOILS CONCENTRATION (AGRN)

(Leading to the Bachelor of Science in Agriculture Degree)

Agronomy and Soils students study the complex processes of plants and composition of soil in which they grow. Areas of interest are crop science and soil science. Graduates pursue careers as agronomists; Extension agents; Natural Resources Conservation Service employees; and herbicide, fertilizer, and seed industry research and development specialists and sales representatives.

Freshman Year sem. hrs.

ANS 1200 Introductory Animal Science .............................. 3
ANS 1210 Introductory Animal Science Lab ....................... 1
AGRN 1100 Plant Science ........................................... 3
AGRN 1110 Plant Science Lab ...................................... 1
MATH (Any two) 1130, 1530, 1630, 1830, or 1910 ......... 6-7
ENGL 1010 Writing I ............................................... 3
ENGL 1020 Writing II ............................................... 3
CHEM 1010, 1020 or 1110, 1120 ................................. 8
CSC 1100 or DS 2810 ................................................ 3
AGR 1020 Connections to Agriculture ............................... 1
Total ...................................................................... 32-33

Sophomore Year sem. hrs.

AGBE 2100 Economics of Agriculture ............................... 3
ENGL 2130, 2230, or 2330 ........................................... 3
HIST 2010 American History I ....................................... 3
HIST 2020 American History II .................................... 3
AGET 2110 or 3110 ................................................... 3
BIOL 1120 General Botany ......................................... 4
AGRN 2210 Soils ....................................................... 3
AGRN 3230 or 4230 .................................................. 4-3
AGRN 3100 Turfgrass Management ............................... 3
Social/Behavioral Science Electives 4 .............................. 3
Total ...................................................................... 31-32

Junior Year sem. hrs.

AGRN 3020 Crops in Sustainable Systems ........................ 3
AGHT 3030 Integrated Pest Management ........................ 3
CHEM 3005 or 3710 .................................................. 4-3
SPCH 2410 or PC 2500 ............................................. 3
BIOL 3020 or 3330 .................................................. 4-3
Humanities/Fine Arts Electives 3 ..................................... 3
Upper-division Agriculture Elective 3 .............................. 3
AGRN 4110 Forage Crops Production & Management .......... 4

1830, or 1910 ................................................... 6-7
Select two math courses from the above list. No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)

Upper-division Agriculture Electives¹ .......................... 6
Upper-division Agriculture Elective² .......................... 3
Social/Behavioral Science Elective³ .................................. 3
Humanities/Fine Arts Elective³ .................................. 3
AGR 2210 Soils ................................................................ 3
Total 30-31

Senior Year  sem. hrs.
AGRN 4100 Weed Science ........................................ 3
AGRN 4210 Soil Fertility & Fertilizers .......................... 3
AGR 4930 Senior Seminar ......................................... 2
AGRN 4120, ANS 3130, or BIOL 3810 .................. 3-4
Upper-division Agriculture Electives¹ ....................... 6
Humanities/Fine Arts Elective³ .................................. 3
Electives ..................................................................... 4-9
Total 25-29

¹ No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)
² Select two from University approved list.
³ Select two from University approved list.

ANIMAL AND PRE-VETERINARY SCIENCE
CONCENTRATION

Option I: Animal Science (ANSC)

(Leading to the Bachelor of Science in Agriculture Degree)

Animal Science deals with all phases of the livestock and dairy industry. Areas emphasized are nutrition, physiology, genetics, management technology, quality control, and environmental regulations. Graduates enter careers in farm management, Extension Service, food quality control, governmental health agencies, farm credit institutions, and agricultural sales and management.

Freshman Year  sem. hrs.
AGBE 2100 Economics of Agriculture .......................... 3
ANS 1200 Introductory Animal Science .......................... 3
ANS 1210 Introductory Animal Science Lab .................. 1
AGRN 1100 Plant Science ........................................... 3
AGRN 1110 Plant Science Lab ...................................... 1
MATH 1130, 1530, 1630, 1830, or 1910¹ ................... 3-4
BIOL 1110 General Zoology ....................................... 4
CSC 1100 or DS 2810 .................................................. 3
ENGL 1010 Writing I ................................................... 3
ENGL 1020 Writing II ................................................... 3
ANS 2020 Livestock Management ................................ 3
AGR 1020 Connections to Agriculture ......................... 1
Total 31-32

Sophomore Year  sem. hrs.
AGET 2110 or 3110 ................................................... 3
ENGL 2130, 2230 or 2330 ............................................. 3
HIST 2010 American History I .................................... 3
HIST 2020 American History II .................................... 3
MATH 1130, 1530, 1630, 1830, or 1910¹ ................... 3-4
ANS 2110 Livestock Evaluation .................................... 3
CHEM 1120 General Chemistry II ............................... 4
ENGL 1010 Writing I ................................................... 3
ENGL 1020 Writing II ................................................... 3
ANS 2020 Livestock Management ................................ 3
SPCH 2410 or PC 2500 ................................................. 3
Elective ..................................................................... 0-2
Total 32-33

Junior Year  sem. hrs.
ANS 3010 Animal Nutrition ......................................... 3

Option II: Pre-Veterinary Science (ANS2)

(Leading to the Bachelor of Science in Agriculture Degree)

The Pre-Veterinary Science curriculum is designed to enable a student to enter a College of Veterinary Medicine.

Freshman Year  sem. hrs.
ANS 1200 Introductory Animal Science .......................... 3
ANS 1210 Introductory Animal Science Lab .................. 1
AGRN 1100 Plant Science ........................................... 3
AGRN 1110 Plant Science Lab ...................................... 1
MATH 1130, 1530, 1630, 1830, or 1910¹ ................... 3-4
BIOL 1110 General Zoology ....................................... 4
ENGL 1010 Writing I ................................................... 3
ENGL 1020 Writing II ................................................... 3
ANS 2020 Livestock Management ................................ 3
SPCH 2410 or PC 2500 ................................................. 3
Elective ..................................................................... 0-2
Total 33-34

Sophomore Year  sem. hrs.
AGET 2110 or 3110 ................................................... 3
ENGL 2130, 2230, or 2330 ............................................. 3
MATH 1130, 1530, 1630, 1830, or 1910¹ ................... 3-4
BIOL 3140 Cellular Biology ......................................... 4

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ANS 3020 Feeds & Feeding ......................................... 3
ANS 3130 Animal Breeding ......................................... 3
ANS 3140 Reproduction in Farm Animals ..................... 3
ANS 3150 Common Diseases & Parasites of Domestic Animals ........................................... 3
CHEM 3005 or 3710 ..................................................... 4-3
Upper-division Agriculture Elective² .......................... 3
Social/Behavioral Science Elective³ .......................... 3
Humanities/Fine Arts Elective³ .................................. 3
Total 30-31

Senior Year  sem. hrs.
AGRN 4100 Weed Science ........................................ 3
AGRN 4210 Soil Fertility & Fertilizers .......................... 3
AGR 4930 Senior Seminar ......................................... 2
AGRN 4120, ANS 3130, or BIOL 3810 .................. 3-4
Upper-division Agriculture Elective² .......................... 3
Social/Behavioral Science Elective³ .......................... 3
Humanities/Fine Arts Elective³ .................................. 3
AGR 2210 Soils ................................................................ 3
Total 25-29

¹ Select two math courses from the above list.
² No more than one course from any Agriculture discipline. (AGBE, AGED, AGET, AGHT, AGRN and ANS)
³ Select two courses from the University approved social/behavorial science list and two courses from the University approved humanities and/or fine arts list (Page 36-37).
Tennessee Technological University

CHEM 3010 Organic Chemistry I ...................................... 4
CHEM 3020 Organic Chemistry II .................................... 4
SPCH 2410 or PC 2500 ..................................................... 3
AGBI 2100 Economics of Agriculture ............................ 3
BIOL 1120 General Botany .............................................. 4
Total 31-32

Junior Year

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<td>ANS 3130 Animal Breeding</td>
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<td>ANS 3140 Reproduction in Farm Animals</td>
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<td>ANS 3150 Common Diseases &amp; Parasites of Domestic Animals</td>
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<td>PHYS 2010 Algebra-based Physics I</td>
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<td>PHYS 2020 Algebra-based Physics II</td>
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Senior Year

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<td>CHEM 4610 General Biochemistry</td>
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<td>4000-Level AGRN production courses</td>
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<td>HIST 2010 American History I</td>
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1 Select two math courses from the above list.
2 Select two courses from the University approved social/behavioral science list and two courses from the University approved humanities and/or fine arts list.
3 No more than one course from any Agriculture discipline. (AGBI, AGET, AGRN and ANS)

ENVIRONMENTAL AGRISCIENCE CONCENTRATION (AGES)

(Leading to the Bachelor of Science in Agriculture Degree)

Environmental Agriscience is an environmentally oriented curriculum that offers courses in soils, geology, ecology, hydrology, and biology in an environmental context in addition to traditional agriculture courses. Graduates in the Environmental Agriscience concentration could work in fields such as water quality, reclamation, and developing environmental impact statements. Environmental consulting firms, the EPA, state health departments, the Natural Resources Conservation Service, and the Agricultural Extension Service are a few examples of possible employers.

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ANS 1200 Introductory Animal Science</td>
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<td>AGRN 1100 Plant Science</td>
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<td>MATH 1130, 1530, 1630, 1830,</td>
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<tr>
<th>Course</th>
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<tbody>
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<td>CHEM 1010, 1020 or 1110, 1120</td>
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<tr>
<td>AGRN 2210 Soils</td>
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<tr>
<td>GEOL 1040 The Dynamic Earth</td>
<td>4</td>
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<tr>
<td>GEOL 1045 Earth Environment Resources &amp; Society</td>
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Sophomore Year

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<tr>
<th>Course</th>
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<td>AGRN 3230 Environmental Soil Science</td>
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<td>AGRN 4220 Environmental Soil Chemistry</td>
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<td>BIOL 3130 or PHY 2010</td>
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<td>SPCH 2410 or PC 2500</td>
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<tr>
<td>AGRN 4210, BIOL 4840, or GEOL 4150 (select two)</td>
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<td>Humanities/Fine Arts Elective2</td>
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<tr>
<td>Upper-division Agriculture Elective1</td>
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<tr>
<td>Social/Behavioral Science Elective2</td>
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<td>Total 29-30</td>
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Junior Year

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<tr>
<th>Course</th>
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<tr>
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<td>AGRN 4230 Soil Classification</td>
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<td>AGRN 4930 Senior Seminar</td>
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<td>Social/Behavioral Science Elective3</td>
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<td>Upper-division Agriculture Electives1</td>
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<td>Humanities/Fine Arts Elective2</td>
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</table>

1 No more than one course from any Agriculture discipline. (AGBE, AGET, AGRN and ANS)
2 Select two from the University approved list.
3 Select two from the University approved list.

HORTICULTURE CONCENTRATION (HORT)

(Leading to the Bachelor of Science in Agriculture Degree)

Horticulture combines training in the biological and physical sciences with sound plant cultural practices. Training is offered in plant identification, production and handling of greenhouse and nursery crops and landscape design and management. Graduates enter careers in management, production, processing, sales, education, and governmental agencies related to the green industries.
Tennessee Technological University

### Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>ANS 1200 Introductory Animal Science</td>
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<td>ENGL 1010 Writing I</td>
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<td>ENGL 1020 Writing II</td>
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<td>CHEM 1010, 1020 or 1110, 1120</td>
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<td>MATH 1130, 1530, 1630, 1830, or 1910</td>
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### Sophomore Year

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<th>Course</th>
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<td>AGBE 2100 Economics of Agriculture</td>
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<td>AGRN 2210 Soils</td>
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### Junior Year

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<td>AGHT 3030 Integrated Pest Management</td>
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<td>AGHT 3400 Landscape Horticulture</td>
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<td>AGHT 3410 Plant Propagation</td>
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<td>AGHT 3450 Dendrology</td>
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<td>AGHT 3470 Landscape Plant Materials</td>
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<td>AGHT elective (may use 1 AGR 3940/50/60 internship)</td>
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### Senior Year

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<td>AGHT 4410 Nursery Management</td>
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<td>AGHT 4420 Greenhouse Management &amp; Crop</td>
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<td>Production</td>
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<td>AGRN 4210 Soil Fertility &amp; Fertilizers</td>
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<td>AGET 4610 Greenhouse Structures &amp; Landscaping Equipment</td>
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① No more than one course from any Agriculture discipline.
(AGBE, AGED, AGET, AGHT, AGRN and ANS)
② Select two from University approved list.
③ Select two from University approved list.

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**NURSERY AND LANDSCAPE MANAGEMENT CONCENTRATION (NLMT)**

*(Leading to the Bachelor of Science in Agriculture Degree)*

Nursery and Landscape Management provides students an opportunity to combine agribusiness management training and horticulture training for managerial positions in the nursery and landscaping industries.

### Freshman Year

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<tr>
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<td>MATH 1130, 1530, 1630, 1830, or 1910</td>
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### Sophomore Year

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>AGBE 2100 Economics of Agriculture</td>
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<td>AGRN 2210 Soils</td>
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<td>BIOL 1120 General Botany</td>
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### Junior Year

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>AGET 3110 Natural Resource Systems</td>
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<td>AGHT 3400 Landscape Horticulture</td>
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<td>AGHT 3410 Plant Propagation</td>
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<tr>
<td>AGHT 3450 Dendrology</td>
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<td>AGHT 3470 Landscape Plant Materials</td>
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<td>Humanities/Fine Arts Elective②</td>
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<td>BIOL 3200, 3330, 3810, 4250, 4310, or 4320</td>
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### Senior Year

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<td>AGBE 4030 Agribusiness Management</td>
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<td>AGHT 4410 Nursery Management</td>
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<td>AGHT 4420 Greenhouse Management &amp; Crop</td>
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<td>AGHT elective</td>
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<td>AGRN 4210 Soil Fertility &amp; Fertilizers</td>
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<tr>
<td>AGET 4610 Greenhouse Structures &amp; Landscaping Equipment</td>
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① No more than one course from any Agriculture discipline.
(AGBE, AGED, AGET, AGHT, AGRN and ANS)
Choose two courses (six hours) from the following: LAW 3510 or 3630, FIN 3210 or 3610, LAW 4720 or 3810, or MKT 3400, 3430, or 4500.

TURFGRASS MANAGEMENT CONCENTRATION (TMGT)

(Leading to the Bachelor of Science in Agriculture Degree)

Turfgrass Management provides basic training in the science and culture of managing turfgrasses and the economics and business management principles related to the turf industry. Graduates are prepared to pursue careers in management of athletic turf, golf courses, municipal, industrial, home lawns and other types of turf and related business.

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
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<td>ANS 1200 Introductory Animal Science</td>
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<tr>
<td>ANS 1210 Introductory Animal Science Lab</td>
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<td>AGRN 1100 Plant Science</td>
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<td>AGRN 1110 Plant Science Lab</td>
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<td>CHEM 1010, 1020 or 1110, 1120</td>
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Sophomore Year

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<tr>
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<td>HIST 2020 American History II</td>
<td></td>
<td>3</td>
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<tr>
<td>ECON 2010 Principles of Microeconomics</td>
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<tr>
<td>ECON 2020 Principles of Macroeconomics</td>
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</tr>
<tr>
<td>ACCT 2110 Principles of Financial Accounting</td>
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<td>ACCT 2120 Principles of Managerial Accounting</td>
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Junior Year

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<tbody>
<tr>
<td>AGET 3320 Small Power Equipment</td>
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<td>AGRN 3100 Turfgrass Management</td>
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<td>AGHT 3470 Landscape Plant Materials</td>
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<td>AGBE 3400 Agricultural Finance</td>
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<td>SPCH 2410 or PC 2500</td>
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<td>Humanities/Fine Arts Elective compromises</td>
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Sophomore Year

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<td>Communication Elective</td>
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<td>Any General Education Math</td>
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<tr>
<td>ART 1010 Two-Dimensional Design</td>
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<td>3</td>
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<tr>
<td>ART 2010 Three-Dimensional Design</td>
<td></td>
<td>3</td>
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<tr>
<td>ART 2310 Drawing I, Introduction</td>
<td></td>
<td>3</td>
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<tr>
<td>ARED 2020 Art Education Theory</td>
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<td>2</td>
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<td>Social/Behavioral Science Electives</td>
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Junior Year

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<tr>
<td>HIST 2010 American History I</td>
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<td>HIST 2020 American History II</td>
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<td>EDPS 2200 Educational Psychology</td>
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<td>ARED 3165 Secondary Practicum</td>
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<td>ART 3130, 3150, 3160, 4100, or 4170</td>
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<td>ART 3205 Methods and Media</td>
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<td>ART 2070 Digital Art Basics</td>
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<tr>
<td>Studio emphasis (from drawing, painting,</td>
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<td>clay, and sculpture)</td>
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**Tennessee Technological University**

### 2011-12 Undergraduate Catalog

<table>
<thead>
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<tbody>
<tr>
<td>ART 2060 35mm Photography</td>
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<td>ARED 4871 Residency I</td>
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<tr>
<td>ARED 4872 Professional Seminar</td>
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<td>ARED 4881 Residency II</td>
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<td>ARED 4882 Professional Seminar II</td>
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<td>Studio emphasis (from drawing, painting, clay, sculpture)</td>
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1. This course not included in 120-hour curriculum.
2. Majors in BFA concentrations in clay, fibers, glass, metals, painting and wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses, and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.
3. Art studio electives (eight semester hours) are defined as any art studio course not applied to other requirements. Courses transferred from other institutions will be subject to departmental review.

**FINE ARTS (ART)**

### CLAY CONCENTRATION (BFAC)

**Leading to the Bachelor of Fine Arts Degree**

#### Freshman Year

<table>
<thead>
<tr>
<th>ENGL 1010 Writing I</th>
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<tbody>
<tr>
<td>ENGL 1020 Writing II</td>
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<td>Natural Science Electives</td>
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<tr>
<td>Any General Education Math</td>
<td>3</td>
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<tr>
<td>Social/Behavioral Science Electives</td>
<td>6</td>
</tr>
<tr>
<td>ART 1010 Two-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 2010 Three-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 2310 Drawing I, Introduction</td>
<td>3</td>
</tr>
<tr>
<td>ART 2320 or 2330</td>
<td>3</td>
</tr>
<tr>
<td>ART 2510 Introduction to Clay</td>
<td>3</td>
</tr>
<tr>
<td>UNAR 1020, UNIV 1020 or equivalent</td>
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#### Sophomore Year

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<th>ENGL 2130, 2230, or 2330</th>
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<tbody>
<tr>
<td>ART 2410, 2610, 2710, 2810, or 2910 (Select two)</td>
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<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
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<td>HIST 2020 American History II</td>
<td>3</td>
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<tr>
<td>ART 2070 Digital Art Basics</td>
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<tr>
<td>ART 2120 Art History II</td>
<td>3</td>
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<tr>
<td>ART 3510 Clay on Wheels</td>
<td>3</td>
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<tr>
<td>ART 3511 Intermediate Handbuilding</td>
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#### Junior Year

| ART 3130 Twentieth-Century Art | 3 |
| ART 3520 Advanced Clay Studio | 3 |
| ART 3521 Advanced Clay Studio | 3 |
| ART 3520 or 3521 | 3 |
| ART 2110, 3150, 3160, 4040, 4100, or 4170 (Select two) | 6 |
| ART 3520, 3521, or 3530 | 3 |
| ART Studio Electives | 2 |
| SPCH 2410 or PC 2500 | 3 |
| Total | 26 |

#### Senior Year

| ART 4510 Senior Thesis in Clay | 12 |

**FIBERS CONCENTRATION (BFAF)**

**Leading to the Bachelor of Fine Arts Degree**

#### Freshman Year

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<td>Natural Science Electives</td>
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<tr>
<td>Any General Education Math</td>
<td>3</td>
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<tr>
<td>ART 1010 Two-Dimensional Design</td>
<td>3</td>
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<tr>
<td>ART 2010 Three-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 2310 Drawing I, Introduction</td>
<td>3</td>
</tr>
<tr>
<td>ART 2320 or 2330</td>
<td>3</td>
</tr>
<tr>
<td>ART 2510 Introduction to Fibers</td>
<td>3</td>
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<td>UNAR 1020, UNIV 1020 or equivalent</td>
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#### Sophomore Year

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<tr>
<td>ART 2410, 2510, 2710, 2810, or 2910 (Select two)</td>
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<td>HIST 2010 American History I</td>
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<td>HIST 2020 American History II</td>
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<td>ART 2120 Art History II</td>
<td>3</td>
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<tr>
<td>ART 3610 Weaving I</td>
<td>3</td>
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<tr>
<td>ART 3620 Surface Design I</td>
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#### Junior Year

| ART 3130 Twentieth-Century Art | 3 |
| ART 2110, 3150, 3160, 4040, 4100, or 4170 (Select two) | 6 |
| ART 3630, 3631 or 4640 | 3 |
| ART 3610, 3611, 3620 or 3621 | 3 |
| ART Studio Electives | 8 |
| SPCH 2410 or PC 2500 | 3 |
| ART 3611 Weaving II | 3 |
| ART 3621 Surface Design II | 3 |
| Total | 32 |
1 This course not included in 120-hour curriculum.
2 Majors in BFA concentrations in clay, fibers, glass, metals, painting, and wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses, and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.
3 Art studio electives (eight semester hours) are defined as any art studio course not applied to other requirements. Courses transferred from other institutions will be subject to departmental review.
4 Art studio electives, upper division outside concentration. Art studio courses more advanced than an introductory course in any studio other than that of the concentration can be used for these electives. Courses transferred from other institutions will be subject to departmental review.

GLASS CONCENTRATION (BFAG)

(Leading to the Bachelor of Fine Arts Degree)

Senior Year

<table>
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<tr>
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1 Majors in BFA concentrations in clay, fibers, glass, metals, painting, and wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses, and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

2 This course not included in 120-hour curriculum.

3 Art studio electives (eight semester hours) are defined as any art studio course not applied to other requirements. Courses transferred from other institutions will be subject to departmental review.

4 Art studio electives, upper division outside concentration. Art studio courses more advanced than an introductory course in any studio other than that of the concentration can be used for these electives. Courses transferred from other institutions will be subject to departmental review.

METALS CONCENTRATION (BFAM)

(Leading to the Bachelor of Fine Arts Degree)

Senior Year

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1 Majors in BFA concentrations in clay, fibers, glass, metals, painting, and wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses, and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

2 This course not included in 120-hour curriculum.

3 Art studio electives (eight semester hours) are defined as any art studio course not applied to other requirements. Courses transferred from other institutions will be subject to departmental review.

4 Art studio electives, upper division outside concentration. Art studio courses more advanced than an introductory course in any studio other than that of the concentration can be used for these electives. Courses transferred from other institutions will be subject to departmental review.

Tennessee Technological University
### Tennessee Technological University

#### 2011-12 Undergraduate Catalog

<table>
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<th>Junior Year</th>
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<tbody>
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<td>ART 3811 Metals Studio—Metalsmithing</td>
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<tr>
<td>ART 3821 Metals Studio—Blacksmithing</td>
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<tr>
<td>ART 3811 or 3821</td>
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<tr>
<td>ART 3830 or 4840</td>
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<td><strong>Total</strong></td>
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</table>

#### Senior Year | sem. hrs. |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Social/Behavioral Science Electives</td>
<td>6</td>
</tr>
<tr>
<td>Humanities/Fine Arts Electives</td>
<td>6</td>
</tr>
<tr>
<td>ART 4810 Senior Thesis in Metals</td>
<td>12</td>
</tr>
<tr>
<td>ART Studio Electives (upper-division, not in concentration)</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

1. This course not included in 120-hour curriculum.
2. Majors in BFA concentrations in clay, fibers, glass, metals, painting, and wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses, and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.
3. Art studio electives (eight semester hours) are defined as any art studio course not applied to other requirements. Courses transferred from other institutions will be subject to departmental review.
4. Art studio electives, upper division outside concentration. Art studio courses more advanced than an introductory course in any studio other than that of the concentration can be used for these electives. Courses transferred from other institutions will be subject to departmental review.

#### PAINTING CONCENTRATION (BFAP)

(Leading to the Bachelor of Fine Arts Degree)

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>Any General Education Math</td>
<td>3</td>
</tr>
<tr>
<td>Social/Behavioral Science or Humanities/Fine Arts Electives</td>
<td>6</td>
</tr>
<tr>
<td>ART 1010 Two-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 2010 Three-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 2310 Drawing I, Introduction</td>
<td>3</td>
</tr>
<tr>
<td>ART 2320 Drawing II</td>
<td>3</td>
</tr>
<tr>
<td>ART 2410 Painting I, Introduction</td>
<td>3</td>
</tr>
<tr>
<td>UNAR 1020, UNIV 1020 or equivalent</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 2510, 2610, 2710, 2810, or 2910</td>
<td>6</td>
</tr>
<tr>
<td>Natural Science Electives</td>
<td>8</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
</tbody>
</table>

#### WOOD CONCENTRATION (BFAW)

(Leading to the Bachelor of Fine Arts Degree)

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
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<tr>
<td>Natural Science Electives</td>
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<tr>
<td>Any General Education Math</td>
<td>3</td>
</tr>
<tr>
<td>ART 1010 Two-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 2010 Three-Dimensional Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 2310 Drawing I, Introduction</td>
<td>3</td>
</tr>
<tr>
<td>ART 2330 Technical Drawing</td>
<td>3</td>
</tr>
<tr>
<td>ART 2910 Introduction to Woodworking</td>
<td>3</td>
</tr>
</tbody>
</table>
**Tennessee Technological University**

UNAR 1020, UNIV 1020 or equivalent\(^1\) .......................... 1
Total ...................................................................................... 33

**Sophomore Year**  

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
<td>3</td>
</tr>
<tr>
<td>ART 2410, 2510, 2610, 2710, or 2810</td>
<td>3</td>
</tr>
<tr>
<td>(Select two)</td>
<td>6</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>ART 2070 Digital Art Basics</td>
<td>2</td>
</tr>
<tr>
<td>ART 2120 Art History II</td>
<td>3</td>
</tr>
<tr>
<td>ART 3910 Intermediate Wood Studio</td>
<td>3</td>
</tr>
<tr>
<td>ART 3911 Intermediate Wood Studio</td>
<td>3</td>
</tr>
<tr>
<td>ART 3930 or 4940</td>
<td>3</td>
</tr>
</tbody>
</table>
Total ...................................................................................... 29

**Junior Year**  

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 3130 Twentieth-Century Art</td>
<td>3</td>
</tr>
<tr>
<td>ART 2110, 3150, 3160, 4040, 4100, or 4170 (Select two)</td>
<td>6</td>
</tr>
<tr>
<td>ART 3920 Advanced Wood Studio</td>
<td>3</td>
</tr>
<tr>
<td>ART 3921 Advanced Wood Studio</td>
<td>3</td>
</tr>
<tr>
<td>ART 3930 or 4940</td>
<td>3</td>
</tr>
<tr>
<td>ART Studio Electives(^3)</td>
<td>8</td>
</tr>
<tr>
<td>SPCH 2410 or PC 2500</td>
<td>3</td>
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</tbody>
</table>
Total ...................................................................................... 29

**Senior Year**  

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social/Behavioral Science Electives</td>
<td>6</td>
</tr>
<tr>
<td>Humanities/Fine Arts Electives</td>
<td>6</td>
</tr>
<tr>
<td>ART 4910 Senior Thesis in Wood</td>
<td>12</td>
</tr>
<tr>
<td>ART Studio Electives (upper-division, not in concentration)(^4)</td>
<td>6</td>
</tr>
</tbody>
</table>
Total ...................................................................................... 30

\(^1\) This course not included in 120-hour curriculum.

\(^2\) Majors in BFA concentrations in clay, fibers, glass, metals, painting, and wood must have C or above in all art courses applied to fulfill requirements in the major. Art courses must also have the grade of C or above in order to serve as prerequisites for other art courses, and to be counted as completed in the sophomore assessment for recommendation to advance in the concentration.

\(^3\) Art studio electives (eight semester hours) are defined as any art studio course not applied to other requirements. Courses transferred from other institutions will be subject to departmental review.

\(^4\) Art studio electives, upper division outside concentration. Art studio courses more advanced than an introductory course in any studio other than that of the concentration can be used for these electives. Courses transferred from other institutions will be subject to departmental review.

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**BASIC BUSINESS (BBUS)**

**Freshman Year**  

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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</thead>
<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 1120 Programming for Engineers(^1)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1130 College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1830 Concepts of Calculus</td>
<td>3</td>
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</table>

**Sophomore Year**  

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 1910 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1920 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 1110 Engineering Graphics(^3)</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 1120 Programming for Engineers(^1)</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 1010, 1020, 1110, 1120</td>
<td>10</td>
</tr>
<tr>
<td>BIOL 1010, 1020, 2010, 2020</td>
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</tr>
<tr>
<td>DS 2810 Computer Applications in Business</td>
<td>3</td>
</tr>
<tr>
<td>Social/Behavioral Science Electives</td>
<td>6</td>
</tr>
<tr>
<td>Humanities elective(^2)</td>
<td>3</td>
</tr>
<tr>
<td>Non-business electives(^2)</td>
<td>4</td>
</tr>
</tbody>
</table>
Total ...................................................................................... 30

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**2011-12 Undergraduate Catalog**

**BASIC ENGINEERING (BE)**

(The following first-year curriculum is recommended for students who have not selected a specific engineering discipline.)

**Freshman Year**  

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 1020 Connections to Engineering &amp; Technology(^2)</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 1110 Engineering Graphics(^3)</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 1120 Programming for Engineers(^1)</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 1210 Introduction to Engineering</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 1040, 1045, 1060, 1070, 1080</td>
<td>15</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>SPCH 2410 or PC 2500</td>
<td>3</td>
</tr>
</tbody>
</table>
Total ...................................................................................... 34

\(^1\) Students should consult with their advisor prior to taking ENGR 1110, ENGR 1120, or CHEM 1120 to ensure the courses are applicable to the engineering disciplines in which the student has potential interest.

\(^2\) This course not included in 128-hour curriculum.
(Leading to the Bachelor of Science Degree)

Freshman Year

- BIOL 1000 Introduction to Biological Methods ............ 1
- BIOL 1050 Principles of Biology ............................... 3
- BIOL 1110 General Zoology ...................................... 4
- BIOL 1120 General Botany ......................................... 4
- ENGL 1010 Writing I ................................................. 3
- ENGL 1020 Writing II .............................................. 3
- CHEM 1110 General Chemistry I ................................. 4
- CHEM 1120 General Chemistry II ............................... 4
- MATH 1 ................................................................. 6
Total ...................................................... 13-24

Sophomore Year

- GEOL 1040, 1045; or GEOL 1040, 2000; or PHYS 2010, 2020 ................................................. 7-8
- HIST 2010 American History I ................................... 3
- HIST 2020 American History II .................................. 3
- Humanities/Fine Arts Electives ................................. 6
- ENGL 2130, 2230, or 2330 ....................................... 3
- PC 2500 Communicating in the Professions ................3
- MATH 1 ................................................................. 6
Total ...................................................... 28-29

Junior Year

- BIOL 3130 General Ecology .................................... 4
- BIOL 3140 Cellular Biology ....................................... 4
- BIOL 3200 General Microbiology ............................... 4
- BIOL 3810 General Genetics .................................... 4
- BIOL 3920 Biological Communication Skills ............... 3
- CHEM 3005 Elementary Organic Chemistry ............... 4
- Social/Behavioral Science Electives ........................... 6
Total ...................................................... 29

Senior Year

- Approved Biology and Chemistry courses* .................. 13-24
- Electives .................................................................. 6-18
Total ............................................................... 30-31

1 Required courses are MATH 1130, MATH 3070, and a choice of either MATH 1830 or MATH 3080.
2 Students may substitute approved biology and chemistry courses from one of the following four options, each with unique requirements:

Botany Option: (18 hours)
1. BIOL 3240, 4310, 4320, 4330; and
2. Choose two of the four: BIOL 4300, 4310, 4320, 4330, 4780.

Marine Biology Option: (13-17 hours)
1. BIOL 4650; and
2. Choose one of the four: BIOL 4610, 4780, 4810, 4840; and
3. Two courses from the GCRL offerings (requires one summer at the Gulf Coast Research Laboratory; coursework from other marine stations may be substituted with the approval of the advisor.)

Microbiology Option: (18-24 hours)
1. BIOL 4130, 4150, 4750, and
2. CHEM 4610, 4620 and;
3. Choose two courses from: BIOL 4000, 4040, 4120, 4160, 4780, or 4850.
or
1. BIOL 4130, 4150, 4750; and
2. CHEM 4500; and
3. Choose two courses from: BIOL 4000, 4040, 4120, 4160, 4780, or 4850.

Zoology Option: (16-28 hours)
1. BIOL 3040, 3530, 4610 and
2. Choose two courses from: BIOL 3060, 3330, 4000, 4230, 4630, 4810, 4820, or 4830.

CELLULAR AND MOLECULAR BIOLOGY CONCENTRATION (BIBI)

(Leading to the Bachelor of Science Degree)

Freshman Year

- BIOL 1000 Introduction to Biological Methods ............ 1
- BIOL 1050 Principles of Biology ............................... 3
- BIOL 1110 General Zoology ...................................... 4
- BIOL 1120 General Botany ......................................... 4
- ENGL 1010 Writing I ................................................. 4
- ENGL 1020 Writing II .............................................. 4
- CHEM 1110 General Chemistry I ................................. 4
- CHEM 1120 General Chemistry II ............................... 4
- MATH 1 ................................................................. 6
Total ...................................................... 28-29

Sophomore Year

- HIST 2010 American History I ................................... 3
- HIST 2020 American History II .................................. 3
- Humanities/Fine Arts Electives ................................. 6
- ENGL 2130, 2230, or 2330 ....................................... 3
- PC 2500 Communicating in the Professions ................3
- MATH 1 ................................................................. 6
Total ...................................................... 29

Junior Year

- BIOL 3130 General Ecology .................................... 4
- BIOL 3140 Cellular Biology ....................................... 4
- BIOL 3200 General Microbiology ............................... 4
- BIOL 3810 General Genetics .................................... 4
- BIOL 3920 Biological Communication Skills ............... 3
- CHEM 3005 Elementary Organic Chemistry ............... 4
- Social/Behavioral Science Electives ........................... 6
Total ...................................................... 29

Senior Year

- Approved Biology and Chemistry courses* .................. 13-24
- Electives .................................................................. 6-18
Total ............................................................... 30-31

1 Required courses are MATH 1130, MATH 3070, and a choice of either MATH 1830 or MATH 3080.
2 Students may substitute approved biology and chemistry courses from one of the following four options, each with unique requirements:
### Tennessee Technological University

**Senior Year**
- **BIOL 4150 Molecular Genetics** ............... 3
- **BIOL 4160 Genetic Engineering Laboratory** ........ 2
- **BIOL 4320 Plant Physiology** ..................... 3
- **BIOL 4040, 4060, or 4850** ......................... 3
- **CHEM 4610 General Biochemistry** .................. 3
- **CHEM 4620 General Biochemistry** .................. 4
- **CHEM 4650 General Biochemistry Laboratory** ....... 2
- **Social/Behavioral Science Elective** .................. 3
- **Electives** .................................................. 7
- **Total** ..................................................... 29

1 Required courses are MATH 1130, MATH 3070, and a choice of either MATH 1830 or MATH 3080.

**ENVIRONMENTAL BIOLOGY CONCENTRATION (BIEB)**

(Leading to the Bachelor of Science Degree)

**Freshman Year**
- **BIOL 1000 Introduction to Biological Methods** ...... 1
- **BIOL 1050 Principles of Biology** ..................... 3
- **BIOL 1110 General Zoology** ............................ 4
- **BIOL 1120 General Botany** ............................. 4
- **ENGL 1010 Writing I** .................................... 3
- **ENGL 1020 Writing II** .................................... 3
- **CHEM 1110 General Chemistry I** ..................... 4
- **CHEM 1120 General Chemistry II** .................... 4
- **MATH 1130 College Algebra** ............................ 3
- **MATH 1830 Concepts of Calculus** .................... 3
- **Total** ..................................................... 32

**Sophomore Year**
- **GEOL 1040 The Dynamic Earth** ..................... 4
- **GEOL 1045 or 2000** ..................................... 3-4
- **Humanities/Fine Arts Electives** ....................... 6
- **ENGL 2130, 2230, or 2330** ............................ 3
- **HIST 2010 American History I** ....................... 3
- **HIST 2020 American History II** ...................... 3
- **PHYS 2010 Algebra-based Physics I** .................. 4
- **PHYS 2020 Algebra-based Physics II** .................. 4
- **Total** ..................................................... 32

**Junior Year**
- **BIOL 3040, 3060, 4000, 4040** .......................... 6
- **ENGL 3080** ................................................ 3
- **HIST 3010 American History I** ....................... 3
- **HIST 3020 American History II** ...................... 3
- **PHYS 3010 Algebra-based Physics I** .................. 4
- **PHYS 3020 Algebra-based Physics II** .................. 4
- **Total** ..................................................... 29-30

**Senior Year**
- **BIOL 4320 Field Botany** .............................. 3
- **BIOL 4610 or 4840** ..................................... 3
- **BIOL 4630, 4810, 4820, or 4830** ..................... 3
- **AGRN 2210, BIOL 4330, GEOL 4150, or GEOL 4710** . 3-4
- **Social/Behavioral Science Electives** .................. 3
- **Electives** .................................................. 7-9
- **Total** ..................................................... 30

**HEALTH SCIENCES CONCENTRATION (BIHS)**

(Leading to the Bachelor of Science Degree)

**Freshman Year**
- **BIOL 1010 Human Anatomy & Physiology I** ....... 4
- **BIOL 2000 Human Anatomy & Physiology II** ....... 4
- **ENGL 2130, 2230, or 2330** ............................ 3
- **PHYS 2010 Algebra-based Physics I** .................. 4
- **PHYS 2020 Algebra-based Physics II** .................. 4
- **Humanities/Fine Arts Electives** ....................... 6
- **MATH 1** .................................................... 3
- **Total** ..................................................... 28

**Sophomore Year**
- **BIOL 3130 General Ecology** ............................ 4
- **BIOL 3140 Cellular Biology** ............................ 4
- **BIOL 3230 Health Science Microbiology** ............ 4
- **BIOL 3810 General Genetics** ........................... 4
- **BIOL 3920 Biological Communication Skills** ....... 3
- **CHEM 3010 Organic Chemistry I** ...................... 4
- **CHEM 3020 Organic Chemistry II** ..................... 4
- **PC 2500 Communicating in the Professions** ........ 3
- **Total** ..................................................... 30

**Junior Year**
- **BIOL 4150 Molecular Genetics** ...................... 3
- **Biology Directed Electives** ............................. 6-8
- **HIST 2010 American History I** ....................... 3
- **HIST 2020 American History II** ...................... 3
- **PSY 2010 General Psychology** ........................ 3
- **Social/Behavioral Science Elective** ................... 3
- **Electives** .................................................. 7-9
- **Total** ..................................................... 30

1 Required courses are MATH 1130, MATH 3070, and a choice of either MATH 1830 or MATH 3080.

2 Choose two courses from BIOL 3040, 3060, 4000, 4040, 4060, 4750, 4940.
### General Management Option (BUMA)

*(Leading to the Bachelor of Science in Business Administration Degree)*

For courses in the freshman and sophomore years, see Basic Business (page 111).  

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| Freshman | BMGT 3510 Management & Organization Behavior... 3  
BMGT 3600 International Management .................. 3  
BMGT 3630 Human Resource Management ................ 3  
DS 3620 Management Science ............................. 3  
DS 3810 Business Applications of Microcomputers ... 3  
DS 3841 Management Information Systems............. 3  
ECON 3320, 3810, or 3820 ................................. 3  
FMT 3400 Principles of Marketing ..................... 3  
Business elective 1 ........................................ 3 |
| Total    | 30      |

<table>
<thead>
<tr>
<th>Senior</th>
<th>Courses</th>
</tr>
</thead>
</table>
| BMGT 4410 Conflict Management & Negotiation ...... 3  
BMGT 4520 Applied Management Skills ................ 3  
BMGT 4930 Business Strategy ............................ 3  
BMGT 4930 Business Strategy ............................ 3  
DS 3810 Business Applications of Microcomputers ... 3  
DS 3841 Management Information Systems............. 3  
DS 3850 Advanced Business Data Processing .......... 3  
DS 3870 Business Web Applications Development ... 3  
ECON 3610 Business Statistics I ........................ 3  
FMT 3210 Principles of Managerial Finance .......... 3  
ECON 3620 Business Web Applications Development ... 3  |
| Total    | 30      |

1 Elective courses are to be selected in consultation with the academic advisor.

### Human Resource Management Option (BUHR)

*(Leading to the Bachelor of Science in Business Administration Degree)*

For courses in the freshman and sophomore years, see Basic Business (page 111).  

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| Freshman | BMGT 3510 Management & Organization Behavior... 3  
BMGT 3600 International Management .................. 3  
BMGT 3630 Human Resource Management ................ 3  
DS 3620 Management Science ............................. 3  
DS 3810 Business Applications of Microcomputers ... 3  
DS 3841 Management Information Systems............. 3  
ECON 3320, 3810, or 3820 ................................. 3  
LAW 3810 Business Legal Environment and Ethics .... 3  |
| Total    | 30      |

<table>
<thead>
<tr>
<th>Senior</th>
<th>Courses</th>
</tr>
</thead>
</table>
| BMGT 4410 Conflict Management & Negotiation ...... 3  
BMGT 4520 Applied Management Skills ................ 3  
BMGT 4930 Business Strategy ............................ 3  
BMGT 4930 Business Strategy ............................ 3  
DS 3810 Business Applications of Microcomputers ... 3  
DS 3841 Management Information Systems............. 3  
DS 3850 Advanced Business Data Processing .......... 3  
DS 3870 Business Web Applications Development ... 3  
ECON 3610 Business Statistics I ........................ 3  
FMT 3210 Principles of Managerial Finance .......... 3  
ECON 3620 Business Web Applications Development ... 3  |
| Total    | 30      |

1 Elective courses are to be selected in consultation with the academic advisor.

### Management Information Systems Option (BUIN)

*(Leading to the Bachelor of Science in Business Administration Degree)*

For courses in the freshman and sophomore years, see Basic Business (page 111).  

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| Freshman | BMGT 4520 Applied Management Skills ................ 3  
BMGT 4610 Leadership & Employee Development ........ 3  
BMGT 4930 Business Strategy ............................ 3  
DS 3520 Operations Management .......................... 3  
ECON 3320, 3810, or 3820 ................................. 3  
Business elective 1 ........................................ 3  
Non-business electives 1 .................................. 6 |
| Total    | 30      |

1 Elective courses are to be selected in consultation with the academic advisor.

### Production/Operations Management Option (BUPR)

*(Leading to the Bachelor of Science in Business Administration Degree)*

For courses in the freshman and sophomore years, see Basic Business (page 111).  

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
</table>
| Freshman | BMGT 3510 Management & Organization Behavior... 3  
BMGT 3600 International Management .................. 3  
BMGT 3630 Human Resource Management ................ 3  
DS 3620 Management Science ............................. 3  
DS 3810 Business Applications of Microcomputers ... 3  
DS 3841 Management Information Systems............. 3  
ECON 3320, 3810, or 3820 ................................. 3  
LAW 3810 Business Legal Environment and Ethics .... 3  |
| Total    | 30      |

<table>
<thead>
<tr>
<th>Senior</th>
<th>Courses</th>
</tr>
</thead>
</table>
| BMGT 4410 Conflict Management & Negotiation ...... 3  
BMGT 4520 Applied Management Skills ................ 3  
BMGT 4930 Business Strategy ............................ 3  
BMGT 4930 Business Strategy ............................ 3  
DS 3810 Business Applications of Microcomputers ... 3  
DS 3841 Management Information Systems............. 3  
DS 3850 Advanced Business Data Processing .......... 3  
DS 3870 Business Web Applications Development ... 3  
ECON 3610 Business Statistics I ........................ 3  
FMT 3210 Principles of Managerial Finance .......... 3  
ECON 3620 Business Web Applications Development ... 3  |
| Total    | 30      |
**CHEMICAL ENGINEERING (CHE)**

(Leading to the Bachelor of Science in Chemical Engineering Degree)

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>CHE 1010 Introduction to Chemical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>CHE 1510 Computer Applications in Chemical Engineering</td>
<td></td>
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<tr>
<td>ENGR 1210 Introduction to Engineering</td>
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<tr>
<td>ENGR 1120 Programming for Engineers</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 1110 General Chemistry I</td>
<td>4</td>
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<td>CHEM 1120 General Chemistry II</td>
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<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
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<tr>
<td>MATH 1910 Calculus I</td>
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<tr>
<td>MATH 1920 Calculus II</td>
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**Sophomore Year**

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<tbody>
<tr>
<td>CHE 2011 Chemical and Biological Engineering Process Analysis</td>
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<td>CHEM 2110 Calculus III</td>
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<td>MATH 2120 Differential Equations</td>
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<tr>
<td>PHYS 2110 Calculus-based Physics I</td>
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<tr>
<td>PHYS 2120 Calculus-based Physics II</td>
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<td>SPCH 2410 or PC 2500</td>
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<td>Social/Behavioral Science Elective</td>
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**Junior Year**

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<tr>
<td>CHE 3010 Thermodynamics of Chemical Processes</td>
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<td>CHE 3111 Transfer Science I: Conduction, Radiation, and Diffusion.</td>
<td>4</td>
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<tr>
<td>CHE 3021 Separations and Solution</td>
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**Senior Year**

<table>
<thead>
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<tbody>
<tr>
<td>BMGT 4410 Conflict Management &amp; Negotiation</td>
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<tr>
<td>BMGT 4930 Business Strategy</td>
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<tr>
<td>DS or BMGT electives</td>
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<tr>
<td>ECON 3320, 3810, or 3820</td>
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<tr>
<td>LAW 3810 Business Legal Environment and Ethics</td>
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Elective courses are to be selected in consultation with the academic advisor.

**Tennessee Technological University**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHE 3211 Transfer Science II: Fluid Mechanics</td>
<td>4</td>
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<tr>
<td>CHEM 3010 Organic Chemistry I</td>
<td>4</td>
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<td>CHEM 3020 Organic Chemistry II</td>
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<tr>
<td>Social/Behavioral Science Elective</td>
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<tr>
<td>Technical Elective</td>
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<tr>
<td>CEE 2110, ECE 3810, or BIOL 3200</td>
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<td><strong>Total</strong></td>
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**Senior Year (BS/MS Fast Track)**

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CHE 4131 Transfer Science III: Diffusion and Diffusive-Convective Mass Transfer</td>
<td>4</td>
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<td>CHE 4210 Chemical Reaction Engineering</td>
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<tr>
<td>CHE 4240 Chemical Engineering Capstone Laboratory</td>
<td>1</td>
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<td>CHE 4540 Process Dynamics &amp; Control</td>
<td>3</td>
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<tr>
<td>CHE 4410 Process Design I</td>
<td>3</td>
</tr>
<tr>
<td>CHE 4420 Process Design II</td>
<td>3</td>
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<tr>
<td>CHE Technical Electives</td>
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<tr>
<td>CHE 4911 Professionalism and Ethics in Chemical Engineering</td>
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<tr>
<td>CHEM 3510 Physical Chemistry</td>
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<td>CHEM 3520 Physical Chemistry</td>
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**Fifth Year (MS Program)**

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<tr>
<td>DS 3620 Management Science</td>
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<tr>
<td>DS 3841 Management Information Systems</td>
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</tr>
<tr>
<td>ACCT 3210 Cost Accounting</td>
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</tr>
<tr>
<td>ECON 3610 Business Statistics I</td>
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<tr>
<td>FIN 3210 Principles of Managerial Finance</td>
<td>3</td>
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<td>MKT 3400 Principles of Marketing</td>
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<td><strong>Total</strong></td>
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</tbody>
</table>
Tennessee Technological University

2. ENGR 1120 can be any programming language offering.
3. Students must apply to the CHE Fast-Track MS program by the end of their second junior term.
4. Three hours of Technical Electives can be from any of the following courses:
   a. Any College of Engineering course at the 3000 or 4000 level.
   b. Any BIOL/CHEM/MATH/PHYS at the 3000 or 4000 level.
   c. CEE 2100
   d. Any course with the prior approval of the ChE Undergraduate Program Coordinator.
   e. Note that CEE 2100, BIOL 3200, and ECE 3810 cannot count both as a Technical Elective and as part of the CEE 2100/ECE 3810/BIOL 3200 option.
5. Three hours of ChE Technical Electives must come from one of the following courses:
   1. CHE 4330 Polymer Engineering
   2. CHE 4661 Transport in Biochemical and Biological Processes
   3. CHE 4950 MEMS
   4. CHE 4990 Undergraduate Research
6. Students enrolled in the fast-track BS/MS program must complete all requirements for both the BS and MS degrees as outlined in the Undergraduate and Graduate Catalogs, respectively. Students must meet all admission requirements to graduate program.
7. Fast-Track ChE BS/MS students will register for CHE 4911 in which graduate research topics will be discussed.
8. Additional details to complete the BS/MS Fast Track program are shown in the Graduate Catalog and are available in the Department of Chemical Engineering office.

BIO-MOLECULAR ENGINEERING CONCENTRATION (BMOL)

(Leading to the Bachelor of Science in Chemical Engineering Degree)

Freshman Year sem. hrs.

CHE 1010 Introduction to Chemical Engineering 1 ……1
CHE 1510 Computer Applications in Chemical Engineering ………….1
CHEM 1110 General Chemistry I ………….4
CHEM 1120 General Chemistry II ………….4
ENGL 1010 Writing I ………….3
ENGL 1020 Writing II ………….3
Humanities/Fine Arts Elective ………….3
MATH 1910 Calculus I ………….4
MATH 1920 Calculus II ………….4
BIOL 1010 General Biology I ………….4
Total 30

Sophomore Year sem. hrs.

CHE 2110 Chemical and Biological Engineering Process Analysis ………….4
CHE 3730 Chemical Engineering Operations ………….3
ENGL 2130, 2230 or 2330 ………….3
MATH 2110 Calculus III ………….4
MATH 2120 Differential Equations ………….3

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PHYS 2110 Calculus-based Physics I ………….3
PHYS 2120 Calculus-based Physics II ………….3
SPCH 2410 or PC 2500 ………….3
Humanities/Fine Arts Elective ………….3
Social/Behavioral Science Elective ………….3
Total 32

Junior Year2 sem. hrs.

BIOL 3140 Cellular Biology ………….4
BIOL 3200 General Microbiology ………….4
CHE 3010 Thermodynamics of Chemical Processes ………….3
CHE 3111 Transfer Science I: Conduction, Radiation, and Diffusion ………….4
CHE 3021 Separations and Solution Thermodynamics ………….4
CHE 3121 Transfer Science II: Fluid Mechanics ………….4
CHEM 3010 Organic Chemistry I ………….4
CHEM 3020 Organic Chemistry II ………….4
CHEM 3510 Physical Chemistry I ………….4
Total 35

Senior Year sem. hrs.

CHE 4131 Transfer Science III: Diffusion and Diffusive-Convective Mass Transfer ………….4
CHE 4210 Chemical Reaction Engineering ………….4
CHE 4240 Chemical Engineering Capstone Laboratory ………….1
CHE 4410 Process Design I ………….3
CHE 4420 Process Design II ………….3
CHE 4540 Process Dynamics & Control ………….3
CHE 4661 Transport in Biochemical and Biological Processes ………….3
CHE 4910 Professionalism and Ethics in Chemical Engineering ………….1
CHE/BIOL/CHM Technical Elective3 ………….3
CHEM 4610 General Biochemistry ………….3
Social/Behavioral Science Elective ………….3
Total 31

1. Fulfills UNIV 1020 requirement.
2. Students interested in the Che Fast-Track MS program should apply by the end of their second junior term.
3. This Technical Elective can be any of the following courses:
   a. BIOL 3810 General Genetics
   b. BIOL 4040 Immunology
   c. BIOL 4750 Medical Microbiology
   d. BIOL 4750 Pollution Microbiology
   e. BIOL 4850 Medical Microbiology
   f. CHE 4330 Polymer Engineering
   g. CHE 4990 Undergraduate Research

CHEMISTRY (CHEM)

APPLIED CHEMISTRY CONCENTRATION (CHMN)

(Leading to the Bachelor of Science Degree)

A student in any chemistry concentration may attain certification by the American Chemical Society as determined by the Chemistry faculty. The Chemistry Department defines specific areas of certification including, but not restricted to, pure chemistry, biochemistry and environmental chemistry.
The requirements for certification in these areas are outside the curricular requirements of the three major concentrations. To attain ACS-certification within one of the following concentrations, a student must complete the following minimum requirements:

1. The student must take MATH 1920.
2. The student must take CHEM 2010, 3510, 4520, 4610, and 4991. CHEM 3510 and 4520 may be substituted for 3500 and 3420, respectively, in curricula where the lower courses are required.
3. The student must take a minimum of three advanced courses chosen from: CHEM 3520, 4110, 4150, 4210, 4310, 4320, 4410, 4620, 4650, 4710, 4720, BIOL 4160, CEE 3410, GEOL 4711.
4. The advanced courses above must include a minimum of three credit hours of laboratory including either CHEM 4150 or 4650.
5. Requirements for specific areas of certification can be obtained from the Chemistry Advisor.

<table>
<thead>
<tr>
<th>Freshman Year sem. hrs.</th>
<th>Sophomore Year sem. hrs.</th>
<th>Junior Year sem. hrs.</th>
<th>Senior Year sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1110 General Chemistry I ........................................ 4</td>
<td>CHEM 2010 Introduction to Inorganic Chemistry .................... 3</td>
<td>CHEM 3500 Elements of Physical Chemistry ........................ 3</td>
<td>CHEM 4910 Chemistry Seminar ........................................ 2</td>
</tr>
<tr>
<td>CHEM 1120 General Chemistry II ....................................... 4</td>
<td>CHEM 3410 Quantitative Analysis ..................................... 4</td>
<td>CHEM 3010 Organic Chemistry II ....................................... 4</td>
<td>Advanced CHEM Courses ............................................. 9</td>
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<tr>
<td>MATH 1530 Elementary Probability and Statistics .................. 3</td>
<td>CHEM 3420 Analytical Applications .................................. 3</td>
<td>ENGL 2130, 2230, or 2330 ............................................. 3</td>
<td>Humanities/Fine Arts Elective ..................................... 3</td>
</tr>
<tr>
<td>BIOL 1110 General Zoology ................................................ 4</td>
<td>MATH 1910 Calculus I .................................................. 4</td>
<td>CHEM 3010 Organic Chemistry I ....................................... 4</td>
<td>Technical Requirements ............................................. 3-5</td>
</tr>
<tr>
<td>BIOL 1120 General Botany ................................................ 4</td>
<td>PHYS 1920 Calculus II .................................................. 4</td>
<td>CHEM 3020 Organic Chemistry II ..................................... 4</td>
<td>Electives ............................................................. 11-12</td>
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<td>ENGL 1020 Writing I ..................................................... 3</td>
<td>PHYS 2010 Algebra-based Physics I ................................... 4</td>
<td>Junior Year sem. hrs.</td>
<td>Total 30</td>
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<tr>
<td>ENGL 1020 Writing II ..................................................... 3</td>
<td>PHYS 2020 Algebra-based Physics II ................................ 4</td>
<td>Technical Requirements .............................................. 7</td>
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<td>Humanities/Fine Arts Elective ......................................... 3</td>
<td>Social/Behavioral Science Electives ................................ 6</td>
<td>Total 30</td>
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<tr>
<td>CHEM 1500 First-Year Interactions &amp; Advisement..................... 1</td>
<td>Technical Requirements .............................................. 3</td>
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</tr>
<tr>
<td>Total 29</td>
<td>Total 31</td>
<td></td>
<td></td>
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</tbody>
</table>

Students will take chemistry (a) and technical requirements (b) from one of the six options below. Within certain options students should take the indicated social science (c) general education courses to satisfy prerequisites for technical requirements.

**Business Chemistry:**
- a. Nine hours of advanced chemistry approved by the chemistry advisor.
- b. ACCT 3720, BMGT 3510, FIN 3210, MKT 3400 plus 3 hours chosen from DS 3620 or LAW 3810.
- c. ECON 2010 and 2020

**Environmental Chemistry:**
- a. CHEM 4710 and 4720 plus 3 hours of advanced chemistry approved by the chemistry advisor.
- b. BIOL 3130 plus 12 hours chosen from AGRN 3230, AGRN 4220, BIOL 4130, BIOL 4840, GEOL 4100, 4650 and GEOL 4711.

**Forensic Chemistry:**
- a. CHEM 4410 and 4620 plus 3 hours of advanced chemistry approved by the chemistry advisor.
- b. ECON 2010 and 2020

**Health Science Chemistry:**
- a. CHEM 4610 and 4620 plus 3 hours of advanced chemistry approved by the chemistry advisor.
- b. BIOL 2010, BIOL 2020, BIOL 3230 plus 3 hours chosen from BIOL 3810, BIOL 4040, BIOL 4060 and BIOL 4150.

**Industrial Chemistry:**
- a. CHEM 4210, 4520 and 4710.
- b. COOP 2010, COOP 2020, COOP 2030, CSC 1100, MT 1110, PC 3250, plus 3 hours chosen from ACCT 3720, COOP 4010, COOP 4020, COOP 4030 and ENGR 1110.

**Chemistry:**
- a. Nine hours of advanced chemistry approved by the chemistry advisor.
- b. A program of 14 hours of complementary coursework approved by the chemistry advisor.

Pre-professional students majoring in pre-medicine, pre-dentistry, pre-pharmacy, pre-medical technology, pre-cytotechnology, pre-opthalmology and pre-dental hygiene electing to receive a Bachelor of Science Degree with a major in Chemistry from Tennessee Technological University may use the first year of coursework from an accredited professional school as their senior year after completing the first three years of this program as outlined above.

**PURE CONCENTRATION (CHMP)**

*(Leading to the Bachelor of Science Degree)*

<table>
<thead>
<tr>
<th>Freshman Year sem. hrs.</th>
<th>Sophomore Year sem. hrs.</th>
<th>Junior Year sem. hrs.</th>
<th>Senior Year sem. hrs.</th>
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<tbody>
<tr>
<td>CHEM 1110 General Chemistry I ........................................ 4</td>
<td>CHEM 1110 General Chemistry I ........................................ 4</td>
<td>CHEM 1110 General Chemistry I ........................................ 4</td>
<td>CHEM 1110 General Chemistry I ........................................ 4</td>
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<td>CHEM 1120 General Chemistry II ....................................... 4</td>
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<td>ENGL 1020 Writing II ..................................................... 3</td>
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Tennessee Technological University

Social/Behavioral Science Electives ......................... 6
CHEM 1500 First-Year Interactions & Advisement .... 1
Total  29

Sophomore Year

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<th>Course</th>
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<td>MATH 2110 Calculus III</td>
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<td>PHYS 2121 Calculus-based Physics II Laboratory</td>
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Junior Year

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Senior Year

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<td>CHEM 4520 Instrumental Analysis</td>
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<td>CHEM 4610 General Biochemistry</td>
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<td>CHEM 4910 Chemistry Seminar</td>
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<td>CHEM 4991 Introduction to Research</td>
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<td>Total 29</td>
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1 Choose from MATH 2100, 2120, 3070 or PHYS 2920.
2 Choose from CHEM 4210, 4310, 4320, 4410, 4620, 4650, 4710 and 4720.

BIOCHEMISTRY CONCENTRATION (CHMB)

(Leading to the Bachelor of Science Degree)

Freshman Year

<table>
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<tr>
<th>Course</th>
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<td>BIOL 1110 General Zoology</td>
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<td>BIOL 1120 General Botany</td>
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<tr>
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2011-12 Undergraduate Catalog

Sophomore Year

<table>
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<tr>
<th>Course</th>
<th>sem.</th>
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<td>CHEM 3420 Analytical Applications</td>
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<td>BIOL 3140 Cellular Biology</td>
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<td>BIOL 3230 Health Science Microbiology</td>
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<td>PHYS 2010 Algebra-based Physics I</td>
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<td>PHYS 2020 Algebra-based Physics II</td>
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Junior Year

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<td>BIOL 3810 General Genetics</td>
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Senior Year

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<td>CHEM 4650 General Biochemistry Laboratory</td>
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<td>BIOL 4150 Molecular Genetics</td>
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1 Choose from BIOL 4040 or 4060.

CHILD AND FAMILY STUDIES (CFS)

EARLY CHILDHOOD EDUCATION/PRE K-3
EARLY CHILDHOOD SPECIAL EDUCATION/PRE K-3 (ECSE)

(Leading to the Bachelor of Science Degree and the Tennessee Apprentice License)

This program is located in the Department of Curriculum and Instruction.)

Freshman Year

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<tr>
<td>BIOL, CHEM, GEOL, or PHYS 1310</td>
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<td>HEC 1010 Life Span Development</td>
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<td>ENGL 1010 Writing I</td>
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<td>FOED 2011 Introduction to Teaching &amp; Technology</td>
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<td>MATH 1410 Survey of Elementary Mathematics I</td>
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<td>FOED Activity</td>
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<td>HEC 1030 Introduction to Nutrition</td>
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### CIVIL ENGINEERING (CE)

(Leading to the Bachelor of Science in Civil Engineering Degree)

#### Freshman Year

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<td>Conception to Age 9</td>
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<td>CFS 2400, 2410 Children with Special Needs;</td>
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<td>ENGL 2130 American Literature</td>
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<td>GEOG 1120 Human Geography</td>
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<td>EXPW 2430 First Aid, Safety &amp; CPR</td>
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#### Sophomore Year

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<td>ECSP 3001 Curriculum for Infants, Toddlers &amp;</td>
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<td>Preschoolers</td>
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<td>ECSP 3200 Procedures for Infants, Toddlers &amp;</td>
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<td>Preschoolers</td>
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<td>ECSP 3211 Practicum: Procedures for Infants</td>
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<td>Toddlers &amp; Preschoolers</td>
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<td>FOED 3010 Integrating Instruction Technology</td>
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<td>into the Classroom</td>
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<td>MUS 1030 or ART 1030</td>
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<td>ECED 3300 Concepts for Young Children:</td>
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<td>Mathematics, Science &amp; Social Studies</td>
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<td>ECED 3310 Practicum: Concepts for Young</td>
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<td>Children</td>
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<td>FOED 3810 Field Experiences in Education</td>
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<td>MUS 1074 Music to Meet Exceptional Education</td>
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#### Junior Year

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<td>Partnerships</td>
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<td>ECSP 4000 Developmentally Appropriate</td>
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<td>Practices: Birth-PreSchool</td>
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<td>ECSP 4100 Developmentally Appropriate</td>
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<td>Practices: K-4</td>
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<td>ECSP 4300 Assessment of Young Children</td>
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<td>SPCH 2410 or PC 2500</td>
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<td>ECSP 4870 Student Teaching I</td>
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<td>ECSP 4880 Student Teaching II</td>
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<td>CHEM 1110 General Chemistry I</td>
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<td>ENGL 1010 Writing I</td>
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<td>ENGL 1020 Writing II</td>
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#### Senior Year

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<td>CEE 4600, 4610, 4630, 4640, 4650, 4670</td>
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<td>CEE 4130, 4160, 4190 Structural Mechanics</td>
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<td>CEE 4130, 4350, 4360, 4380, 4700 Structural</td>
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<td>CEE 4410, 4420, 4430, 4440, 4450 Environmental</td>
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<td>Engineering</td>
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<td>CEE 4600, 4610, 4630, 4640, 4660</td>
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### 2011-12 Undergraduate Catalog

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<td>MATH 1910 Calculus I</td>
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<tr>
<td>ENGR 1210 Introduction to Engineering</td>
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<td>ENGR 1110 Engineering Graphics</td>
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<tr>
<td>ENGR 1120 Programming for Engineers</td>
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<td>CEE 1020 Connections to Civil and Environmental Engineering</td>
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<td>MATH 2110 Calculus III</td>
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<td>MATH 2120 Differential Equations</td>
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<td>PHYS 2110, 2111 Calculus-based Physics I</td>
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<td>CEE 2110 Statics</td>
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<td>SPCH 2410 or PC 2500</td>
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<td>Social/Behavioral Science Electives</td>
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<td>GEOL 3210 Geology for Engineers</td>
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<td>CEE 3110 Mechanics of Materials</td>
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<td>ME 2330 Dynamics</td>
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<td>ENGL 2130, 2230, or 2330</td>
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<td>CEE 3030 Civil Engineering Materials</td>
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<td>CEE 3320 Structural Mechanics</td>
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<td>CEE 3413 Environmental Engineering</td>
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<td>CEE 3420 Hydraulics</td>
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<td>CEE 3610 Transportation Engineering</td>
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<tr>
<td>CEE 4310 Structural Steel Design</td>
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<td>ISE 3210 (3200)^2</td>
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<td>ME 3720 Fluid Mechanics</td>
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<td>ECE 3810, ME 3210, or ChE 3010</td>
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<td>CEE 4800 Geotechnical Engineering I</td>
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<td>CEE 4920 Professionalism &amp; Ethics</td>
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<td>CEE 4940 Fundamentals of Civil Engineering</td>
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<td>CEE 4950 Senior Design Project</td>
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1. This course not included in 128-hour curriculum.
2. MATH 2100, 3810, 4510, or 4710
3. Approved CEE Electives: CEE 3100, any 4000-level CEE course with prior approval by advisor.
4. Approved CEE Sequences: CEE 4130, 4160, 4190 Structural Mechanics CEE 4130, 4350, 4360, 4380, 4700 Structural Engineering CEE 4410, 4420, 4430, 4440, 4450 Environmental Engineering CEE 4600, 4610, 4630, 4640, 4660 Transportation Engineering
Tennessee Technological University

**COMMUNICATION (COM)**

**NEWS EDITORIAL OPTION (JOUR)**

(Leading to the Bachelor of Science Degree with a concentration in Journalism)

**Freshman Year**

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<td>SPCH 2410 Introduction to Speech Communication</td>
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<td>JOUR 2200 Mass Communication in a Changing Society</td>
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<td>Laboratory Science</td>
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<td>MATH</td>
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<tr>
<td>SOC 1010 Introduction to Sociology</td>
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**Sophomore Year**

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<td>ENGL 2330 World Literature</td>
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<td>HIST 2010 American History I</td>
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<td>HIST 2020 American History II</td>
<td>3</td>
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<tr>
<td>JOUR 2220 News Reporting &amp; Copy Editing</td>
<td>3</td>
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<tr>
<td>JOUR 3350 Newspaper Production &amp; Design</td>
<td>3</td>
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<tr>
<td>SPCH 4430 Interpersonal Communication</td>
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<tr>
<td>JOUR 3400 or 3370</td>
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<tr>
<td>POLS 1000 American Government</td>
<td>3</td>
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<tr>
<td>JOUR 3740 Advertising Copy &amp; Layout</td>
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<td>JOUR 3460 Introduction to Public Relations</td>
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**Junior Year**

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<td>SPCH 3620 Intercultural Communication</td>
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<td>JOUR 3760 History &amp; Law of Journalism</td>
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<td>JOUR 4360 Magazine Production &amp; Design</td>
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<td>JOUR 4820 Advanced Reporting</td>
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<td>POLS 3330 State &amp; Local Government</td>
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**Senior Year**

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<tr>
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<td>JOUR 4830 Feature Writing</td>
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<td>JOUR 4930 Advanced Copy Editing</td>
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<td>PSY 2010 General Psychology</td>
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<tr>
<td>SOC 1650 Social Problems</td>
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</table>
Sports Multi-Media Communications

The Sports Multi-Media Communications option is designed to prepare students for various careers in the area of sports. The curriculum is characterized by an emphasis on sports management and coaching to provide background and experience in sports communication preparing students for a career as a sports/columnist or in sports public relations. Hands-on experience in radio and television may be gained via internship.

Courses in Sports Multi-Media Communications. Students may take four of the following courses. Only one internship may count toward the total of four.

- EXPW 2170 Introduction to Sport Management
- EXPW 3180 Introduction to Coaching
- EXPW 3300 Sports Officiating
- EXPW 4171 Exercise and Sport Psychology
- EXPW 4540 Ethical Issues in Sport
- EXPW 4550 Sport Governance
- JOUR 4853 (5853) Internship
- JOUR 4856 (5856) Internship
- JOUR 4859 (5859) Internship

Writing Fiction and Non-Fiction

The Writing Fiction and Non-Fiction option is designed to extend students' writing experiences beyond the freelance writing course and also prepare them for additional experiences in fiction and non-fiction writing, according to their aspirations.

Courses in Writing Fiction and Non-Fiction. Students take four of the following courses. Only one may include a special problems course.

- ENGL 3400 Introduction to Creative Writing
- ENGL 4430 (5430) Creative Writing: Fiction
- ENGL 4440 (5440) Creative Writing: Essay
- ENGL 4450 (5450) Creative Writing: Poetry
- ENGL 4531 Grammar and Language
- JOUR 4843 (5843) Special Problems
- JOUR 4846 (5846) Special Problems
- JOUR 4949 (5849) Special Problems

Courses in Literature.

Students take four of the following courses:

- ENGL 3500 Mythology
- ENGL 4111 (5111) Chaucer
- ENGL (THEA) 4121 (5121) Shakespeare
- ENGL 4130 (5130) Milton
- ENGL 4140 (5140) Topics in British Literature to 1667
- ENGL 4210 (5210) Eighteenth-Century British Literature
- ENGL 4221 (5221) Romantic Literature
- ENGL 4231 (5231) Victorian Literature

USING FICTIO AND NON-FICTION

The Writing Fiction and Non-Fiction option is designed to extend students' writing experiences beyond the freelance writing course and also prepare them for additional experiences in fiction and non-fiction writing, according to their aspirations.

Courses in Writing Fiction and Non-Fiction. Students take four of the following courses. Only one may include a special problems course.

- ENGL 3400 Introduction to Creative Writing
- ENGL 4430 (5430) Creative Writing: Fiction
- ENGL 4440 (5440) Creative Writing: Essay
- ENGL 4450 (5450) Creative Writing: Poetry
- ENGL 4531 Grammar and Language
- JOUR 4843 (5843) Special Problems
- JOUR 4846 (5846) Special Problems
- JOUR 4949 (5849) Special Problems

Courses in Literature.

Students take four of the following courses:

- ENGL 3500 Mythology
- ENGL 4111 (5111) Chaucer
- ENGL (THEA) 4121 (5121) Shakespeare
- ENGL 4130 (5130) Milton
- ENGL 4140 (5140) Topics in British Literature to 1667
- ENGL 4210 (5210) Eighteenth-Century British Literature
- ENGL 4221 (5221) Romantic Literature
- ENGL 4231 (5231) Victorian Literature

Writing Fiction and Non-Fiction

The Writing Fiction and Non-Fiction option is designed to extend students' writing experiences beyond the freelance writing course and also prepare them for additional experiences in fiction and non-fiction writing, according to their aspirations.

Courses in Writing Fiction and Non-Fiction. Students take four of the following courses. Only one may include a special problems course.

- ENGL 3400 Introduction to Creative Writing
- ENGL 4430 (5430) Creative Writing: Fiction
- ENGL 4440 (5440) Creative Writing: Essay
- ENGL 4450 (5450) Creative Writing: Poetry
- ENGL 4531 Grammar and Language
- JOUR 4843 (5843) Special Problems
- JOUR 4846 (5846) Special Problems
- JOUR 4949 (5849) Special Problems

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- ENGL 4111 (5111) Chaucer
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- ENGL 4130 (5130) Milton
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- ENGL 4450 (5450) Creative Writing: Poetry
- ENGL 4531 Grammar and Language
- JOUR 4843 (5843) Special Problems
- JOUR 4846 (5846) Special Problems
- JOUR 4949 (5849) Special Problems

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- ENGL 4450 (5450) Creative Writing: Poetry
- ENGL 4531 Grammar and Language
- JOUR 4843 (5843) Special Problems
- JOUR 4846 (5846) Special Problems
- JOUR 4949 (5849) Special Problems

Courses in Literature.

Students take four of the following courses:

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- ENGL 4111 (5111) Chaucer
- ENGL (THEA) 4121 (5121) Shakespeare
- ENGL 4130 (5130) Milton
- ENGL 4140 (5140) Topics in British Literature to 1667
- ENGL 4210 (5210) Eighteenth-Century British Literature
- ENGL 4221 (5221) Romantic Literature
- ENGL 4231 (5231) Victorian Literature
Electives ..................................................................... 3

SOC 4430 People in Organizations............................ 3

JOUR 3760 History & Law of Journalism ................... 3

Humanities/Fine Arts Elective ..................................... 3

Behavior .............................................................. 3

BMGT 3510 Management & Organization

Emphasis Area Courses ............................................. 6

BMGT 3510 Management & Organization

Behavior .............................................................. 3

SOC 4430 People in Organizations............................ 3

Elective ..................................................................... 3

Total 30

Senior Year sem. hrs.

Humanities/Fine Arts Elective ..................................... 3

JOUR 4830 Feature Writing ....................................... 3

JOUR 4930 Advanced Copy Editing ......................... 3

Emphasis Area Courses ............................................. 6

PSY 3410 Group Dynamics ........................................ 3

JOUR 4460 Public Relations/Cases &

Practices .................................................................. 3

SOC 1650 Social Problems ........................................ 3

Electives ..................................................................... 6

Total 30

1 This course not included in 120-hour curriculum.
2 Emphasis Area Courses

Agricultural Communications
The Agricultural Communications option is designed to prepare students for various careers in communications in agriculture.

Courses in Agricultural Communications. Students take three of the following agricultural courses and one internship:

AGBE 2100 World Food and Society

AGBE 2100 Economics of Agriculture

AGBE 4120 (5120) Environmental and Natural

Resource Economics

CHEM 3710 Chemistry and the Environment

GEOL 1045 Earth, Environment, Resources, and Society

GEOL 2000 Earth Evolution and Life History

JOUR 4859 (5859) Internship

JOUR 4856 (5856) Internship

JOUR 4859 (5859) Internship

Environmental Communications
The Environmental Communications option is designed to prepare students for various careers in appropriate communication areas and in newspapers, magazines and government to provide background and experience in preparing students for those careers, the curriculum places emphasis on practices and problems.

Courses in Environmental Communications. Students take four of the following courses. Only one internship may count toward the four.

AGBE 2100 World Food and Society

AGBE 4120 (5120) Environmental and Natural

Resource Economics

CHEM 3710 Chemistry and the Environment

GEOL 1045 Earth, Environment, Resources, and Society

GEOL 2000 Earth Evolution and Life History

JOUR 4859 (5859) Internship

JOUR 4856 (5856) Internship

JOUR 4859 (5859) Internship

WFS (BIOL) 3210 General Ecology

Total 30

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Digital Electronic Multi-Media
The Digital Electronic Multi-Media option is designed to prepare students for various careers in the area of electronic publishing. The curriculum is characterized by an emphasis on analytical methods for business problem solving, information technology applications and electronic publishing, preparing students to serve as a web master for a newspaper, magazine or PR department.

Courses in Digital Electronic Multi-Media. Students take four of the following courses:

SPCH 3000 Computer Mediated Communication

SPCH 3120 Visual Communication

WEBD 1500 Introduction to Web Design

WEBD 2300 Web Site Design: Dynamic Sites

Sports Multi-Media Communications
The Sports Multi-Media Communications option is designed to prepare students for various careers in the area of sports. The curriculum is characterized by an emphasis on sports management and coaching to provide background and experience in sports communication preparing students for a career as a sports/columnist or in sports public relations. Hands-on experience in radio and television may be gained via internship.

Courses in Sports Multi-Media Communications. Students may take four of the following courses. Only one internship may count toward the total of four.

EXPW 2170 Introduction to Sport Management

EXPW 3180 Introduction to Coaching

EXPW 3300 Sports Officiating

EXPW 4171 Exercise and Sport Psychology

EXPW 4540 Ethical Issues in Sport

EXPW 4550 Sport Governance

JOUR 4853 (5853) Internship

JOUR 4856 (5856) Internship

JOUR 4859 (5859) Internship

Writing Fiction and Non-Fiction
The Writing Fiction and Non-Fiction option is designed to extend students’ writing experiences beyond the freelance writing course and also prepare them for additional experiences in fiction and non-fiction writing, according to their aspirations.

Courses in Writing Fiction and Non-Fiction. Students take four of the following courses. Only one may include a special problems course.

ENGL 3400 Introduction to Creative Writing

ENGL 4430 (5430) Creative Writing: Fiction

ENGL 4440 (5440) Creative Writing: Essay

ENGL 4450 (5450) Creative Writing: Poetry

ENGL 4531 Grammar and Language

JOUR 4843 (5843) Special Problems

JOUR 4846 (5846) Special Problems

JOUR 4949 (5849) Special Problems

Courses in Literature.
Students take four of the following courses.

ENGL 3500 Mythology

ENGL 4111 (5111) Chaucer

ENGL (THEA) 4121 (5121) Shakespeare

ENGL 4130 (5130) Milton
SPEECH COMMUNICATION CONCENTRATION (SPCM)
(Leading to the Bachelor of Science Degree)

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Course Description</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td></td>
<td>ENGL 1010 Writing I</td>
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<tr>
<td></td>
<td></td>
<td>ENGL 1020 Writing II</td>
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<td></td>
<td></td>
<td>SPCH 2410 Introduction to Speech Communication</td>
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<td>JOUR 2200 Mass Communication in a Changing Society</td>
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<td>Laboratory Science</td>
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<tr>
<td></td>
<td></td>
<td>SOC 1010 Introduction to Sociology</td>
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<td>MATH</td>
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<td>Social/Behavioral Science</td>
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<td></td>
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<td>UNIV 1020 First-Year Connections</td>
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Sophomore Year

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<tr>
<td>HIST 2010 American History I</td>
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<tr>
<td>HIST 2020 American History II</td>
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<tr>
<td>ENGL 2330 World Literature</td>
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<tr>
<td>Humanities/Fine Arts Electives</td>
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<tr>
<td>JOUR 3460 Introduction to Public Relations</td>
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<td>Social/Behavioral Science</td>
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<td>SPCH 2000 Communication Practices in Organizations</td>
<td>3</td>
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<tr>
<td>SPCH 2800 Interviewing</td>
<td>3</td>
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<td>SPCH 3610 Foundations of Speech</td>
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Junior Year

<table>
<thead>
<tr>
<th>Course Description</th>
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<tbody>
<tr>
<td>JOUR 3400 Introduction to Broadcast Journalism</td>
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<tr>
<td>JOUR 3760 History and Law of Journalism</td>
<td>3</td>
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<tr>
<td>SPCH 3000 Computer Mediated Communication</td>
<td>3</td>
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<tr>
<td>SPCH 3120 or LING 4440</td>
<td>3</td>
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<tr>
<td>SPCH 3130 Speech Activities</td>
<td>3</td>
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<tr>
<td>SPCH 3620 Intercultural Communication</td>
<td>3</td>
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<tr>
<td>SPCH 3630 Discussion &amp; Parliamentary Procedure</td>
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**Computer Engineering (CMPE)**
(Leading to the Bachelor of Science in Computer Engineering Degree)

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<th>Year</th>
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<th>Course Description</th>
<th>Hours</th>
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<tr>
<td>Freshman Year</td>
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<td>ENGL 1010 Writing I</td>
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<td>ENGL 1020 Writing II</td>
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<td></td>
<td></td>
<td>MATH 1910 Calculus I</td>
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<td></td>
<td></td>
<td>MATH 1920 Calculus II</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>CHEM 1110 General Chemistry I</td>
<td>4</td>
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<td>PHYS 2110 &amp; 2111 Calculus-based Physics I, Calculus-based Physics I Laboratory</td>
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<tr>
<td></td>
<td></td>
<td>CSC 2100, 2102 Introduction to Problem Solving and Computer Programming, Problem Solving and Computer Programming Lab</td>
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<td>CSC 2110, 2111 Data Structures and Algorithms, Data Structures and Algorithms Lab</td>
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<td></td>
<td></td>
<td>ENGR 1020 Connections to Engineering &amp; Technology</td>
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Sophomore Year

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<th>Course Description</th>
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<tbody>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
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<tr>
<td>MATH 2010 Elementary Matrix Algebra</td>
<td>2</td>
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<td>MATH 2011 Matrix Algebra Computer Lab</td>
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<tr>
<td>MATH 2120 Differential Equations</td>
<td>3</td>
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<tr>
<td>MATH 2110 Calculus III</td>
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<tr>
<td>PHYS 2120, 2121 Calculus-based Physics II, Calculus-based Physics II Laboratory</td>
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</tr>
<tr>
<td>Social/Behavioral Science Elective</td>
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<tr>
<td>CSC 2400 Design of Algorithms</td>
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</tr>
<tr>
<td>ECE 2010 Electric Circuits I</td>
<td>3</td>
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<tr>
<td>ECE 2011 Electrical Engineering Lab</td>
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<tr>
<td>ECE 2020 Electric Circuits II</td>
<td>3</td>
</tr>
<tr>
<td>ECE 2110 Introduction to Digital Systems</td>
<td>3</td>
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<td>Total</td>
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Junior Year

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ECE 3010 Signals &amp; Systems</td>
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<tr>
<td>ECE 3020 Discrete-time Signals and Systems</td>
<td>3</td>
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<tr>
<td>ECE 3060 Electrical Engineering Lab II</td>
<td>1</td>
</tr>
<tr>
<td>ECE 3120 Microcomputer Systems</td>
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</table>
Tennessee Technological University

Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>CSC 2500 Unix Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CSC 2550 Foundations of Information Technology</td>
<td>3</td>
</tr>
<tr>
<td>CSC 2560 Networks for Information Technologists</td>
<td>3</td>
</tr>
<tr>
<td>Humanities/Fine Arts Electives2 (Culture and Civilization course recommended)</td>
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<tr>
<td>PC 2500 (preferred) or SPCH 2410</td>
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<tr>
<td>Lab Science Sequence2</td>
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<tr>
<td>Social/Behavioral Science Electives2</td>
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<td>Electives</td>
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Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>BMGT 3510 Management &amp; Organization Behavior</td>
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</tr>
<tr>
<td>CSC 3030 Practical &amp; Professional Issues in Computer Science</td>
<td>1</td>
</tr>
<tr>
<td>CSC 3100 Web Programming</td>
<td>3</td>
</tr>
<tr>
<td>CSC 3550 Systems Programming</td>
<td>3</td>
</tr>
<tr>
<td>CSC 3560 Information Storage and Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 3841 Management Information Systems</td>
<td>3</td>
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<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3070 Statistical Methods I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3080 Statistical Methods II</td>
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<tr>
<td>PC 3250 Professional Communication I</td>
<td>3</td>
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<td>Total</td>
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Senior Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>DS 4250 Business Data Communications</td>
<td>3</td>
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<tr>
<td>CSC 4300 Database Management Systems</td>
<td>3</td>
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<tr>
<td>CSC 4575 Information Assurance &amp; Security</td>
<td>3</td>
</tr>
<tr>
<td>CSC 4710 Design and Development of Human and Web Interfaces</td>
<td>3</td>
</tr>
<tr>
<td>CSC 4990 CSC Internship</td>
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<tr>
<td>Electives</td>
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<tr>
<td>Total</td>
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</tbody>
</table>

NOTES

1. This course is not included in the 128 hour curriculum.
2. Select from the University approved list.
3. Select from the ECE Department approved list.

COMPUTER SCIENCE (CSC)

INFORMATION TECHNOLOGY CONCENTRATION (CSIT)

(Leading to the Bachelor of Science Degree)

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>CSC 1020 First-Year Connections1</td>
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<tr>
<td>CSC 1610 Discrete Structures for Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CSC 2100 Introduction to Problem Solving and Computer Programming</td>
<td>3</td>
</tr>
<tr>
<td>CSC 2101 Problem Solving/Computer Programming Lab</td>
<td>1</td>
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<tr>
<td>CSC 2110 Data Structures and Algorithms</td>
<td>3</td>
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<tr>
<td>CSC 2111 Data Structures and Algorithms Lab</td>
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<tr>
<td>DS 2810 Computer Applications in Business</td>
<td>3</td>
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<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
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<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
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<tr>
<td>MATH 1910 Calculus I</td>
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<tr>
<td>Humanities/Fine Arts Elective2</td>
<td>3</td>
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<tr>
<td>Social/Behavioral Arts Elective2</td>
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<td>Total</td>
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2011-12 Undergraduate Catalog

SOFTWARE AND SCIENTIFIC APPLICATIONS CONCENTRATION (CSSC)

(Leading to the Bachelor of Science Degree)

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>CSC 1020 First-Year Connections1</td>
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</tr>
<tr>
<td>CSC 1610 Discrete Structures for Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CSC 2100 Introduction to Problem Solving and Computer Programming</td>
<td>3</td>
</tr>
<tr>
<td>CSC 2101 Problem Solving/Computer Programming Lab</td>
<td>1</td>
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<tr>
<td>CSC 2110 Data Structures and Algorithms</td>
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<tr>
<td>CSC 2111 Data Structures and Algorithms Lab</td>
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<td>MATH 1910 Calculus I</td>
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<td>MATH 1920 Calculus II</td>
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<tr>
<td>Humanities/Fine Arts Elective2</td>
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<tr>
<td>ENGL 1010 Writing I</td>
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ENGL 1020 Writing II ................................................. 3
Total 29

Sophomore Year

CSC 2120 Object-Oriented Programming and Design ...................... 3
CSC 2121 Object-Oriented Programming and Design Lab .................... 1
CSC 2400 Design of Algorithms .................................. 3
CSC 2500 Unix Laboratory .................................. 1
CSC 2710 Foundations of Computer Science ......................... 3
SPCH 2410 or PC 2500 ........................................ 3
MATH 2010 Elementary Matrix Algebra ................................. 2
MATH 2011 Matrix Algebra Computer Lab .................................. 1
First Science Sequence 3 ........................................ 8
Humanities/Fine Arts Elective 2 ...................................... 3
Electives ..................................................................... 3
Total 31

Junior Year

CSC 3030 Practical & Professional Issues in Computer Science ........... 1
CSC 3410 Computer Organization & Assembly Language Programming ... 3
CSC Upper Division Elective 4 ...................................... 3
MATH 3470 Introductory Probability & Statistics ........................ 3
HIST 2010 American History I ....................................... 3
HIST 2020 American History II ...................................... 3
Humanities/Fine Arts Elective 2 ...................................... 3
Social/Behavioral Science Elective 2 .................................. 3
Second Science Sequence 3 ........................................ 8
Total 30

Senior Year

CSC 4000 Operating Systems ........................................... 3
CSC 4300 Database Management Systems .................................. 3
CSC 4320 Computer Architecture ..................................... 3
CSC 4610 Software Engineering I ..................................... 3
CSC 4620 Software Engineering II .................................... 3
CSC Upper Division Elective 4 ...................................... 3
CSC Advanced Core 5 ................................................ 3
Social/Behavioral Science Elective 2 .................................. 3
Upper Division Electives .............................................. 5
Electives ..................................................................... 2
Total 31

1 Not required for transfer students with more than 12 hours.
2 See TBR General Education Core Requirements.
3 Take at least one science sequence from BIOL 1110-1120, CHEM 1110-1120, GEOL 1040-1045 or PHYS 2110-2120 and 2111-2121 (laboratories for 2110-2120).
4 Take any additional 3000- or 4000-level CSC course.
5 Select from one of the following: CSC 4010, CSC 4240, CSC 4400, and CSC 4450.

Junior Year

ECON 3810 Intermediate Microeconomics ......................... 3
ECON 3820 Intermediate Macroeconomics ........................... 3
BMGT 3510 Management & Organization Behavior ................... 3
DS 3520 Operations Management ................................ 3
DS 3620 Management Science ....................................... 3
DS 3841 Management Information Systems ......................... 3
ECON 3320 Money & Banking ....................................... 3
ECON 3610 Business Statistics I ..................................... 3
FIN 3210 Principles of Managerial Finance ......................... 3
LAW 3810 Business Legal Environment and Ethics ................. 3
Total 30

Senior Year

ECON 4510 or FIN 4910 ........................................... 3
ECON Electives ..................................................... 12
BMGT 4930 Business Strategy .................................. 3
MKT 3400 Principles of Marketing ................................... 3
Business electives 1 .................................................. 3
Non-business electives 1 ............................................. 5
Total 30

1 Elective courses are to be selected in consultation with the academic advisor.

ELECTRICAL ENGINEERING (EE)

(Leading to the Bachelor of Science in Electrical Engineering Degree)

Freshman Year

ENGL 1010 Writing I ................................................. 3
ENGL 1020 Writing II .............................................. 3
MATH 1910 Calculus I .............................................. 4
MATH 1920 Calculus II ............................................ 4
CHEM 1110 General Chemistry I ................................... 4
CSC 2100, 2102 Introduction to Problem Solving and Computer Programming, Problem Solving and Computer Programming Lab ........................................... 3
PHYS 2110, 2111 Calculus-based Physics I ........................................... 4
Humanities/Fine Arts Elective ...................................... 3
Social/Behavioral Science Elective .................................. 3
ENGR 1020 Connections to Engineering & Technology ......................... 1
Total 33

Sophomore Year

ENGL 2130, 2230, or 2330 ........................................... 3
SPCH 2410 or PC 2500 ........................................... 3
MATH 2010 Elementary Matrix Algebra .................................. 2
MATH 2110 Matrix Algebra Computer Lab ........................... 1
MATH 2120 Differential Equations .................................. 3
MATH 2110 Calculus III ............................................ 4
PHYS 2120, 2121 Calculus-based Physics II ......................... 4
ECE 2010 Electric Circuits I ........................................ 3
Tennessee Technological University

ECE 2011 Electrical Engineering Laboratory I ..........1
ECE 2020 Electric Circuits II ..............................3
ECE 2110 Introduction to Digital Systems ..............3
Social/Behavioral Science Elective ..........................3
Total 33

Junior Year

ECE 3010 Signals & Systems ..................................3
ECE 3020 Discrete-Time Signals and Systems ...........3
ECE 3060 Electrical Engineering Lab II ..................1
ECE 3300 Electronics I .........................................3
ECE 3510 Electromagnetic Fields I .........................3
ECE 3910 Probability & Random Variables in
   Electrical & Computer Engineering ......................3
Junior Electives ..................................................6
ECE Lab Elective, MATH Elective ............................4
Engineering Fund. Elective ...................................3
Total 32

Senior Year

ECE 4910 Professional Issues in Electrical and
   Computer Engineering .....................................1
ECE 4961 Senior Capstone Design I .......................3
ENGL 3810 British Literature I .............................3
ENGL 2330 World Literature ................................3
ENGL 1010 Writing I ............................................3
ENGL 1020 Writing II .........................................3
ENGL 3000 Introduction to English Methods &
   Research ......................................................3
ENGL 3910 American Literature I ..........................3
ENGL 3920 American Literature II ..........................3
ENGL 3910 American Literature II ..........................3
ENGL 4121 Shakespeare ......................................3
ENGL 4640 Modern and Contemporary Drama ...........3
ENGL 4995 Senior Colloquium ..............................3
English Language Studies Course (4511, 4521 or
   4531) ..................................................................3
THEA 3300 Stagecraft ..........................................3
Humanities/Fine Arts Elective ...............................3
Electives............................................................9
Total 27

1 Select two Directed THEA Electives:
   THEA 2150 Oral Interpretation of Literature
   THEA 3000 History of the Theatre
   THEA 3001 Theatre Special Topics
   THEA 4100 Advanced Acting
   THEA 4400 Dramatic Literature
   THEA 4500 Creative Dramatics

LITERATURE CONCENTRATION (LITR)

(Leading to the Bachelor of Arts Degree)

Freshman Year

ENGL 1010 Writing I ............................................3
ENGL 1020 Writing II .........................................3
Social/Behavioral Science Elective ..........................3
Foreign Language ...............................................6
Natural Science .................................................8
Mathematics ....................................................3
THEA 1030 Introduction to Theatre .........................3
UNIV 1020 First-Year Connections ........................1
Total 30

Sophomore Year

ENGL 2330 World Literature ..................................3
ENGL 3810 British Literature I ..............................3
ENGL 3820 British Literature II ............................3
HIST 2010 American History I ..............................3
HIST 2020 American History II ............................3
THEA 2100 Introduction to Acting .........................3
SPCH 2410 or PC 2500 ........................................3
Foreign Language ...............................................6
Total 30
## Professional Communication Concentration (P COM)

(Leading to the Bachelor of Arts Degree)

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1. English majors meet the foreign language requirement by making a C or better in a foreign language course at the 2020 level or higher excluding Country and People and the Global Studies courses. Electives must include at least six credit hours in any upper-division courses in FREN, GERM, or SPAN (all excluding "Country and People"), HIST, PHIL, PSY, SOC, SPCH, or THEA.

2. Approved ENGL courses, one from each block:
   - British I: ENGL 4111, 4130, 4140
   - British II: ENGL 4210, 4221, 4231, 4240, 4250
   - American: ENGL 4310, 4321, 4330, 4340, 4830
   - Culture/Genre: ENGL 4712, 4713, 4720, 4731, 4741, 4751, 4610, 4620, 4630, 4640
   - Language: ENGL 4511, 4521, 4531
   - Writing: ENGL 3400, 4430, 4440, 4411, 4421, 4451
   - World Literature option: ENGL 4720 or 4751 (Culture block) 3
   - FL upper division (one composition and two literature courses; exclude Country/People courses) 9

| Total | 127 |

## 2011-12 Undergraduate Catalog

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<td>ENGL 3810</td>
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<td>PC 3250</td>
<td>Professional Communication I</td>
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<td>Senior Colloquium</td>
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<td>PC 4990</td>
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1. English majors meet the foreign language requirement by making a C or better in a foreign language course at the 2020 level or higher excluding Country and People and the Global Studies courses. Electives must include at least six credit hours in any upper-division courses in FREN, GERM, or SPAN (all excluding "Country and People"), HIST, PHIL, PSY, SOC, SPCH, or THEA.

Students may use their 24 elective hours to pursue the following optional options:

**Corporate Culture**
- BMGT 3510 Management and Organization 3
- BMGT 3630 Human Resource Management 3
- SPCH 4410 Organizational Communication 3
- SPCH 4430 Interpersonal Communication 3
- SPCH 4630 Persuasion 3

**Information Architecture**
- SPCH 3120 Visual Communication/Rhetoric 3
- WEBD 2300 Web Site Design: Dynamic Sites 3
- WEBD (PC) Web Site Construction/Theory 3
- 3500 Rhetoric of Internet Publishing 3

**Scientific and Technical Writing**
- BIOL 3920 Biological Communication Skills 3
- PC 4940 Technical Editing 3
- Natural Science 8
WRITING/LANGUAGE/GENRE CONCENTRATION (WRIT)

(Leading to the Bachelor of Arts Degree)

Freshman Year  sem. hrs.
ENGL 1010 Writing I ..............................................3
ENGL 1020 Writing II ..............................................3
Social/Behavioral Science Elective ..........................3
Foreign Language  ...................................................6
Natural Science ......................................................8
Mathematics ...........................................................3
SPCH 2410 or PC 2500 .............................................3
Humanities/Fine Arts Elective .................................3
UNIV 1020 First-Year Connections ................................1
Total 30

Sophomore Year  sem. hrs.
ENGL 3810 British Literature I ....................................3
ENGL 3820 American Literature I ..............................3
ENGL 3000 Introduction to English Methods & Research...3
ENGL 2330 World Literature ......................................3
HIST 2010 American History I .................................3
Social/Behavioral Science Elective ............................3
Foreign Language  ...................................................6
Electives ...............................................................6
Total 30

Junior Year  sem. hrs.
ENGL 3820 British Literature II ..................................3
ENGL 3920 American Literature II ............................3
ENGL 4121 Shakespeare ...........................................3
HIST 2020 American History II ...............................3
English (approved courses)  ..................................12
Humanities/Fine Arts Elective ....................................3
Electives ...............................................................3
Total 30

Senior Year  sem. hrs.
ENGL 4995 Senior Colloquium .................................3
English (approved courses)  ..................................18
Electives ...............................................................6
Total 27

1 English majors meet the foreign language requirement by making a C or better in a foreign language course at the 2020 level or higher excluding Country and People and Global Studies courses. Electives must include at least six credit hours in any upper-division courses in FREN, GERM, or SPAN (all excluding “Country and People”), HIST, PHIL, PSY, SOC, SPCH, or THEA.

2 Approved ENGL courses must include:
Writing (any four): ENGL 3400, 4430, 4440, 4411, 4421, 4551

One from each block:
British: ENGL 4111, 4130, 4140, 4210, 4221, 4231, 4240, 4250
American: ENGL 4310, 4321, 4330, 4340, 4830

EXERCISE SCIENCE, PHYSICAL EDUCATION AND WELLNESS (EXPW)

Licensure Concentration (L)

(Leading to the Bachelor of Science Degree in Education and the Apprentice License, with endorsement, Grades K-12)

Freshman Year  sem. hrs.
BIOL1010 Introduction to Biology I ..........................4
BIOL 1020 Introduction to Biology II ........................4
ENGL 1010 Writing I ..............................................3
ENGL 1020 Writing II ..............................................3
EXPW 1021 Connection to Exercise Science ..........1
EXPW 1022 Introduction to Exercise Science ...........2
EXPW 2130 Concepts of Comprehensive Health ......3
EXPW 2160 Drug Use and Abuse ...........................2
FOED 2011 Introduction to Teaching & Technology ...2
MATH .................................................................3
PSY 2010 General Psychology ................................3
Total 30

Sophomore Year  sem. hrs.
BIOL 2350 Introductory Anatomy & Physiology ..........4
EDPY 2200 Educational Psychology ........................3
ENGL 2130, 2230, or 2330 ...................................3
HIST 2015 Human Sexuality ..................................3
HIST 2010 American History I ...............................3
HIST 2020 American History II ............................3
Humanities/Fine Arts Electives .........................6
PC 2500 or SPCH 2410 .........................................3
Social/Behavioral Science Elective .....................3
Total 31

Junior Year  sem. hrs.
EXPW 2430 First Aid, Safety and CPR .................2
EXPW 3010 Dance, Gymnastics & Movement Concepts.................................2
EXPW 3132 School Health Pedagogy and Practicum ........................................2
EXPW 3170 Motor Learning ..................................3
EXPW 3410 Motor Development ..........................3
EXPW 3720 Instructional Strategies .....................3
EXPW 4032 Training for Performance ..................3
EXPW 4420 Kinesiology ......................................3
EXPW 4440 Physiology of Exercise ....................3
EXPW 4711 Analysis and Development of Sport Skills ...........4

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Tennessee Technological University

EXPW 4721 Methods of Elementary Movement ..........4
FOED 3010 Integrating Instructional Technology into the Classroom .............................................3
Total .................................................................. 7

Senior Year

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ATHLETIC TRAINING CONCENTRATION (AT)

(Leading to the Bachelor of Science Degree)

Freshman Year

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<td>EXPW 2130 Concepts of Comprehensive Health</td>
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<td>MATH 1530 Elementary Probability &amp; Statistics</td>
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Sophomore Year

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<td>EXPW 3031 Methods of Conditioning</td>
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<td>EXPW 3002 Therapeutic Rehabilitation &amp; Modalities II</td>
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2011-12 Undergraduate Catalog

Senior Year

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<td>EXPW 4530 Organization &amp; Administration of Interschool Athletics</td>
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<td>EXPW 4750 Advanced Athletic Training</td>
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1 Select as a social/behavioral science elective from the following list: ANTH 1100, ECON 2010, ECON 2020, GEOG 1120, POLS 1000, or SOC 1010.

2 Select as a humanities/fine arts elective from the following list: PHIL 1030, HIST 1110, HIST 1120, THEA 1030, MUS 1030, ART 1030, ENGL 2230, or ENGL 2330.

COACHING AND SPORT ADMINISTRATION CONCENTRATION (CSA)

(Leading to the Bachelor of Science Degree)

Freshman Year

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Sophomore Year

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<td>Humanities/Fine Arts Elective</td>
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<td>EXPW 2001 Orthopedic Assessment I</td>
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<td>EXPW 2010 Clinical I</td>
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<td>EXPW 2020 Clinical II</td>
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Junior Year

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<tr>
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<tbody>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
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<td>EXPW 2160 Drug Use and Abuse</td>
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<tr>
<td>EXPW 2170 Introduction to Sport Administration</td>
<td>3</td>
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<tr>
<td>EXPW 3091 Coaching Individual Sports</td>
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<td>EXPW 3092 Coaching Team Sports</td>
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<td>EXPW 3160 Introduction to Coaching</td>
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<tr>
<td>HEC 1030 Introduction to Nutrition</td>
<td>2</td>
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<td>HIST 2010 American History I</td>
<td>3</td>
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<td>HIST 2020 American History II</td>
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<td>Social/Behavioral Science Elective</td>
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Junior Year

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<tbody>
<tr>
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<td>EXPW 2430 First Aid, Safety and CPR</td>
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<tr>
<td>EXPW 3170 Motor Learning or Guided Elective</td>
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<td>EXPW 3410 Motor Development or Guided Elective</td>
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<td>EXPW 4440 Physiology of Exercise</td>
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<tr>
<td>EXPW 4530 Organization and Administration of Interschool Athletics</td>
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Tennessee Technological University

2011-12 Undergraduate Catalog

Sophomore Year

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>BIOL 2350 Introduction to Anatomy &amp; Physiology</td>
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<tr>
<td>ENGL 2130 American Literature</td>
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<tr>
<td>ENPW 2150 Human Sexuality</td>
<td>3</td>
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<tr>
<td>ENPW 2160 Drug Use and Abuse</td>
<td>2</td>
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<td>HIST 2010 American History</td>
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<td>HIST 2020 American History</td>
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<td>SPCH 2410 or PC 2500</td>
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Junior Year

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<th>Course</th>
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<tbody>
<tr>
<td>EXPW 2430 First Aid, Safety &amp; CPR</td>
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<tr>
<td>EXPW 3032 Exercise Prescription &amp; Wellness</td>
<td>3</td>
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<tr>
<td>EXPW 3170 Motor Learning</td>
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<td>EXPW 3410 Lifespan Motor Development</td>
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<td>EXPW 4420 Kinesiology</td>
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<td>EXPW 4440 Physiology of Exercise</td>
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Senior Year

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<tbody>
<tr>
<td>BMGT 3510 Management of Organizational Behavior</td>
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<td>EXPW 4032 Training for Performance</td>
<td>3</td>
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<tr>
<td>EXPW 4042 Health Promotion</td>
<td>3</td>
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<tr>
<td>EXPW 4171 Exercise &amp; Sport Psychology</td>
<td>3</td>
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<tr>
<td>EXPW 4210 Gerontology</td>
<td>3</td>
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<tr>
<td>EXPW 4520 Adapted Physical Activity and Sport</td>
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<tr>
<td>EXPW 4730 Assessment &amp; Evaluation in PE</td>
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<td>EXPW 4810 Field Experience</td>
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FITNESS AND WELLNESS CONCENTRATION (FW)

(Leading to the Bachelor of Science Degree)

Freshman Year

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<th>Course</th>
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<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
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<td>ENGL 1020 Writing II</td>
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<td>BIOL 1010 Introduction to Biology I</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 1020 Introduction to Biology II</td>
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<tr>
<td>EXPW 1021 Connection to Exercise Science</td>
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<tr>
<td>EXPW 1022 Introduction to Exercise Science</td>
<td>2</td>
</tr>
<tr>
<td>EXPW 1150 Care &amp; Prevention of Athletic Injuries</td>
<td>3</td>
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<tr>
<td>Humanities/Fine Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>HEC 1030 Introduction to Nutrition</td>
<td>2</td>
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<tr>
<td>PSY 2010 General Psychology</td>
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<tr>
<td>MATH 1530 Elementary Probability &amp; Statistics</td>
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Senior Year

<table>
<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>BMGT 4900 Sports Management/Special Topics</td>
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<td>EXPW 3031 Methods of Conditioning</td>
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<tr>
<td>EXPW 3300 Sports Officiating</td>
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<tr>
<td>EXPW 3301 Sports Officiating: Spring Sports</td>
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<tr>
<td>EXPW 4171 Exercise &amp; Sport Psychology</td>
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<tr>
<td>EXPW 4220 Kinesiology or Guided Elective</td>
<td>3</td>
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<tr>
<td>EXPW 4520 Adapted Physical Activity and Sport or Guided Elective</td>
<td>3</td>
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<tr>
<td>EXPW 4540 Ethical Issues in Sport</td>
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<tr>
<td>EXPW 4560 Facility Planning &amp; Management</td>
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<tr>
<td>EXPW 4811 Sport Administration Internship</td>
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<td>EXPW Coaching Electives</td>
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Electives

<table>
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<tbody>
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<tr>
<td>EXPW 4060 Coaching Golf</td>
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<tr>
<td>EXPW 4061 Coaching Football</td>
<td>3</td>
</tr>
<tr>
<td>EXPW 4062 Coaching Basketball</td>
<td>3</td>
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<tr>
<td>EXPW 4064 Coaching Volleyball</td>
<td>3</td>
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<tr>
<td>EXPW 4070 Coaching Soccer</td>
<td>3</td>
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<tr>
<td>EXPW 4080 Coaching Track and Field</td>
<td>3</td>
</tr>
<tr>
<td>EXPW 4090 Coaching Softball</td>
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PRE-OCCUPATIONAL THERAPY CONCENTRATION (OT)

(Leading to the Bachelor of Science Degree)

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
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<tr>
<td>ENGL 1020 Writing II</td>
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<tr>
<td>MATH 1530 Elementary Probability &amp; Statistics</td>
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<tr>
<td>MATH 1710 Pre-calculus I</td>
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<tr>
<td>EXPW 1021 Connection to Exercise Science</td>
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<tr>
<td>EXPW 4021 Introduction to Exercise Science</td>
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<td>EXPW 4060 Coaching Golf</td>
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<tr>
<td>EXPW 4061 Coaching Football</td>
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<td>EXPW 4062 Coaching Basketball</td>
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<td>EXPW 4064 Coaching Volleyball</td>
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<tr>
<td>EXPW 4070 Coaching Soccer</td>
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<tr>
<td>EXPW 4080 Coaching Track and Field</td>
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<td>EXPW 4090 Coaching Softball</td>
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Tennessee Technological University

### 2011-12 Undergraduate Catalog

**Sophomore Year**  

<table>
<thead>
<tr>
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<td>BIOL 2010 Human Anatomy &amp; Physiology I</td>
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<td>BIOL 2020 Human Anatomy &amp; Physiology II</td>
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<tr>
<td>ENGL 2130, 2230, or 2330</td>
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<td>HEC 1030 Introduction to Nutrition</td>
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<tr>
<td>HIST 2010 American History I</td>
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<tr>
<td>HIST 2020 American History II</td>
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<td>3</td>
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<tr>
<td>Humanities/Fine Arts Elective</td>
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<tr>
<td>PSY 2010 General Psychology</td>
<td></td>
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<td>SPCH 2410 or PC 2500</td>
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**Junior Year**  

<table>
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<tbody>
<tr>
<td>EXPW 2130 Concepts of Comprehensive Health</td>
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<tr>
<td>EXPW 2430 First Aid, Safety &amp; CPR</td>
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<tr>
<td>EXPW 3410 Motor Development</td>
<td></td>
<td>3</td>
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<tr>
<td>EXPW 3070 Lifetime Wellness &amp; Leisure Activities</td>
<td></td>
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</tr>
<tr>
<td>EXPW 3170 Motor Learning</td>
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<td>3</td>
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<tr>
<td>EXPW 4171 Exercise &amp; Sports Psychology</td>
<td></td>
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</tr>
<tr>
<td>SPED 3031 Physical Management and Support Services for Orthopedic, Motor and Health Impaired</td>
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<td>3</td>
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<tr>
<td>Humanities/Fine Arts Elective</td>
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**Senior Year**  

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<tr>
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<tbody>
<tr>
<td>EXPW 4210 Gerontology</td>
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<tr>
<td>EXPW 4420 Kinesiology</td>
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<tr>
<td>EXPW 4440 Physiology of Exercise</td>
<td></td>
<td>3</td>
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<tr>
<td>EXPW 4520 Adapted Physical Activity and Sport</td>
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<td>3</td>
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<tr>
<td>EXPW 4730 Assessment &amp; Evaluation in Physical Education</td>
<td></td>
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<td>EXPW 4810 Field Experience</td>
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**Directed Electives**  

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<tr>
<td>BIOL 3140 Cellular Biology</td>
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<td>CHEM 1110 General Chemistry I</td>
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<td>CHEM 1120 General Chemistry II</td>
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<td>PHYS 2010 Algebra-based Physics I</td>
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<td>PHYS 2020 Algebra-based Physics II</td>
<td>4</td>
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<tr>
<td>PSY 3200 Developmental Psychology</td>
<td>3</td>
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<tr>
<td>PSY 4160 Abnormal Psychology</td>
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<tr>
<td>Medical Terminology</td>
<td>1-3</td>
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**Pre-Physical Therapy Concentration (PT)**  

(Leading to the Bachelor of Science Degree)

**Freshman Year**  

<table>
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<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
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<tr>
<td>ENGL 1020 Writing II</td>
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<tr>
<td>EXPW 1021 Connection to Exercise Science</td>
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<tr>
<td>EXPW 1022 Introduction to Exercise Science</td>
<td></td>
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<tr>
<td>EXPW 1150 Care &amp; Prevention of Athletic Injuries</td>
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**Select a humanities/fine arts elective.**

<table>
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<tr>
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<td>BIOL 3140 Cellular Biology</td>
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<td>CHEM 1110 General Chemistry I</td>
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<td>CHEM 1120 General Chemistry II</td>
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<tr>
<td>EXPW 3000 Rehabilitation and Therapeutic Modalities</td>
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<tr>
<td>PHYS 2010 Algebra-based Physics I</td>
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<tr>
<td>PHYS 2020 Algebra-based Physics II</td>
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<tr>
<td>PSY 3200 Developmental Psychology</td>
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<td>PSY 4160 Abnormal Psychology</td>
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<tr>
<td>Medical Terminology</td>
<td>1-3</td>
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</table>
Tennessee Technological University

FINANCE (FIN)

(Leading to the Bachelor of Science in Business Administration Degree)

For courses in the freshman and sophomore years, see Basic Business (page 111).

Junior Year

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>FIN 3220 Intermediate Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 3830 Fundamentals of Investment</td>
<td>3</td>
</tr>
<tr>
<td>BMGT 3510 Management &amp; Organization Behavior</td>
<td>3</td>
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<tr>
<td>DS 3520 Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>DS 3620 Management Science</td>
<td>3</td>
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<td>DS 3841 Management Information Systems</td>
<td>3</td>
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<tr>
<td>ECON 3320, 3810, or 3820</td>
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<tr>
<td>ECON 3610 Business Statistics I</td>
<td>3</td>
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<tr>
<td>FIN 3210 Principles of Managerial Finance</td>
<td>3</td>
</tr>
<tr>
<td>LAW 3810 Business Legal Environment and Ethics</td>
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Total 30

Senior Year

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>FIN 4230 Advanced Financial Decision Analysis</td>
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<tr>
<td>FIN 4910 or ECON 4510</td>
<td>3</td>
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<td>BMGT 4930 Business Strategy</td>
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<td>MKT 3400 Principles of Marketing</td>
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<td>Non-business electives 1</td>
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Total 30

1 Elective courses are to be selected in consultation with the academic advisor.

FOREIGN LANGUAGES (FL)

FRENCH, Option 1 (FLFR)

(Leading to the Bachelor of Arts Degree)

A major will consist of a minimum of 30 semester hours in French, including at least 24 semester hours of Upper Division courses. Students who because of superior previous training begin their major courses at the Upper Division level, may substitute up to six semester hours in a second language or related field toward fulfillment of the major requirement. Linguistics 4500 Introduction to Language Description and Analysis is recommended for all foreign language majors and may, with approval of the departmental chairperson, be substituted for one Upper Division Course in French for students concentrating in French. It is particularly recommended for those French majors who are also working toward teacher licensure at the secondary school level.

The following courses, which require no foreign language background, may not be used as credit substitutes for required Upper Division Foreign Language courses: French 3510; German 3510, 3520, or 4510; Spanish 3510 or 3550. They may, however, serve as open electives in any curriculum or as credit substitutes for certain lower division Foreign Language courses.

2011-12 Undergraduate Catalog

Freshman Year

<table>
<thead>
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<th>Course</th>
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<tbody>
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<td>FREN 2010 Transition to Intermediate French</td>
<td>3</td>
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<tr>
<td>FREN 2020 Intermediate French</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1010 Survey of European Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1020 Survey of European Civilization II</td>
<td>3</td>
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<tr>
<td>MATH</td>
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<tr>
<td>Science</td>
<td>8</td>
</tr>
<tr>
<td>Humanities/Fine Arts Elective 1</td>
<td>3</td>
</tr>
<tr>
<td>UNIV 1020 First-Year Connections 1</td>
<td>1</td>
</tr>
</tbody>
</table>

Total 33

Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 3010 Written Communication in French</td>
<td>3</td>
</tr>
<tr>
<td>FREN 3020 Oral Communication in French 1</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>Any two from: ENGL 2130, 2230, or 2330</td>
<td>6</td>
</tr>
<tr>
<td>SPCH 2410 Introduction to Speech Communication</td>
<td>3</td>
</tr>
<tr>
<td>Social/Behavioral Science Electives</td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Total 30

Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 3110 Survey of French Literature I</td>
<td>3</td>
</tr>
<tr>
<td>FREN 3112 Culture and Civilization of France</td>
<td>3</td>
</tr>
<tr>
<td>FREN 3120 Survey of French Literature II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 4550 and any one of the following:</td>
<td>3</td>
</tr>
<tr>
<td>HIST 4530, 4540, 4560, or 4570 or two course</td>
<td>6</td>
</tr>
<tr>
<td>lower level sequence in another foreign language</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>16</td>
</tr>
</tbody>
</table>

Total 31

Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREN 3100 French Phonetics</td>
<td>3</td>
</tr>
<tr>
<td>Select FREN 3200, 4810, or 4910</td>
<td>3</td>
</tr>
<tr>
<td>FREN 4920 Senior Capstone</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>18</td>
</tr>
</tbody>
</table>

Total 27

* Students are strongly encouraged to take six hours of study abroad courses.
1 This course not included in 120-hour curriculum.
2 ART 1030, GERM 2520, MUS 1030, SPAN 2510, SPAN 2550, THEA 1030, or PHIL 1030
3 This course is not open to students with native or near native fluency in French. Majors with native or near native fluency will substitute a different upper-level course for this one.

FRENCH, Option 2 (FLFR)

This option is only for students who concurrently earn a B.S. degree in engineering, industrial technology, computer science, mathematics, or the physical or biological sciences.
Tennessee Technological University

2011-12 Undergraduate Catalog

Linguistics 4500 Introduction to Language Description and Analysis is recommended for all foreign language majors and may, with approval of the departmental chairperson, be substituted for one Upper Division Course in German for students concentrating in German. It is particularly recommended for those German majors who are also working toward teacher licensure at the secondary school level.

The following courses, which require no foreign language background, may not be used as credit substitutes for required Upper Division Foreign Language courses: French 3510; German 3520 or 4510; Spanish 3510 or 3550. They may, however, serve as open electives in any curriculum or as credit substitutes for certain lower division Foreign Language courses.

Freshman Year

**GERMAN, Option 1 (FLGE)**

A major will consist of a minimum of 30 semester hours in German, including at least 24 semester hours of Upper Division courses. Students who because of superior previous training begin their major courses at the Upper Division level may substitute up to six semester hours in a second language or related field toward fulfillment of the major requirement.

**Sophomore Year**

**Junior Year**

**Senior Year**

* Students are strongly encouraged to take at least six hours in a study-abroad program.

**GERMAN, Option 1 (FLGE)**

(Leading to the Bachelor of Arts Degree)

A major will consist of a minimum of 30 semester hours in German, including at least 24 semester hours of Upper Division courses. Students who because of superior previous training begin their major courses at the Upper Division level may substitute up to six semester hours in a second language or related field toward fulfillment of the major requirement.

* Students are strongly encouraged to take at least six hours in a study-abroad program.

1 This course not included in 120-hour curriculum.
**Tennessee Technological University**

**German, Option 2 (FLGE)**

This option is only for students who concurrently earn a B.S. degree in engineering, industrial technology, computer science, mathematics, or the physical or biological sciences.

### Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem.</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GERM 2010 Transition to Intermediate German</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GERM 2020 Intermediate German</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 1010 Survey of European Civilization I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 1020 Survey of European Civilization II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>MATH</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>UNIV 1020 First-Year Connections</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>29</td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem.</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GERM 3010 Written Communication in German</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GERM 3020 Oral Communication in German</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Any two from: ENGL 2130, 2230, or 2330</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>SPCH 2410 Introduction to Speech Communication</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Social Science</td>
<td></td>
<td>6</td>
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<tr>
<td>Electives</td>
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<td>6</td>
</tr>
<tr>
<td>Total</td>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem.</th>
<th>hrs.</th>
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</thead>
<tbody>
<tr>
<td>GERM 3150 Introduction to German Literature</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GERM 3520 Germany: The Country &amp; the People</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Select one from GERM 3200, 4810, or 4910</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>21</td>
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<tr>
<td>Total</td>
<td></td>
<td>30</td>
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</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem.</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select two from GERM 3200, 4810, or 4910</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>GERM 4920 Senior Capstone</td>
<td></td>
<td>3</td>
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<tr>
<td>Electives</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>31</td>
</tr>
</tbody>
</table>

* Students are strongly encouraged to take at least six hours in a study-abroad program.

1 This course not included in 120-hour curriculum.

2 For the humanities requirement in this option, students must take one English literature course and may use HIST 1010-1020 for six hours of humanities credit, or they may take two English literature courses and one from the following:

1 ART 1030, FREN 2510, MUS 1030, SPAN 2510, SPAN 2550, THEA 1030, or PHIL 1030.

---

**Spanish, Option 1 (FLSP)**

(Leading to the Bachelor of Arts Degree)

A major will consist of a minimum of 30 semester hours in Spanish, including at least 24 semester hours of Upper Division courses. Students who because of superior previous training begin their major courses at the Upper Division level may substitute upper two semester hours in a second language or related field toward fulfillment of the major requirement. Linguistics 4500 Introduction to Language Description and Analysis is recommended for all foreign language majors and may, with approval of the departmental chairperson, be substituted for one Upper Division Course in Spanish for students concentrating in Spanish. It is particularly recommended for those Spanish majors who are also working toward teacher licensure at the secondary school level.

The following courses, which require no foreign language background, may not be used as credit substitutes for required Upper Division Foreign Language courses; French 3510; German 3520 or 4510; Spanish 3510 or 3550. They may, however, serve as open electives in any curriculum or as credit substitutes for certain lower division Foreign Language courses.

### Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem.</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 2010 Transition to Intermediate Spanish</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>SPAN 2020 Intermediate Spanish</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 1010 Survey of European Civilization I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 1020 Survey of European Civilization II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>MATH</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Humanities/Fine Arts Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>UNIV 1020 First-Year Connections</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>32</td>
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</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem.</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 3010 Written Communication in Spanish</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>SPAN 3020 Oral Communication in Spanish</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Any two from: ENGL 2130, 2230, or 2330</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>SPCH 2410 Introduction to Speech Communication</td>
<td></td>
<td>3</td>
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<tr>
<td>Social Science</td>
<td></td>
<td>6</td>
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<tr>
<td>Electives</td>
<td></td>
<td>6</td>
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<tr>
<td>Total</td>
<td></td>
<td>30</td>
</tr>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem.</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 3200, 3030, 4810, 4910 or 4010, 4020, 4110, 4120 (if not already taken)</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>SPAN 4010 or 4020</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>SPAN 4110 or 4120</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 3710, 4790, or two course lower level sequence in another foreign language taught in the foreign language</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
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<td>33</td>
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</tbody>
</table>
**Tennessee Technological University**

### Senior Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any course not already taken from the following: SPAN 3200, 4010, 4020, 4030, 4110, 4120, 4810, or 4910</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 4920 Senior Capstone</td>
<td>3</td>
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<tr>
<td>Electives</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25</strong></td>
</tr>
</tbody>
</table>

* Students are strongly encouraged to take at least six hours in a study-abroad program.
1 This course not included in 120-hour curriculum.
2 ART 1030, FREN 2510, GERM 2520, MUS 1030, THEA 1030, or PHIL 1030.
3 This course is not open to students with native or near native fluency in Spanish. Majors with native or near native fluency will substitute a different upper level course for this one.

### SPANISH, Option 2 (FLSP)

This option is only for students who concurrently earn a B.S. degree in engineering, industrial technology, computer science, mathematics, or the physical or biological sciences.

#### Freshman Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 2010 Transition to Intermediate Spanish</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 2020 Intermediate Spanish</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1010 Survey of European Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 1020 Survey of European Civilization II</td>
<td>3</td>
</tr>
<tr>
<td>MATH</td>
<td>3</td>
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<tr>
<td>Science</td>
<td>3</td>
</tr>
<tr>
<td>UNIV 1020 First-Year Connections</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29</strong></td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 3010 Written Communication in Spanish</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 3020 Oral Communication in Spanish</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>Any two from: ENGL 2130, 2230, or 2330</td>
<td>6</td>
</tr>
<tr>
<td>SPCH 2410 Introduction to Speech Communication</td>
<td>3</td>
</tr>
<tr>
<td>Social Science</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN 3200, 3210, 4030, 4810, or 4910</td>
<td>6</td>
</tr>
<tr>
<td>Either SPAN 4010 or SPAN 4020; Either 4110 or 4120</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any course not already taken from the following SPAN 3200, 3210, 4010, 4020, 4110 or 4120</td>
<td>3</td>
</tr>
<tr>
<td>SPAN 4920 Senior Capstone</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

* Students are strongly encouraged to take at least six hours in a study-abroad program.
1 This course not included in 120-hour curriculum.
2 For the humanities requirement in this option, students must take one English literature course and may use HIST 1010-1020 for six hours of humanities credit, or they may take two English literature courses and one from the following: ART 1030, FREN 2510, GERM 2520, MUS 1030, THEA 1030, or PHIL 1030.
3 This course is not open to students with native or near native fluency in Spanish. Majors with native or near native fluency will substitute a different upper level course for this one.

### GEOSCIENCES (GEOS)

#### ENVIRONMENTAL GEOLOGY CONCENTRATION (EGEO)

(Leading to the Bachelor of Science Degree)

#### Freshman Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 1020 Field Experiences in the Geosciences</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 1040 The Dynamic Earth</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 1045 Earth Environment, Resources &amp; Society</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1110 General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1120 General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
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<td>HIST 2020 American History II</td>
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<td>MATH</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>32-34</strong></td>
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</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 2500 Geologic Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>Required course from Environmental Geology</td>
<td>3-4</td>
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<tr>
<td>PHYS 2010, 2020 or BIOL 1020, 3130</td>
<td>8</td>
</tr>
<tr>
<td>MATH 3070 Statistical Methods I</td>
<td>3</td>
</tr>
<tr>
<td>Humanities/Fine Arts Electives</td>
<td>6</td>
</tr>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 4510 Theory of GIS, I</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29-30</strong></td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social/Behavioral Science Electives</td>
<td>6</td>
</tr>
<tr>
<td>SPCH 2410 Introduction to Speech Communication</td>
<td>3</td>
</tr>
<tr>
<td>Required courses from E GEO Concentration</td>
<td>13-15</td>
</tr>
<tr>
<td>Directed electives from E GEO Concentration</td>
<td>6</td>
</tr>
<tr>
<td>MATH or free elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31-33</strong></td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Course Name</th>
<th>hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 4930 Senior Thesis</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 4931 Senior Thesis</td>
<td>3</td>
</tr>
<tr>
<td>Required course from E GEO Concentration</td>
<td>3-4</td>
</tr>
<tr>
<td>Directed electives from E GEO Concentration</td>
<td>3</td>
</tr>
<tr>
<td>Free Electives</td>
<td>13-17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25-30</strong></td>
</tr>
</tbody>
</table>
1. This course not included in 120-hour curriculum.
2. MATH 1130, 1730, or 1910
3. If MATH 1130 was taken then take MATH 1720; otherwise take a free elective.

**Required Environmental Geology Concentration Courses (21 hours)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>GEOL 3200 Water Resources</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 4100 Environmental Sedimentology</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 4150 Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 4410 Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 4650 Environmental Applications of GIS</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 4711 Hydrogeology</td>
<td>4</td>
</tr>
</tbody>
</table>

**Environmental Concentration Directed Electives, any three of the following nine courses, (9 hours)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>GEOG 1010 Weather and Climate</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 2000 Earth Evolution and Life History</td>
<td>3</td>
</tr>
<tr>
<td>AGRN 2210 Soils</td>
<td>3</td>
</tr>
<tr>
<td>AGET 3510 Agricultural Surveying</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 3710 Chemistry and the Environment</td>
<td>3</td>
</tr>
<tr>
<td>AGRN 4230 Soil Classification</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4240 Systematic Botany</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 4740 Pollution Microbiology</td>
<td>3</td>
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<tr>
<td>WFS 4500 National Wildlife Policy</td>
<td>3</td>
</tr>
</tbody>
</table>

**GEOGRAPHICAL INFORMATION SYSTEMS CONCENTRATION (GIS)**

(Leading to the Bachelor of Science Degree)

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 1020 Field Experiences in the Geosciences</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 1040 The Dynamic Earth</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 1045 Earth Environment, Resources &amp; Society</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1110 General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1120 General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>MATH</td>
<td>3-5</td>
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Total 32-34

**Sophomore Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GEOL 2500 Geologic Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>CSC 1070 Elementary Programming</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 2010, 2020 or BIO 1020, 3130</td>
<td>8</td>
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<tr>
<td>MATH 3070 Statistical Methods I</td>
<td>3</td>
</tr>
<tr>
<td>Humanities/Fine Arts Electives</td>
<td>6</td>
</tr>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 4510 Theory of GIS, I</td>
<td>3</td>
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</table>

Total 29

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**Geographical Information Systems (GIS) Concentration Required Courses (15 hours)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CSC 1070 Elementary Programming</td>
<td>3</td>
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<tr>
<td>GEOG 4210 Cartography</td>
<td>3</td>
</tr>
<tr>
<td>GEOL (GEOG) 4410 Remote Sensing</td>
<td>3</td>
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<tr>
<td>GEOG 4650 Environmental Applications of GIS</td>
<td>3</td>
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<tr>
<td>GEOG 4850 Advanced GIS</td>
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</table>

**Geographic Information Systems (GIS) Concentration Directed Electives, any three of the following seven courses (9-10 hours)**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>GEOL 1010 Weather and Climate</td>
<td>3</td>
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<tr>
<td>GEOL 1110 World Geography</td>
<td>3</td>
</tr>
<tr>
<td>GEOL (GEOG) 3200 Water Resources</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3080 or PSY 3010</td>
<td>3</td>
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<tr>
<td>GEOG 3010 Geography of the U.S.</td>
<td>3</td>
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<tr>
<td>GEOG (GEOG) 4150 Geomorphology</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 4511 Theory of GIS, II</td>
<td>3</td>
</tr>
<tr>
<td>GEOG (GEOG) 4711 Hydrogeology</td>
<td>4</td>
</tr>
</tbody>
</table>

**GEOGRAPHY CONCENTRATION (GEOG)**

(Leading to the Bachelor of Science Degree)

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 1020 Field Experiences in the Geosciences</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 1040 The Dynamic Earth</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 1045 Earth Environment, Resources &amp; Society</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
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<tr>
<td>MATH</td>
<td>3-5</td>
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</table>

Total 32-34
### Geography Concentration

#### Geography Concentration Required Courses (18 hours)
- GEOG 1010 Weather and Climate
- GEOG 1120 Human Geography
- GEOG 1130 Geography of Natural Hazards
- GEOG 3200 Water Resources
- GEOG 4210 Cartography
- GEOG 4650 Environmental Applications of GIS

#### Geography Concentration Directed Electives, any four of the following courses (12-14)
- GEOG 105 World Regional Geography (RODP)
- GEOG 1110 World Geography
- GEOL 2000 Earth Evolution and Life History
- GEOG 3710 Geography of the U.S.
- GEOG 4150 Geomorphology
- GEOG 4410 Remote Sensing
- GEOG 4511 Theory of GIS, II
- GEOG 4711 Hydrogeology
- GEOG 4850 Advanced GIS

---

### Geology Concentration Required Courses (15-16 hours)

- GEOL 2500 Geologic Fundamentals
- One required course from Geology concentration
- PHYS 2010, 2020 or BIOL 1020, 3130
- MATH 3070 Statistical Methods I
- Humanities/Fine Arts Electives
- ENGL 2130, 2230, or 2330
- GEOL 4510 Theory of GIS, I

**Total:** 29

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### Senior Year

- GEOL 4930 Senior Thesis
- GEOL 4931 Senior Thesis
- Directed electives from Geology Concentration
- Free Electives

**Total:** 26-32
Tennessee Technological University

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
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<tr>
<td>GEOL 4110</td>
<td>Sedimentation and Stratigraphy</td>
<td>4</td>
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### Geology Concentration Directed Electives (3 of 6 required; can be applied to free electives)

- GEOL 3120 Mineralogy | 4
- GEOL 3350 Paleobiology | 3
- GEOL 3410 Paleontology | 4
- GEOL 4150 Geomorphology | 4
- GEOL 4210 Advanced Historical Geology | 3
- GEOL 4610 Optical Mineralogy and Petrography | 4
- GEOL 4711 Hydrogeology | 4

### HISTORY (HIBA)

(Leading to the Bachelor of Arts Degree)

#### Freshman Year

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<tr>
<th>Course</th>
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<tr>
<td>HIST 1020 or 1120</td>
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<tr>
<td>HIST 3410 Introduction of Historical Methods</td>
<td>3</td>
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<tr>
<td>MATH</td>
<td>3</td>
<td></td>
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<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
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<td>ENGL 1020 Writing II</td>
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#### Sophomore Year

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<tr>
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<td>HIST 2020 American History II</td>
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<tr>
<td>Humanities/Fine Arts Electives</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SPCH 2410 Introduction to Speech Communication</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Foreign Language 1</td>
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<tr>
<td>Science</td>
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<td>Total</td>
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#### Junior Year

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<tr>
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<tr>
<td>HIST (Upper Division)</td>
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<tr>
<td>ENGL, JOUR, LING, SPCH, THEA, or WEBD (Upper Division)</td>
<td>3</td>
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<tr>
<td>CJ, POLS, SOC or SW (Upper Division)</td>
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</tr>
<tr>
<td>Foreign Language 1</td>
<td>6</td>
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<tr>
<td>Electives or minor</td>
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<td></td>
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<tr>
<td>Total</td>
<td>30</td>
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#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HIST 4990 Senior Seminar</td>
<td>3</td>
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<tr>
<td>HIST (Upper Division)</td>
<td>9</td>
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<tr>
<td>Electives or minor</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Total</td>
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</tbody>
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---

1 Foreign Language for the B.A. degree: 
Proficiency level in one language to include both (1) and (2) below: 
(1) Proficiency through the 2020 level in one language and (2) Six semester hours of upper division courses in the same language.

### 2011-12 Undergraduate Catalog

#### HISTORY (HIBS)

(Leading to the Bachelor of Science Degree)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Freshman Year</td>
<td>HIST 1010 or 1110</td>
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</tr>
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<td>Freshman Year</td>
<td>HIST 1020 or 1120</td>
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<tr>
<td>Freshman Year</td>
<td>MATH</td>
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<tr>
<td>Freshman Year</td>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>Freshman Year</td>
<td>ENGL 1020 Writing II</td>
<td>3</td>
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<td>Freshman Year</td>
<td>Science 1</td>
<td>8</td>
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<tr>
<td>Freshman Year</td>
<td>Elective</td>
<td>3</td>
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<td>Total</td>
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<table>
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<th>Semester</th>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Sophomore Year</td>
<td>HIST 2010 American History I</td>
<td>3</td>
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<tr>
<td>Sophomore Year</td>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
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<td>Sophomore Year</td>
<td>Humanities/Fine Arts Electives</td>
<td>6</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td>ENGL 2130, 2230, or 2330</td>
<td>3</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td>SPCH 2410 Introduction to Speech Communication</td>
<td>3</td>
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<tr>
<td>Sophomore Year</td>
<td>Foreign Language, any course (2-3 credits) or MATH 1910 (4 credits)</td>
<td>3</td>
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<tr>
<td>Sophomore Year</td>
<td>Foreign Language, any course (2-3 credits) or MATH 1920 (4 credits)</td>
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<tr>
<td>Sophomore Year</td>
<td>Social/Behavioral Science Electives</td>
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<tr>
<td>Sophomore Year</td>
<td>Elective</td>
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<tbody>
<tr>
<td>Junior Year</td>
<td>HIST (Upper Division)</td>
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<tr>
<td>Junior Year</td>
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<tr>
<td>Junior Year</td>
<td>CJ, POLS, SOC or SW (Upper Division)</td>
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<tr>
<td>Junior Year</td>
<td>Foreign Language 1010, 2010 or 2020 (2-3 credits) or MATH 2110 (4 credits)</td>
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<td>Electives or minor</td>
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<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Senior Year</td>
<td>HIST 4990 Senior Seminar</td>
<td>3</td>
</tr>
<tr>
<td>Senior Year</td>
<td>HIST (Upper Division)</td>
<td>9</td>
</tr>
<tr>
<td>Senior Year</td>
<td>Electives or minor</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
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</tr>
</tbody>
</table>

1 Fifteen credit hours of science with at least eight credit hours completed in the same discipline. HIST 3900, HIST 4290, HIST 4810 or MATH 4610 may substitute for three of the 15 total credit hours.

#### HUMAN ECOLOGY (HEC)

(Leading to the Bachelor of Science Degree, Non-Licensure)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Freshman Year</td>
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<td>Freshman Year</td>
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<tr>
<td>Freshman Year</td>
<td>Science 1</td>
<td>8-12</td>
</tr>
</tbody>
</table>
Tennessee Technological University

2011-12 Undergraduate Catalog

FAMILY & CONSUMER SCIENCES EDUCATION (HEED)
(Leading to the Bachelor of Science in Human Ecology Degree)

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>ART 1030 Art Appreciation</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1010 Introduction to Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1020 Introduction to Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
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</tr>
<tr>
<td>MATH 1010 Introduction to Contemporary Mathematical Ideas</td>
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</tr>
<tr>
<td>HEC 1000 Introduction to the Profession</td>
<td>1</td>
</tr>
<tr>
<td>HEC 1010 Life Span Development</td>
<td>3</td>
</tr>
<tr>
<td>HEC 1030 Introduction to Nutrition</td>
<td>2</td>
</tr>
<tr>
<td>HEC 2031 Aspects of Dress</td>
<td>3</td>
</tr>
<tr>
<td>HEC 2032 Construction and Analysis of Sewn Products</td>
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<td>Total</td>
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</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
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<tr>
<td>HEC 1010, 1020, 1030 or 2020, 2031 or 2041</td>
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<tr>
<td>HEC 2060 The Family System</td>
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<tr>
<td>HEC 2400 Children with Special Needs</td>
<td>3</td>
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<tr>
<td>EXPW 2430 First Aid, Safety &amp; CPR</td>
<td>2</td>
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<td>Total</td>
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</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>ART 1030 or MUS 1030</td>
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<tr>
<td>Humanities/Fine Arts Elective</td>
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<tr>
<td>HEC 3520 Parent Education &amp; Child Guidance</td>
<td>2</td>
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<tr>
<td>ECSP 3001 Curriculum for Infants, Toddlers &amp; Preschoolers</td>
<td>2</td>
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<td>FOED 2011, 1820 or DS 2810</td>
<td>3</td>
</tr>
<tr>
<td>HEC 2500 Creative Play</td>
<td>2</td>
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<tr>
<td>HEC 3500 Development: Middle Childhood/Adolescence</td>
<td>3</td>
</tr>
<tr>
<td>HEC Electives</td>
<td>3</td>
</tr>
<tr>
<td>SOC 3650 Juvenile Delinquency</td>
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<table>
<thead>
<tr>
<th>Senior Year</th>
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<tbody>
<tr>
<td>HEC 4000 Professional Integration &amp; Communication Techniques</td>
<td>1</td>
</tr>
<tr>
<td>HEC 4600 Family Development &amp; Relationships</td>
<td>3</td>
</tr>
<tr>
<td>HEC 4610 Families: Normative/Catastrophic Issues</td>
<td>3</td>
</tr>
<tr>
<td>HEC 4990 Internship</td>
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</tr>
<tr>
<td>HEC 3700 Development: Young Adulthood/Aging</td>
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</tr>
<tr>
<td>ECSP 4300 Assessment of Young Children</td>
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<td>EXPW 2150 Human Sexuality</td>
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1 Select 8 to 12 hours for Natural Science.
   BIOL 1310, CHEM 1310, GEOL 1310 and PHYS 1310 OR BIOL 1010 and 1020 OR BIOL 2010 and 2020
2 HEC-CDFR students must take HEC 2031, HEC 2041 and either HEC 1030 or HEC 2020.
3 Total credit hours for program must total to 120 hours. Three hours must be upper-division.
FOOD, NUTRITION, & DIETETICS (HEFO)

DIETETICS OPTION¹

(Leading to the Bachelor of Science in Human Ecology Degree)

Freshman Year sem. hrs.
HEC 1000 Introduction to the Profession ................ 1
HEC 1010 Life Span Development .......................... 3
HEC 1020 Social Intelligence .................................. 1
HEC 2060 The Family System .................................. 2
CHEM 1010 Introduction to Chemistry I .................. 4
CHEM 1020 Introduction to Chemistry II ................. 4
ENGL 1010 Writing I ........................................... 3
ENGL 1020 Writing II ......................................... 3
HIST 2010 American History I .............................. 3
MATH 1130 College Algebra .................................. 3
SPCH 2410 Introduction to Speech
  Communication .................................................. 3
Total 30

Sophomore Year sem. hrs.
HEC 2020 Nutrition .............................................. 3
HEC 2031 or HEC 2041 ......................................... 3
HEC 2240 Food Preparation & Management .............. 4
HEC 3011 Consumer Economics .............................. 3
CHEM 3005 Elementary Organic Chemistry .............. 4
ENGL 2130, 2230, or 2330 ................................... 3
BIOL 1010 Introduction to Biology I ....................... 4
BIOL 2350 Introductory Anatomy & Physiology .......... 4
SOC 1010 or 1100 ............................................... 3
MATH 1530 Elementary Probability & Statistics ........ 3
Total 34

Junior Year sem. hrs.
HEC 3201 Community Nutrition .............................. 3
HEC 3240 Quantity Food Production ........................ 4
HEC 3270 Nutrition in Disease .............................. 3
HEC 4110 Experimental Food Sciences .................... 4
BIOL 3230 Health Science Microbiology ................. 4
CHEM 4500 Physiological Chemistry ...................... 3
HIST 2020 American History II ............................ 3
PSY 2010 General Psychology ............................... 3
Electives .................................................................. 2
Total 29

Senior Year sem. hrs.
Humanities/Fine Arts Electives² ......................... 6
HEC 4000 Professional Integration &
  Communication Techniques ................................ 1
HEC 4200 Advanced Nutrition ................................ 3
HED 4210 Medical Terminology for the Human
  Sciences ............................................................. 1
HEC 4241 Legal Issues in Food Service
  Management ...................................................... 1
HEC 4242 Food Systems Administration ................ 3
HEC 4271 Medical Nutrition Therapy .................... 3
HEC 4272 Clinical Dietetics ................................. 3
HEC 4994 Field Experience—Health Care* ............. 3
BMGT 3510 Management & Organization Behavior .... 3
Total 27

FOOD, NUTRITION, & DIETETICS (HEFO)

FOOD SYSTEMS ADMINISTRATION OPTION

(Leading to the Bachelor of Science in Human Ecology Degree)

Freshman Year sem. hrs.
HEC 1000 Introduction to the Profession ................ 1
HEC 1010 Life Span Development .......................... 3
HEC 1020 Social Intelligence .................................. 1
HEC 2060 The Family System .................................. 2
ENGL 1010 Writing I ........................................... 3
ENGL 1020 Writing II ......................................... 3
HIST 2010 American History I .............................. 3
HEC 3240 Quantity Food Production ...................... 6
HEC 3241, 3242 Culinary Applications I, II .............. 6
HIST 2020 American History II ............................ 3
Electives .................................................................. 6
Total 30

Sophomore Year sem. hrs.
HEC 2020 Nutrition .............................................. 3
HEC 2031 Aspects of Dress .................................... 3
HEC 2041 Aspects of Housing & Furnishings .......... 3
HEC 2240 Food Preparation & Management ........... 3
HEC 3011 Consumer Economics ............................ 3
HEC 4241 Legal Issues in Food Service ................. 1
ENGL 2130, 2230, or 2330 .................................. 3
BIOL 1010 Introduction to Biology I ....................... 4
BIOL 3230 Health Sciences Microbiology ............... 4
MATH 1530 Elementary Probability & Statistics ........ 3
Total 30

Junior Year sem. hrs.
HEC 3240 Quantity Food Production ...................... 4
HEC 3270 Nutrition in Disease .............................. 3
HEC 3241, 3242 Culinary Applications I, II .............. 6
HIST 2020 American History II ............................ 3
Electives .................................................................. 6
PSY 2010 General Psychology ............................... 3

¹ The Dietetics Option is an accredited Didactic Program in Dietetics (DPD) by the Commission on Accreditation for Dietetics Education, American Dietetic Association.
² Select a humanities/fine arts course from the general education list.

In order to become a Registered Dietitian (R.D.) and/or a Licensed Dietitian/Nutritionist (L.D.N.) in Tennessee:

1. After graduation, complete a postgraduate Dietetic (DI).

Address:
120 South Riverside Plaza
Chicago, IL 60060-6995
Phone: 312-899-0040

American Dietetic Association.

FOOD, NUTRITION, & DIETETICS (HEFO)

FOOD SYSTEMS ADMINISTRATION OPTION

(Leading to the Bachelor of Science in Human Ecology Degree)

Freshman Year sem. hrs.
HEC 1000 Introduction to the Profession ................ 1
HEC 1010 Life Span Development .......................... 3
HEC 1020 Social Intelligence .................................. 1
HEC 2060 The Family System .................................. 2
CHEM 1010 Introduction to Chemistry I .................. 4
CHEM 1020 Introduction to Chemistry II ................. 4
ENGL 1010 Writing I ........................................... 3
ENGL 1020 Writing II ......................................... 3
HIST 2010 American History I .............................. 3
HEC 3240 Quantity Food Production ...................... 6
HEC 3241, 3242 Culinary Applications I, II .............. 6
HIST 2020 American History II ............................ 3
Electives .................................................................. 6
Total 30

Sophomore Year sem. hrs.
HEC 2020 Nutrition .............................................. 3
HEC 2031 Aspects of Dress .................................... 3
HEC 2041 Aspects of Housing & Furnishings .......... 3
HEC 2240 Food Preparation & Management ........... 3
HEC 3011 Consumer Economics ............................ 3
HEC 4241 Legal Issues in Food Service ................. 1
ENGL 2130, 2230, or 2330 .................................. 3
BIOL 1010 Introduction to Biology I ....................... 4
BIOL 3230 Health Sciences Microbiology ............... 4
MATH 1530 Elementary Probability & Statistics ........ 3
Total 30

Junior Year sem. hrs.
HEC 3240 Quantity Food Production ...................... 4
HEC 3270 Nutrition in Disease .............................. 3
HEC 3241, 3242 Culinary Applications I, II .............. 6
HIST 2020 American History II ............................ 3
Electives .................................................................. 6
PSY 2010 General Psychology ............................... 3

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American Dietetic Association.

* Requires professional liability insurance (approx. $15) and personal liability for travel or injury.
**Tennessee Technological University**

ACCT 2110 Principles of Financial Accounting ..........3
ECON 2010 Principles of Microeconomics ..........3
Electives ................................................................6
Total ...................................................................31

**Senior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>BMGT 3510 Management &amp; Organization Behavior</td>
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<td>BMGT 3630 Human Resource Management</td>
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<td>HEC 4000 Professional Integration &amp; Communication Techniques</td>
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<tr>
<td>HEC 4110 Experimental Food Sciences</td>
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<td>HEC 4241 Legal Issues in Food Service Management</td>
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<td>HEC 4242 Food Systems Administration</td>
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<tr>
<td>HEC 4992 and/or HEC 4993</td>
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<tr>
<td>MKT 3310 Services Marketing</td>
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<tr>
<td>Electives (5 Upper-Division)</td>
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</table>

1 Select a humanities/fine arts course from the general education list.

To complete certification as a School Food Service Supervisor:

Add School Food Service Field Experience 4250 and SPED 3000.

To be eligible to apply for an Environmental Health Specialist, twenty-four credits in natural sciences is required.

**NOTE:** This option does NOT include courses required to complete the Didactic Program in Dietetics. See Dietetics Option for courses and other requirements to become a Registered Dietitian (R.D.).

**HOUSING AND DESIGN (HEHO)**

*(Leading to the Bachelor of Science in Human Ecology Degree)*

**Freshman Year**

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<td>ART 1030 Art Appreciation</td>
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<td>CHEM 1010 Introduction to Chemistry I</td>
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<td>MATH 1010 or 1530</td>
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<td>MATH 1130 College Algebra</td>
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**Sophomore Year**

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<td>HEC 2031 Aspects of Dress</td>
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<tr>
<td>HEC 2060 The Family System</td>
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<tr>
<td>HEC 2411 Practicum: Housing &amp; Design</td>
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<tr>
<td>HEC 2421 Architectural Graphics &amp; Presentation Techniques</td>
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<td>HEC 2431 Residential Design I</td>
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<tr>
<td>HEC 2440 Computer Aided Design of Residence</td>
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<td>ENGL 2130, 2230, or 2330</td>
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<tr>
<td>PSY 2010 General Psychology</td>
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<td>SPCH 2410 or PC 2500</td>
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**Junior Year**

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<tr>
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<td>HEC 3320 Textiles II</td>
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<td>HEC 3431 Residential Design II</td>
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<td>HEC Upper-Division Elective</td>
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<tr>
<td>DS 2810 Computer Applications in Business</td>
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<tr>
<td>ECON 2010 Principles of Microeconomics</td>
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<tr>
<td>ECON 2020 Principles of Macroeconomics</td>
<td>3</td>
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<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
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<td>HIST 2020 American History II</td>
<td>3</td>
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<tr>
<td>Humanities/Fine Arts Elective</td>
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<tr>
<td>HEC 3350 Merchandising I</td>
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<td>HEC 3420 Merchandising</td>
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**Senior Year**

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<tr>
<td>HEC 3011 Consumer Economics</td>
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<td>HEC 4000 Professional Integration &amp; Communication Techniques</td>
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<td>HEC 4450 Commercial Design</td>
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<td>HEC 4460 Historical and Contemporary Architecture &amp; Furnishings</td>
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<td>HEC Upper Division Elective</td>
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<tr>
<td>AGHT Elective 3400, 3440, 3460 or 3480</td>
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<tr>
<td>FIN 3410 Principles of Real Estate</td>
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<td>MKT 3400 Principles of Marketing</td>
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**MERCANDISING AND DESIGN (HEME)**

*(Leading to the Bachelor of Science in Human Ecology Degree)*

**Freshman Year**

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<td>HEC 1000 Introduction to the Profession</td>
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<tr>
<td>HEC 2031 Aspects of Dress</td>
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<tr>
<td>CHEM 1010 Introduction to Chemistry I</td>
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<td>CHEM 1020 Introduction to Chemistry II</td>
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<tr>
<td>MATH 1010 Introduction to Contemporary Mathematical Ideas</td>
<td>3</td>
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<td>SOC 1010 Introduction to Sociology</td>
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<td>ENGL 1010 Writing I</td>
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<td>ENGL 1020 Writing II</td>
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**Sophomore Year**

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<thead>
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<th>Course</th>
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<tbody>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
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</tr>
<tr>
<td>DS 2810 Computer Applications in Business</td>
<td>3</td>
</tr>
<tr>
<td>HEC 2032 Construction and Analysis of Sewn Products</td>
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<td>HEC 2060 The Family System</td>
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<tr>
<td>HEC 2300, 3300, 4340 or 4990</td>
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<tr>
<td>HEC 2311 Practicum: Merchandising &amp; Design</td>
<td>1</td>
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<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
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<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
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<tr>
<td>MATH 1530 Elementary Probability &amp; Statistics</td>
<td>3</td>
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<tr>
<td>SPCH 2410 or PC 2500</td>
<td>3</td>
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</table>
Tennessee Technological University

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>ECON 2010 Principles of Microeconomics</td>
<td>3</td>
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<tr>
<td>HEC 3011 Consumer Economics</td>
<td>3</td>
</tr>
<tr>
<td>HEC 3420 Housing</td>
<td>3</td>
</tr>
<tr>
<td>HEC 3310 Textiles I</td>
<td>3</td>
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<tr>
<td>HEC 3320 Textiles II</td>
<td>3</td>
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<tr>
<td>HEC 3350 Merchandising I</td>
<td>3</td>
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<tr>
<td>ACCT 2110 Principles of Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2020 Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>MKT 3400 Principles of Marketing</td>
<td>3</td>
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<tr>
<td>PSY 2010 General Psychology</td>
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<th>Senior Year</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>HEC 4000 Professional Integration &amp; Communication Techniques</td>
<td>1</td>
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<tr>
<td>HEC 4320 Merchandise Promotion &amp; Advertising</td>
<td>3</td>
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<tr>
<td>HEC 4360 Merchandising II</td>
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<td>Humanities/Fine Arts Electives</td>
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<tr>
<td>Electives (5 hours must be upper-division)</td>
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<td>HEC 4600; IBC 4980 or 4990; SOC 3150; or PSY 3300, 3400, or 3410</td>
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<td>Upper Division Business Elective</td>
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**INDUSTRIAL ENGINEERING (IE)**

(Leading to the Bachelor of Science in Industrial Engineering Degree)

<table>
<thead>
<tr>
<th>Freshman Year</th>
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<tbody>
<tr>
<td>ENGR 1110 Engineering Graphics</td>
<td>2</td>
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<tr>
<td>ENGR 1210 Introduction to Engineering</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 1120 Programming for Engineers</td>
<td>2</td>
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<tr>
<td>CHEM 1110 General Chemistry I</td>
<td>4</td>
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<td>CHEM 1120 General Chemistry II</td>
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<td>ENGL 1010 Writing I</td>
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<tr>
<td>MATH 1910 Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 1920 Calculus II</td>
<td>4</td>
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<tr>
<td>Humanities/Fine Arts Electives</td>
<td>6</td>
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<tr>
<td>ENGR 1020 Connections to Engineering &amp; Technology</td>
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<td><strong>Total</strong></td>
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<tbody>
<tr>
<td>ECON 2010 Principles of Microeconomics</td>
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<td>ECON 2020 Principles of Macroeconomics</td>
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<td>ISE 2000 Introduction to Industrial Engineering &amp; Computers</td>
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<td>ENGL 2130, 2230, or 2330</td>
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<tr>
<td>MATH 2110 Calculus III</td>
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<td>MATH 2010 Elementary Matrix Algebra</td>
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<tr>
<td>CEE 2110 Statics</td>
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<tr>
<td>PHYS 2110, 2111 Calculus-based Physics I</td>
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<td>ACCT 2120 Principles of Managerial Accounting</td>
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**2011-12 Undergraduate Catalog**

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<tr>
<td>ISE 3100 Engineering Economy</td>
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<tr>
<td>ISE 3200 Engineering Statistics</td>
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<td>ISE 3240 Statistical Methods for Process Engineering</td>
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<td>ISE 3310 Process Improvement Techniques</td>
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<td>ISE 3400 Operations Research</td>
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<td>ISE 3410 Simulation of Industrial Systems</td>
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<td>ISE 3800 Information Systems for Industrial Engineering</td>
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<td>ISE 3900 Industrial Engineering Seminar</td>
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<td>ISE 4000 Engineering Leadership &amp; Project Management</td>
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<td>MATH 2120 Differential Equations</td>
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<tr>
<td>CEE 3110 Mechanics of Materials</td>
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<tr>
<td>ECE 3810 Fundamentals of Electrical Engineering I</td>
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<tr>
<td>ECE 3860 Fundamentals of Electrical Engineering Laboratory</td>
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<td>ISE 4500 Facilities &amp; Material Handling Systems Design</td>
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<td>ISE 4510 Engineering Design Internship</td>
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1. This course not included in 120-hour curriculum.
2. ECON 2010 and 2020 satisfy the General Education Social/Behavioral Science requirements.
3. Approved Science Option: Either (1) BIOL 2350 Intro to Anatomy and Physiology or (2) PHYS 2120 Calculus-based Physics II Lab
4. Current list of approved ISE electives is available in the department.

**INDUSTRIAL TECHNOLOGY (IT)**

(Leading to the Bachelor of Science in Industrial Technology Degree)

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<td>ENGR 1120 Programming for Engineers</td>
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<td>ENGR 1210 Introduction to Engineering</td>
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<td>CHEM 1110 Introduction to Chemistry I</td>
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<td>MIT 1110 Materials of Manufacturing</td>
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<td>MATH 1730 Pre-calculus Mathematics</td>
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<td>MATH 1910 Calculus I</td>
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<tbody>
<tr>
<td>ECON 2010 Principles of Microeconomics</td>
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</tr>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
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Tennessee Technological University

2011-12 Undergraduate Catalog

Electives^4 ................................................................. 12
Total 30

Junior Year

Concentration Area^1,2 ............................................... 12
Electives^3 ................................................................. 18
Total 30

Senior Year

Concentration Area^1,2 ............................................... 12
Electives^3 ................................................................. 15
UNIV 4995 or 4996 .................................................. 3 or 4
Total 31

1 Concentration area courses must be upper division (3000, 4000).
2 Concentration area #1 must be different from concentration area #2.
3 UNIV 4996 (four hrs) may be substituted from UNIV 4995 (three hrs) in order to meet graduation hour requirements.
4 Eighteen hours of the elective hours must be upper division (3000, 4000).
A total of 12 hours out of the 120 hours must be at the 4000 level.
No more than 24 hours in business courses can be used toward graduation.

Students must complete at least 60 hours at the university (4-year) level and at least 30 hours at TTU.

INTERNATIONAL BUSINESS AND CULTURES (IBAC)

(Leading to the Bachelor of Science Degree)

Track I

Freshman Year

UBUS 1020 Success Skills for Business Studies .......................... 1
ENGL 1010 Writing I ................................................... 3
ENGL 1020 Writing II ................................................... 3
MATH ................................................................. 3
Natural Sciences .......................................................... 8
Humanities/Fine Arts Electives ........................................... 6
Electives^3 ................................................................. 7
Total 30

Sophomore Year

ACCT 2110 Principles of Financial Accounting .......................... 3
ACCT 2120 Principles of Managerial Accounting ......................... 3
ECON 2010 Principles of Microeconomics ................................ 3
ECON 2020 Principles of Macroeconomics ................................ 3
ENGL 2330 World Literature .............................................. 3
Foreign Language 3010, 3020 ........................................... 6
HIST 2010 American History I ........................................... 3
HIST 2020 American History II ........................................... 3
PC 2500 or SPCH 2410 .................................................. 3
Total 30

INTERDISCIPLINARY STUDIES (LIST)

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<tr>
<td>MATH</td>
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<tr>
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<td>8</td>
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<tr>
<td>HIST 2020 American History II</td>
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<tr>
<td>PC 2500 or SPCH 2410</td>
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<td>sem. hrs.</td>
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<tr>
<td>BMGT 3510 Management &amp; Organization Behavior</td>
<td>3</td>
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<tr>
<td>BMGT 3600 International Management</td>
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<tr>
<td>ECON 3320, 3810, or 3820</td>
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</tr>
<tr>
<td>ECON 3610 Business Statistics I</td>
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<tr>
<td>FIN 3210 Principles of Managerial Finance</td>
<td>3</td>
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<tr>
<td>MKT 3400 Principles of Marketing</td>
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<tr>
<td>Foreign Language 3200</td>
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**Track 2**

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<th>Sophomore Year</th>
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<td>UBUS 1020 Success Skills for Business Studies</td>
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<td>ACCT 2110 Principles of Financial Accounting</td>
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<td>ENGL 1010 Writing I</td>
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<td>ACCT 2120 Principles of Managerial Accounting</td>
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<td>ECON 2010 Principles of Microeconomics</td>
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<td>HIST 1110 World Civilization I</td>
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<td>HIST 2020 American History II</td>
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<td>DS 2810 Computer Applications in Business</td>
<td>3</td>
<td>HEC 1020 Social Intelligence</td>
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<td>Total</td>
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1. Elective courses are to be selected in consultation with the academic advisor.
2. Students may choose from the following: ENGL 4680, 4720; FREN 3510; GERM 3510 or 3520; JAPN 3510; RUSS 3510; SPAN 3510 or 3550; GEOG 1110, 1120, 1130, 3200; HIST 3710, 4440, 4550, 4560, 4570, 4620, 4710, 4730, 4740, 4750, 4760, 4790; PHIL 4020; POLS 3000, 3310, 4510, 4960; SOC 2100, 4090; or MUS 2030.
3. Students may choose from the following: ENGL 4610, 4711, 4830; HIST 4010 through 4060, 4210, 4230, 4250, 4310, 4330, 4360, 4370, 4380, 4730; JOUR 3760; POLS 3700, 3710, 3800, 4210, and SOC 2840.

The following restrictions apply to both Track 1 and Track 2 IBCA majors:

a) IBCA majors may not take business courses on a pass/fail basis.
b) IBCA majors must take at least 50 percent of the total hours required for the degree in courses offered outside the College of Business.
c) IBCA majors must earn at least 50 percent of the business hours required for the degree at Tennessee Technological University.
d) IBCA majors must complete at least 50 percent of the upper-division business hours at Tennessee Technological University.

**MARKETING (MKT)**

(Leading to the Bachelor of Science in Business Administration degree)

For courses in the freshman and sophomore years, see Basic Business (page 111).

<table>
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<th>Sophomore Year</th>
<th>sem. hrs.</th>
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<td>MKT 3400 Principles of Marketing</td>
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Tennessee Technological University

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<td>DS 3841 Management Information Systems</td>
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<tr>
<td>ECON 3610 Business Statistics I</td>
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<td>3</td>
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**Senior Year**

<table>
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<td>MKT 4620 Marketing Research</td>
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<td>MKT 4730 Marketing Strategy</td>
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<td>BMGT 4930 Business Strategy</td>
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<td>LAW 3810 Business Legal Environment and Ethics</td>
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<td>Non-business elective†</td>
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† Electives are to be selected in consultation with the academic advisor.

**MATHMATICS (MATH)**

*(Leading to the Bachelor of Science Degree)*

**Freshman Year**

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<td>MATH 1920 Calculus II</td>
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<tr>
<td>ENGL 1010 Writing I</td>
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<td>3</td>
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<td>MATH 1020 First-Year Connections†</td>
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**Sophomore Year**

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<td>MATH 2110 Calculus III</td>
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<td>4</td>
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<tr>
<td>MATH 2120 or 3810</td>
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<tr>
<td>MATH 3400 Introduction to Concepts of Mathematics</td>
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<td>PC 2500 or SPCH 2410</td>
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<td>Social/Behavioral Science Electives</td>
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<tr>
<td>CSC 2100 Introduction to Problem Solving and Computer Programming</td>
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**Junior Year**

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<td>MATH 4010 Modern Algebra I</td>
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<td>MATH 4530 Linear Algebra I</td>
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<tr>
<td>MATH 4470 Probability and Statistics I</td>
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<td>MATH 3430, 4410, or 4310</td>
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<td>HIST 2010 American History I</td>
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<td>HIST 2020 American History II</td>
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**Senior Year**

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<td>Mathematics§</td>
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† This course not included in 120-hour curriculum.

‡ ASTR 1010-1020; or BIOL 1010-1020; or BIOL 1110-1120; or CHEM 1010-1020; or CHEM 1110-1120; or GEOL 1040-1045; or PHYS 2110, 2111, 2120, 2121.

§ Upper division mathematics courses (3000 or higher). The student must complete three upper-division sequences. The approved sequences are organized into pure mathematics and applied mathematics categories as shown below. The student must complete at least one sequence from each category.

- **Applied Mathematics Sequence List:** MATH 4210-4220, 4250-4260; two of the three: 4350, 4360, or 4050; and 4470-4480.
- **Pure Mathematics Sequence List:** MATH 3430-3410; 4010-4020; 4110-4120; 4310-4320; 4530-4540; and 4850-4860.

A minor of 15 hours, including at least six upper division hours must be completed in a coherent program of study. The criterion for coherence may be met (1) by taking all minor courses in a single discipline (i.e., courses with the same prefix) or (2) by taking the courses prescribed in an approved interdisciplinary minor.

To allow students to prepare for different career paths, four optional tracks are available: Actuarial, Applied Mathematics, Pure Mathematics, and Statistics. The following are courses recommended (but not required) for students in each track.

- **Actuarial Track:** MATH 3070-3080, 4210-4220, 4470-4480, 4540; ECON 2010-2020; ACCT 2110-2120;FIN 2000, 3610; DS 2810, 3620. Students who wish to prepare for the second Actuarial Exam should obtain permission from the Graduate School to take MATH 6270.

- **Applied Mathematics Track:** MATH 2120, 3810, 4120, 4510, 4540. The sequence requirement should be met by choosing two sequences from the Applied Math Sequence List. It is recommended that the student minor in Computer Science.

- **Pure Mathematics Track:** MATH 3520, 4120, 4310, 4350-4360, and 4540.

- **Statistics Track:** MATH 3070-3080, 4210, 4470-4480, and 4540.
### Tennessee Technological University

#### MECHANICAL ENGINEERING (ME)

(Leading to the Bachelor of Science in Mechanical Engineering Degree)

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<td>Writing II</td>
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<td>MATH 1910</td>
<td>Calculus I</td>
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<td>MATH 1920</td>
<td>Calculus II</td>
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<tr>
<td>CHEM 1110</td>
<td>General Chemistry I</td>
<td>4</td>
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<tr>
<td>ENGR 1110</td>
<td>Engineering Graphics</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 1120</td>
<td>Programming for Engineers</td>
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<tr>
<td>Humanities/Fine Arts Electives</td>
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<tr>
<td>PHYS 2110, 2111</td>
<td>Calculus-based Physics I, Lab</td>
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<td>ENGR 1020</td>
<td>Connections to Engineering &amp; Technology</td>
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Total: 33 credits

### Sophomore Year

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<tr>
<td>MATH 2010</td>
<td>Elementary Matrix Algebra</td>
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<td>MATH 2011</td>
<td>Matrix Algebra Computer Lab</td>
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<td>MATH 2110</td>
<td>Calculus III</td>
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<td>MATH 2120</td>
<td>Differential Equations</td>
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<tr>
<td>CEE 2110</td>
<td>Statics</td>
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<td>CEE 3110</td>
<td>Mechanics of Materials</td>
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<td>ECE 2010</td>
<td>Electric Circuits I</td>
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<td>ME 2330</td>
<td>Dynamics</td>
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<td>PHYS 2120, 2121</td>
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### Junior Year

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<td>ME 3210</td>
<td>Thermodynamics I</td>
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<td>ME 3220</td>
<td>Thermodynamics II</td>
<td>3</td>
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<tr>
<td>ME 3720</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
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<td>ME 3710</td>
<td>Heat Transfer</td>
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<td>ME 3610</td>
<td>Dynamics of Machinery</td>
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<td>Materials &amp; Processes in Manufacturing</td>
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<td>ME 3023</td>
<td>Measurements in Mechanical Systems</td>
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<td>ME 3900</td>
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### Senior Year

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<td>Dynamic Modeling &amp; Controls</td>
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<td>ME area of concentration</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

Total: 34 credits

1. ENGR 1020 Connections to Engineering and Technology required in the first semester freshman year to fulfill TTU’s UNIV 1020 requirement. Does not count toward the 128 credit hour BSME degree.

### 2011-12 Undergraduate Catalog

#### MULTIDISCIPLINARY STUDIES (MDS)

#### ENGLISH AS A SECOND LANGUAGE (ESL)

(Leading to the Bachelor of Science Degree and the Tennessee Apprentice License Grades PreK-12)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Science</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>FOED 2011 Introduction to Teaching &amp; Technology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>FOED 1820 or 1822</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total: 28 credits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Sophomore Year |                |         |
| Freshman Year |                |         |
| Total: 146 credits |

| Junior Year |                |         |
| Freshman Year |                |         |
| Total: 35 credits |

| Senior Year |                |         |
| Freshman Year |                |         |
| Total: 35 credits |

Submit evidence of CPR Training

Those students who do not place at the 2010 level as determined by a proficiency test administered by the Department of Foreign Languages or those students who have
Tennessee Technological University

not taken two years of foreign language in high school will take 1010, 1020, and 2010 for nine hours in the same language.

GENERAL (MDSG)

(Leading to the Bachelor of Science, Non-Licensure)

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 1310, CHEM 1310, GEOL 1310, PHYS 1310 or Science Sequence¹</td>
<td>6-8</td>
</tr>
<tr>
<td>MATH 1010, 1130, 1410, 1530, 1630, 1710, 1830 or MATH 1410, 1420</td>
<td>6</td>
</tr>
<tr>
<td>Social/Behavioral Science Electives²</td>
<td>6</td>
</tr>
<tr>
<td>PHED</td>
<td>1</td>
</tr>
<tr>
<td>FOED 2011 Introduction to Teaching &amp; Technology</td>
<td>2</td>
</tr>
<tr>
<td>Total 24</td>
<td>-30</td>
</tr>
</tbody>
</table>

Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 2130, 2220, or 2330</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 1310, CHEM 1310, GEOL 1310, PHYS 1310 or Science Sequence¹</td>
<td>6-8</td>
</tr>
<tr>
<td>SPCH 2410 or PC 2500</td>
<td>3</td>
</tr>
<tr>
<td>Humanities/Fine Arts Electives³</td>
<td>6</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td>EXPW 2130 Concepts of Comprehensive Health</td>
<td>3</td>
</tr>
<tr>
<td>Total 30</td>
<td>-32</td>
</tr>
</tbody>
</table>

Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFS 2060, 2200, 3500, or 3520</td>
<td>2-3</td>
</tr>
<tr>
<td>Any two different areas from (ART 3200, MUS 3530, THEA 3500, any 3000/4000 level HIST, any 3000/4000 level PHIL, any 3000/4000 level PSY, any 3000/4000 level SOC)</td>
<td>5-6</td>
</tr>
<tr>
<td>EXPW 2430 or 3330</td>
<td>2-3</td>
</tr>
<tr>
<td>FOED 3010 Integrating Instructional Technology into the Classroom</td>
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</tr>
<tr>
<td>Total 30</td>
<td>-32</td>
</tr>
</tbody>
</table>

Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPY 2200, 3300, or PSY 4100</td>
<td>3</td>
</tr>
<tr>
<td>CJ 3650, CJ 4250, SOC 4510, SOC 4500, PSY 4130, PSY 4400 or EXPW 2160</td>
<td>3</td>
</tr>
<tr>
<td>READ/LSCI 4570 or PSY 4050</td>
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</tr>
<tr>
<td>Guided Electives</td>
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</tr>
<tr>
<td>Electives (36 hours of total program must be taken at the 3000/4000 level)</td>
<td>7</td>
</tr>
<tr>
<td>The program of study will total 120 hours</td>
<td>10-19</td>
</tr>
<tr>
<td>Total 32</td>
<td></td>
</tr>
</tbody>
</table>

¹ Complete a sequence (eight semester hours) or total of 12 semester hours selected from BIOL, CHEM, PHYS, or GEOL.
² Select two courses from: ANTH (SOC) 1100; ECON 2010, 2020; GEOG 1120; POLS 1000; PSY 2010 or SOC 1010.
³ Select two courses from: ART 1030; HIST 1010, 1020,
### Tennessee Technological University

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELED 4882</td>
<td>Professional Seminar II</td>
<td>2</td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>25</strong></td>
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</tbody>
</table>

Must provide evidence of first aid/safety/CPR training as prerequisite for student teaching.

### MIDDLE SCHOOL (MDMS)

(Leading to the Bachelor of Science Degree and the Tennessee Apprentice License Grades 4-8)

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL, CHEM, GEOL or PHYS 1310</td>
<td>6</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>FOED 2011 Introduction to Teaching &amp; Technology</td>
<td>2</td>
</tr>
<tr>
<td>FOED 1820 or 1822</td>
<td>1</td>
</tr>
<tr>
<td>SOC 1010 Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1410 Survey of Elementary Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1420 Survey of Elementary Mathematics II</td>
<td>3</td>
</tr>
<tr>
<td>PHED Activity</td>
<td>1</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
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</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>BIOL, CHEM, GEOL, or PHYS 1310</td>
</tr>
<tr>
<td>ENGL 2130 American Literature</td>
</tr>
<tr>
<td>ENGL 2230 or 2330</td>
</tr>
<tr>
<td>SPCH 2410 or PC 2500</td>
</tr>
<tr>
<td>GEOG 1120 Human Geography</td>
</tr>
<tr>
<td>EDPY 2200 Educational Psychology</td>
</tr>
<tr>
<td>ART 1030 or MUS 1030</td>
</tr>
<tr>
<td>MATH 1130 College Algebra</td>
</tr>
<tr>
<td>HIST 1110 World Civilization I</td>
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<tr>
<td><strong>Total</strong></td>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
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<tbody>
<tr>
<td>CUED 4150 Middle Level Curriculum</td>
</tr>
<tr>
<td>ELED 3140 Teaching of Social Studies</td>
</tr>
<tr>
<td>ELED 3150 Teaching of Mathematics</td>
</tr>
<tr>
<td>ELED 4140 Science for Elementary Teachers</td>
</tr>
<tr>
<td>ESLP 4100 ESL Methodology and Materials for PreK-12</td>
</tr>
<tr>
<td>FOED 3010 Integrating Instructional Technology into the Classroom</td>
</tr>
<tr>
<td>FOED 3800 Field Experiences in Education</td>
</tr>
<tr>
<td>FOED 3810 Field Experiences in Education</td>
</tr>
<tr>
<td>LSCI 4570 Books and Related Materials for Adolescents and Adults</td>
</tr>
<tr>
<td>POLS 1000 American Government</td>
</tr>
<tr>
<td>READ 3312 Literacy II</td>
</tr>
<tr>
<td>Electives</td>
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<tr>
<td><strong>Total</strong></td>
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</table>

### Senior Year

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEC 3500 Development: Middle Childhood/Adolescence</td>
</tr>
<tr>
<td>SPED 3000 Teaching Persons with Disabilities in the Regular Classroom</td>
</tr>
<tr>
<td>EDPY 3300 Evaluation &amp; Guidance</td>
</tr>
<tr>
<td>ELED 4870 Student Teaching I</td>
</tr>
<tr>
<td>ELED 4880 Student Teaching II</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

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### 2011-12 Undergraduate Catalog

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
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</thead>
<tbody>
<tr>
<td>ELED 4890</td>
<td>Seminar: Education &amp; Society</td>
<td>2</td>
</tr>
<tr>
<td>HIST 3100</td>
<td>Tennessee Topics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 2010</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

Submit evidence of CPR Training

### MUSIC (MUS)

### INSTRUCTIONAL LICENSURE (MUIN)

(Leading to the Bachelor of Music Degree and the Apprentice License, with endorsement, Grades K-12)

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNMU 1020 First-Year Connections</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
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<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
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<tr>
<td>Any General Education Math</td>
<td>3</td>
</tr>
<tr>
<td>MUS 1021 Class Voice Instruction I</td>
<td>1</td>
</tr>
<tr>
<td>MUS 1070 Concert Choir</td>
<td>2</td>
</tr>
<tr>
<td>MUS 1023 Intermediate Class Piano</td>
<td>1</td>
</tr>
<tr>
<td>Majors III</td>
<td>1</td>
</tr>
<tr>
<td>MUS 1024 Intermediate Class Piano</td>
<td>1</td>
</tr>
<tr>
<td>Majors IV</td>
<td>1</td>
</tr>
<tr>
<td>MUS 1030 Music Appreciation</td>
<td>3</td>
</tr>
<tr>
<td>Instrument Class</td>
<td>1</td>
</tr>
<tr>
<td>MUS 1120 Harmony I</td>
<td>3</td>
</tr>
<tr>
<td>MUS 1130 Aural Techniques I</td>
<td>1</td>
</tr>
<tr>
<td>MUS 1140 Harmony II</td>
<td>3</td>
</tr>
<tr>
<td>MUS 1150 Aural Techniques II</td>
<td>1</td>
</tr>
<tr>
<td>Applied Music</td>
<td>2</td>
</tr>
<tr>
<td>Major Ensemble</td>
<td>2</td>
</tr>
<tr>
<td>SPCH 2410 or PC 2500</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
</tr>
<tr>
<td>EDPY 2200 Educational Psychology</td>
</tr>
<tr>
<td>MUED 1820 Introduction to Music Education</td>
</tr>
<tr>
<td>MUS 3110 Harmony II</td>
</tr>
<tr>
<td>MUS 1210 Aural Techniques III</td>
</tr>
<tr>
<td>MUS 1230 Harmony IV</td>
</tr>
<tr>
<td>MUS 1240 Aural Techniques IV</td>
</tr>
<tr>
<td>MUS 3010 Music History &amp; Literature I</td>
</tr>
<tr>
<td>MUS 3020 Music History &amp; Literature II</td>
</tr>
<tr>
<td>MUS 4510 Computer Applications in Music</td>
</tr>
<tr>
<td>Natural Science Electives</td>
</tr>
<tr>
<td>Social/Behavioral Science Elective</td>
</tr>
<tr>
<td>Applied Music</td>
</tr>
<tr>
<td>Major Ensemble</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPY 3300 Evaluation &amp; Guidance</td>
</tr>
<tr>
<td>HIST 2010 American History I</td>
</tr>
<tr>
<td>HIST 2020 American History II</td>
</tr>
<tr>
<td>MUED 3110 Materials &amp; Methods in Music, Grades K-5</td>
</tr>
<tr>
<td>MUED 3130 Materials and Methods in Instrumental Music, Grades 6-12</td>
</tr>
<tr>
<td>MUED 3230 (Wind/Percussion Majors Only) or MUED 3735 (String Majors Only)</td>
</tr>
<tr>
<td>MUED 3820 Fundamentals of Conducting</td>
</tr>
</tbody>
</table>
Tennessee Technological University

MUED 3630 Instrumental Conducting & Literature........2
MUED 3810 (Fall only) Practicum in Music Education
  Education I ..........................................................1
MUED 3830 Practicum in Music Education II,
  Instrumental (Spring only) ................................1
Instrument Classes I ...............................................2
MUS 3130 Form & Analysis ..................................2
MUS 3210 Instrumentation .....................................2
Applied Music .......................................................1
Major Ensemble ....................................................2
Total 32

Senior Year
  Humanities/Fine Arts Elective ................................3
MUED 3735 String pedagogy and Literature I (String
  majors only) ......................................................2
MUED 4870 Student Teaching I ..................................5
MUED 4880 Student Teaching II .........................5
MUED 4890 Seminar: Education & Society ...........2
MUS 4000 Senior Recital ........................................1
Social/Behavioral Science Elective ..................3
SPED 3000 Teaching Persons with Disabilities in
  the Regular Classroom ........................................3
Instrument Classes I ...............................................2
Applied Music .......................................................1
Major Ensemble ....................................................1
Electives (One credit for string majors) ...............2
Total 28

1 This course credit not included in 128-hour curriculum.
2 Students with no vocal experience must enroll in
  one semester of MUS 1021, Class Voice, and
  one semester of MUS 1070, Concert Choir.
Students with previous vocal training enroll for
  two semesters in a choral ensemble (MUS
  1070).

VOCAL/GENERAL LICENSURE (MUVO)
(Leading to the Bachelor of Music Degree and the
Apprentice License, Grades K-12)

Freshman Year
  ENGL 2130, 2230 or 2330 ........................................3
MUED 1820 (Fall only) Introduction to Music
  Education ..........................................................1
MUS 2110 Harmony III .......................................2
MUS 2120 Aural Techniques III .............................1
MUS 2130 Harmony IV .........................................2
MUS 2140 Aural Techniques IV ..............................1
MUS 3010 Music History & Literature I .................3
MUS 3020 Music History & Literature II ................3
MUS 4510 Computer Applications in Music ............2
Natural Science Electives ......................................8
Social/Behavioral Science Elective ......................3
Applied Music .......................................................2
Major Ensemble ....................................................2
EDPU 2200 Educational Psychology .......................3
Total 36

Sophomore Year
  ENGL 2130, 2230 or 2330 ........................................3
MUED 1820 (Fall only) Introduction to Music
  Education ..........................................................1
MUS 2110 Harmony III .......................................2
MUS 2120 Aural Techniques III .............................1
MUS 2130 Harmony IV .........................................2
MUS 2140 Aural Techniques IV ..............................1
MUS 3010 Music History & Literature I .................3
MUS 3020 Music History & Literature II ................3
MUS 4510 Computer Applications in Music ............2
Any General Education Math ...............................3
MUS 1016 (Piano majors) Accompanying ..............2
MUS 1023 (voice majors) Intermediate Class Piano
  for Music Majors III ........................................1
MUS 1024 (voice majors) Intermediate Class Piano
  for Music Majors IV ........................................1
MUS 1030 Music Appreciation ............................3
MUS 1120 Harmony III .......................................1
MUS 1130 Aural Techniques I ................................1
MUS 1140 Harmony II .........................................3
MUS 1150 Aural Techniques II ................................1
MUS 1210 Diction for Singers I ............................1
MUS 1220 Diction for Singers II ............................1
Applied Music .......................................................2
Major Ensemble ....................................................2
ENMU 1020 First-Year Connections ......................1
EDPY 3300 Evaluation & Guidance .......................3
HIST 2010 American History I ............................3
HIST 2020 American History II ..........................3
MUED 3110 Materials & Methods in Music,
  Grades K-5 .......................................................3
MUED 3140 Materials & Methods in Vocal Music,
  Grades 6-12 .....................................................3
MUED 3620 Fundamentals of Conducting ...............1
MUED 3640 Choral Conducting & Literature ..........2
MUED 3810 (Fall only) Practicum in Music
  Education I ......................................................1
MUED 3840 Practicum in Music Education II,
  Vocal ..............................................................1
MUS 3130 Form & Analysis ................................2
 electives ..........................................................7
Applied Music .......................................................2
Major Ensemble ....................................................2
Total 33
Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities/Fine Arts Elective</td>
<td>3</td>
</tr>
<tr>
<td>Social/Behavioral Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>MUS 3240 Choral Literature</td>
<td>2</td>
</tr>
<tr>
<td>MUS 3800 Vocal Pedagogy &amp; Literature I</td>
<td>2</td>
</tr>
<tr>
<td>MUS 4000 Senior Recital</td>
<td>1</td>
</tr>
<tr>
<td>MUED 4870 Student Teaching I</td>
<td>5</td>
</tr>
<tr>
<td>MUED 4880 Student Teaching II</td>
<td>5</td>
</tr>
<tr>
<td>MUED 4890 Seminar: Education &amp; Society</td>
<td>2</td>
</tr>
<tr>
<td>SPED 3000 Teaching Persons with Disabilities in the Regular Classroom</td>
<td>3</td>
</tr>
<tr>
<td>Applied Music</td>
<td>1</td>
</tr>
<tr>
<td>Major Ensemble</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
</tr>
</tbody>
</table>

1 This course not included in 128-hour curriculum.
2 Must submit evidence of current First Aid/CPR training.

PRIMARY LICENSURE: VOCAL/GENERAL MUSIC EDUCATION

ADDITIONAL LICENSURE: INSTRUMENTAL MUSIC EDUCATION

The above curriculum is necessary for licensure in Vocal/General Music. If licensure in Instrumental Music Education is also desired, then the following courses also need to be completed:

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUED 3130</td>
<td>3</td>
</tr>
<tr>
<td>MUED 3830</td>
<td>1</td>
</tr>
<tr>
<td>MUS 1000 (band/orch. Inst)</td>
<td>3</td>
</tr>
<tr>
<td>MUS 1033/1085/1045</td>
<td>3</td>
</tr>
<tr>
<td>MUS 3230</td>
<td>2</td>
</tr>
<tr>
<td>MUS 1031, 1041, 1051, 1071</td>
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</tr>
<tr>
<td>Total</td>
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</table>

MUSIC PERFORMANCE (MUPE)

EMPHASIS: COMPOSITION

(Leading to the Bachelor of Music Degree)

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNMU 1020 First-Year Connections</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>Any General Education Math</td>
<td>3</td>
</tr>
<tr>
<td>MUS 1000 Private Composition</td>
<td>3</td>
</tr>
<tr>
<td>MUS 1021 Class Voice Instruction I</td>
<td>2</td>
</tr>
<tr>
<td>MUS 1023 Intermediate Class Piano for Music Majors III</td>
<td>1</td>
</tr>
<tr>
<td>MUS 1024 Intermediate Class Piano for Music Majors IV</td>
<td>1</td>
</tr>
<tr>
<td>MUS 1030 Music Appreciation</td>
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Sophomore Year

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Junior Year

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Senior Year

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Tennessee Technological University

Humanities/Fine Arts Elective .................................................. 3
Social/Behavioral Science Elective ........................................... 3
MUS 3710 Pedagogy & Literature I ........................................... 2
MUS 3720 Pedagogy & Literature II ......................................... 2
Applied Music ......................................................................... 2
Major Ensemble ..................................................................... 2

Total ..................................................................................... 26

1 This course not included in 120-hour curriculum.

MUSIC PERFORMANCE (MUPE)

OPTION: INSTRUMENTAL

(Leading to the Bachelor of Music Degree)

Freshman Year

UNMU 1020 First-Year Connections 1 ........................................ 1
ENGL 1010 Writing I .................................................................. 3
ENGL 1020 Writing II .................................................................. 3
Any General Education Math ..................................................... 3
MUS 1021 Class Voice Instruction I .......................................... 1
MUS 1023 Intermediate Class Piano for Music
  Majors III ............................................................................... 1
MUS 1024 Intermediate Class Piano for Music
  Majors IV ............................................................................... 1
MUS 1030 Music Appreciation .................................................. 3
MUS 1070 Concert Choir ......................................................... 1
MUS 1120 Harmony I................................................................. 3
MUS 1130 Aural Techniques I .................................................... 1
MUS 1140 Harmony II ............................................................... 3
MUS 1150 Aural Techniques II ................................................... 1
Social/Behavioral Science Elective ............................................. 3
Applied Music ......................................................................... 4
Major Ensemble ..................................................................... 2

Total ..................................................................................... 34

Sophomore Year

ENGL 2130, 2230, or 2330.......................................................... 3
MUS 1081 Improvisation ......................................................... 1
MUS 1082 Improvisation II ....................................................... 1
MUS 2110 Harmony III ............................................................. 2
MUS 2120 Aural Techniques III ................................................. 1
MUS 2130 Harmony IV............................................................... 2
MUS 2140 Aural Techniques IV ............................................... 1
MUS 4510 Computer Applications in Music ................................ 2
Natural Science Electives ........................................................... 8
Social/Behavioral Science Elective ............................................. 3
SPCH 2410 or PC 2500 .............................................................. 3
Applied Music ......................................................................... 4
Major Ensemble ..................................................................... 2

Total ..................................................................................... 33

Junior Year

HIST 2010 American History I ................................................... 3
MUED 3620 Fundamentals of Conducting and
  Literature .............................................................................. 1
MUED 3630 Instrumental Conducting and
  Literature .............................................................................. 2
MUS 3010 Music History & Literature I .................................... 3
MUS 3020 Music History & Literature II ................................... 3
MUS 3130 Form & Analysis ...................................................... 2
MUS 3210 Instrumentation ....................................................... 2
MUS 3710 Pedagogy & Literature I .......................................... 2
MUS 3720 Pedagogy & Literature II ........................................ 2

1 This course not included in 120-hour curriculum.

MUSIC PERFORMANCE (MUPE)

OPTION: JAZZ

(Leading to the Bachelor of Music Degree)

Freshman Year

UNMU 1020 First-Year Connections 1 ........................................ 1
ENGL 1010 Writing I .................................................................. 3
ENGL 1020 Writing II .................................................................. 3
Any General Education Math ..................................................... 3
MUS 1021 Class Voice Instruction I .......................................... 1
MUS 1023 Intermediate Class Piano for Music
  Majors III ............................................................................... 1
MUS 1024 Intermediate Class Piano for Music
  Majors IV ............................................................................... 1
MUS 1030 Music Appreciation .................................................. 3
MUS 1120 Harmony I................................................................. 3
MUS 1130 Aural Techniques I .................................................... 1
MUS 1140 Harmony II ............................................................... 3
MUS 1150 Aural Techniques II ................................................... 1
Applied Music ......................................................................... 4
Major Ensemble ..................................................................... 2

Total ..................................................................................... 30

Sophomore Year

ENGL 2130, 2230, or 2330.......................................................... 3
MUS 1070 Concert Choir ......................................................... 1
MUS 1081 Improvisation ......................................................... 1
MUS 1082 Improvisation II ....................................................... 1
MUS 2110 Harmony III ............................................................. 2
MUS 2120 Aural Techniques III ................................................. 1
MUS 2130 Harmony IV ............................................................. 2
MUS 2140 Aural Techniques IV ............................................... 1
MUS 4510 Computer Applications in Music ................................ 2
Natural Science Electives ........................................................... 8
SPCH 2410 or PC 2500 .............................................................. 3
Applied Music ......................................................................... 4
Major Ensemble ..................................................................... 2

Total ..................................................................................... 33

2011-12 Undergraduate Catalog

MUS 3950 Junior Recital ......................................................... 1
Applied Music ......................................................................... 4
Minor Ensemble ..................................................................... 2
Major Ensemble ..................................................................... 2

Total ..................................................................................... 29

Senior Year

HIST 2020 American History II ............................................... 3
Humanities/Fine Arts Elective .................................................... 3
MUS 4000 Senior Recital ......................................................... 1
MUS 4120 Contemporary Music ............................................... 2
MUS 4250 Recording Techniques ............................................ 2
MUS 4710 Supervised Teaching Experience I ................................ 2
MUS 4720 Supervised Teaching Experience II ................................ 2
Electives .................................................................................. 2
Applied Music ......................................................................... 4
Minor Ensemble ..................................................................... 2
Major Ensemble ..................................................................... 2

Total ..................................................................................... 25

1 This course not included in 120-hour curriculum.
## Tennessee Technological University

### 2011-12 Undergraduate Catalog

#### Junior Year

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#### Senior Year

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<td>MUS 1016 Accompanying</td>
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#### Freshman Year

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#### Sophomore Year

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### Option: Vocal

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### Option: Piano

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### Notes

1. This course not included in 120-hour curriculum.
Tennessee Technological University

Applied Music .......................................................... 4
Major Ensemble .......................................................... 2
Total ........................................................................... 34

Sophomore Year

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Junior Year

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Senior Year

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1 This course not included in 120-hour curriculum.

NURSING (NURS)

(Leading to the Bachelor of Science in Nursing Degree)

Freshman Year

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<th>Course</th>
<th>sem. hrs.</th>
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<tr>
<td>CHEM 1210 Chemistry for the Life Sciences</td>
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</tr>
<tr>
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2011-12 Undergraduate Catalog

NURS 1020 First Year Connection:
University & Nursing ........................................... 1
Total ........................................................................... 29

Sophomore Year

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<tbody>
<tr>
<td>BIOL 3230 Health Science Microbiology</td>
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<td>BIOL 2020 Human Anatomy &amp; Physiology II</td>
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<tr>
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Junior Year

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<tr>
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<td>NURS 3230 Pharmacological Concepts in Nursing I</td>
<td>2</td>
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<tr>
<td>NURS 3250 Medical Surgical Nursing I</td>
<td>4</td>
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<tr>
<td>NURS 3280 Medical Surgical Nursing I: Lab</td>
<td>3</td>
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<tr>
<td>NURS 3281 Health Assessment &amp; Promotion</td>
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<td>NURS 3361 Medical Surgical Nursing II: Lab</td>
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<td>NURS 3370 Mental Health Nursing</td>
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Senior Year

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<tbody>
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<td>NURS 4101 Nursing Care of Children: Lab</td>
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<td>NURS 4300 Research in Health Care</td>
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<td>NURS 4351 Health of Communities: Lab</td>
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1 This course not included in 120-hour curriculum.

NURSING (NURS)

RN/BSN

(Leading to the Bachelor of Science in Nursing Degree)

Freshman Year

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<td>SPCH 2410 or PC 2500</td>
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<td>Elective</td>
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<td>Semester Hours</td>
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**Sophomore Year**

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**Junior Year**

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<tr>
<td>NURS 3220 Fundamentals of Nursing I</td>
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<td>NURS 3250 Medical Surgical Nursing I</td>
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<td>NURS 3281 Health Assessment &amp; Promotion Practice</td>
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<td>NURS 3465 Bridging to Professional Nursing Practice</td>
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<td>NURS 3370 Mental Health Nursing I</td>
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<tr>
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**Senior Year**

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<td>NURS 4230 Pharmacological Concepts in Nursing II</td>
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<td>NURS 4300 Research in Health Care</td>
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<tr>
<td>NURS 4350 Health Care of Communities</td>
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<tr>
<td>NURS 4351 Health of Communities: Lab</td>
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<tr>
<td>NURS 4450 Leadership &amp; Management</td>
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**PHYSICS (PHYS)**

(Leading to the Bachelor of Science Degree)

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<thead>
<tr>
<th>Course Name</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
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<tr>
<td>ENGL 1020 Writing II</td>
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</tr>
<tr>
<td>CHEM 1110 General Chemistry I</td>
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<td>CHEM 1120 General Chemistry II</td>
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<tr>
<td>CSC 2100 Introduction to Problem Solving and Computer Programming</td>
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<td>CSC 2102 Problem Solving and Computer</td>
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**2011-12 Undergraduate Catalog**

**PHYSICS (PHYS)**

(Leading to the Bachelor of Science Degree)

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<td>MATH 1920 Calculus II</td>
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<td>PHYS 2110, 2111 Calculus-based Physics I</td>
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<td>PHYS 1020 First-Year Connections</td>
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<tr>
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**Sophomore Year**

<table>
<thead>
<tr>
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<tbody>
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</tr>
<tr>
<td>ENGL 2130, 2230, or 2330</td>
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</tr>
<tr>
<td>MATH 2110 Calculus III</td>
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<td>MATH 2120 Differential Equations</td>
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<td>PHYS 2120, 2121 Calculus-based Physics II</td>
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<td>PHYS 2420 Modern Physics</td>
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<tr>
<td>PHYS 2920 Mathematical Physics</td>
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<tr>
<td>PC 2500 Communicating in the Professions</td>
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**Junior Year**

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Semester Hours</th>
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<tbody>
<tr>
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<tr>
<td>PHYS 3810 Quantum Mechanics</td>
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</tr>
<tr>
<td>PHYS 4610 Classical Electricity &amp; Magnetism</td>
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<tr>
<td>PHYS 4620 Classical Electricity &amp; Magnetism</td>
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<tr>
<td>MATH 3470 Introductory Probability &amp; Statistics</td>
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<tr>
<td>MATH 4510 Advanced Mathematics for Engineers</td>
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<td>PHYS 4710 or 4720 I</td>
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**Senior Year**

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<thead>
<tr>
<th>Course Name</th>
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<tr>
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<td>MATH 3810 Complex Variables I</td>
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1 Both PHYS 3120 and 3610 are required and will be offered in alternate years.

2 Required for Option I only.

3 Only one of either PHYS 4710 or 4720 is required for Option II. Both are required for Option I. Students in Option II will select an approved program of at least 14 semester hours in other areas of science or engineering. The number of elective hours is thus reduced to 4 in Option II.

**POLITICAL SCIENCE (POLS)**

(Leading to the Bachelor of Science Degree)

<table>
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<tr>
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<tr>
<td>POLS 1100 Introduction to Political Science</td>
<td>3</td>
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<td>ENGL 1010 Writing I</td>
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### Tennessee Technological University

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<tr>
<td>Natural Science</td>
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#### Sophomore Year

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<td>Humanities/Fine Arts Electives</td>
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<tr>
<td>SPCH 2410 or PC 2500</td>
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<tr>
<td>HIST 2010 American History I</td>
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<td>Natural Science</td>
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#### Junior Year

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<td>HIST Upper Division Elective</td>
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#### Senior Year

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<td>and/or Philosophy Electives</td>
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1. Six hours of foreign language in a sequence or three hours foreign language and three hours of culture and people.

### PSYCHOLOGY (PSY)

(Leading to the Bachelor of Science Degree)

#### Freshman Year

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<tr>
<td>PSY 2010 General Psychology</td>
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<td>BIOL 1010 Introduction to Biology</td>
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<td>BIOL 1020 Introduction to Biology</td>
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<td>MATH 1530 or 1130</td>
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<td>SPCH 2410 or PC 2500</td>
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<tr>
<td>HIST 2010 American History I</td>
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<td>HIST 2020 American History II</td>
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#### Sophomore Year

<table>
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### 2011-12 Undergraduate Catalog

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#### Junior Year

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<td>PSY 4130 Physiological Psychology</td>
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<td>PSY 4150 Psychology of Personality</td>
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#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>PSY 4930 Senior Thesis</td>
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<tr>
<td>PSY 4931 Senior Thesis</td>
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<tr>
<td>PSY 3140, 3150, 3160, or 4140</td>
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<td>PSY Upper-Division Electives</td>
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1. Thirteen elective hours if UNIV 1020 was not taken.

### SECONDARY EDUCATION (SEED)

ENGLISH (SEEN)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with endorsement Grades 7-12)

#### Freshman Year

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<tbody>
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<td>FOED 2011 Introduction to Teaching &amp; Technology</td>
<td>2</td>
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<td>FOED 1820 or 1822</td>
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<td>General Education Math</td>
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<tr>
<td>EDPY 2200 Educational Psychology</td>
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<tr>
<td>ENGL 2230 or 2330</td>
<td>3</td>
</tr>
<tr>
<td>English Electives</td>
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<tr>
<td>HIST 2010 American History I</td>
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<td>HIST 2020 American History II</td>
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#### Junior Year

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<tbody>
<tr>
<td>ENGL 3810 British Literature I</td>
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<tr>
<td>ENGL 3910 American Literature I</td>
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<td>ENGL 3920 American Literature II</td>
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<tr>
<td>ENGL 3250 or any upper-division English writing course</td>
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<tr>
<td>ENGL 4121 Shakespeare</td>
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<tr>
<td>ENGL 4751, 4712, 4713 or ENG 4700</td>
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Tennessee Technological University

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Junior Year

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<td>FOED 3010 Integrating Instructional Technology into the Classroom</td>
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<td>FOED 3080 Field Experiences in Education</td>
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<tr>
<td>FOED 3380 Field Experience in Education</td>
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<tr>
<td>FREN 3020 Oral Communication in French</td>
<td>3</td>
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<tr>
<td>FREN 3110 Survey of French Literature</td>
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<tr>
<td>FREN 3120 Survey of French Literature</td>
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</tr>
<tr>
<td>HIST 1010 Survey of European Civilization</td>
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<td>HIST 1020 Survey of European Civilization</td>
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<tr>
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<tr>
<td>SEED 4125 Materials &amp; Methods of Teaching Foreign Language</td>
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<td>SPED 3000 Teaching Persons with Disabilities in the Regular Classroom</td>
<td>3</td>
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Senior Year

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<tbody>
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<td>EDPY 3300 Evaluation &amp; Guidance</td>
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<tr>
<td>SEED 4870 Student Teaching I</td>
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<td>SEED 4880 Student Teaching II</td>
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<td>SEED 4890 Seminar: Education &amp; Society</td>
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<td>FREN 4920 Senior Capstone</td>
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GERMAN (SEGE)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with endorsement Grades 7-12)

Freshman Year

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<td>ENGL 1020 Writing II</td>
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<tr>
<td>FREN 2010 Transition to Intermediate French</td>
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<td>FREN 2020 Intermediate French</td>
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<td>Science Sequence</td>
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<td>SPCH 2410 Introduction to Speech Communication</td>
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<td>MATH 1010 Introduction to Contemporary Mathematical Ideas</td>
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Sophomore Year

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<tbody>
<tr>
<td>ART 1030 or MUS 1030</td>
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<td>EDPY 2200 Educational Psychology</td>
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<td>ENGL 2130 American Literature</td>
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<td>ENGL 2230 or 2330</td>
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<tr>
<td>FREN 3010 Written Communication in French</td>
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<td>FREN 3510 France: The Country &amp; the People</td>
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<td>FREN 3100 French Phonetics</td>
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<td>FREN 3200 Business French</td>
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<td>HIST 2010 American History I</td>
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<td>HIST 2020 American History II</td>
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<td>EXPW 2430 First Aid, Safety &amp; CPR</td>
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Senior Year

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<tbody>
<tr>
<td>ART 1030 or MUS 1030</td>
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<tr>
<td>EDPY 2200 Educational Psychology</td>
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<td>ENGL 2130 American Literature</td>
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<td>ENGL 2230 or 2330</td>
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<td>GERM 3010 Written Communication in German</td>
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<td>GERM 3020 Oral Communication in German</td>
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<td>GERM 3200 Business German</td>
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<tr>
<td>GERM 3520 Germany: The Country &amp; the People</td>
<td>3</td>
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<td>HIST 2010 American History I</td>
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<tr>
<td>HIST 2020 American History II</td>
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EXPW 2430 First Aid, Safety & CPR ........................................... 2
    Total ........................................................................... 32

Junior Year

    sem. hrs.
    CUED 4150 Middle Level Curriculum .................................. 3
    FOED 3010 Integrating Instructional Technology into the Classroom ........................................... 3
    FOED 3820 Field Experiences in Education ...................... 1
    FOED 3830 Field Experiences in Education ...................... 1
    GERM 3150 Introduction to German Literature .................. 3
    HIST 1010 Survey of European Civilization I .................. 3
    HIST 1020 Survey of European Civilization II ................. 3
    Any upper division German elective ................................ 3
    READ 3350 Teaching Reading in the Content Areas ............ 3
    SEED 4125 Materials & Methods of Teaching Foreign Language ........................................... 3
    SPED 3000 Teaching Persons with Disabilities in the Regular Classroom .................................. 3
    Total ........................................................................... 29

Senior Year

    sem. hrs.
    EDPY 3300 Evaluation & Guidance .................................. 3
    GERM 4910 Directed Studies in German ......... 3
    GERM 4920 Senior Capstone ........................................... 3
    ANTH 1100, GEOG 1120, POLS 1000, PSY 2010, ECON 2010, or SOC 1010 .................. 6
    SEED 4870 Student Teaching II .................................... 5
    SEED 4880 Student Teaching II .................................... 5
    SEED 4890 Seminar: Education & Society ..................... 2
    Electives ...................................................................... 2
    Total ........................................................................... 29

SPANISH (SESP)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with Endorsement Grades 7-12)

Freshman Year

    sem. hrs.
    ENGL 1010 Writing I ..................................................... 3
    ENGL 1020 Writing II .................................................. 3
    FOED 2011 Introduction to Teaching & Technology .......... 2
    FOED 1820 or 1822 .................................................. 1
    MATH 1010 Introduction to Contemporary Mathematical Ideas ........................................... 3
    PHED Activity ............................................................... 1
    Science Sequence ...................................................... 8
    SPAN 2010 Transition to Intermediate Spanish ............ 3
    SPAN 2020 Intermediate Spanish .................................. 3
    SPCH 2410 Introduction to Speech Communication ............ 3
    Total ........................................................................... 30

Sophomore Year

    sem. hrs.
    ART 1030 or MUS 1030 .................................................. 3
    EDPY 2200 Educational Psychology .................................. 3
    ENGL 2130 American Literature .................................. 3
    ENGL 2230 or 2230 .................................................. 3
    EXPW 2430 First Aid, Safety & CPR ............................. 2
    HIST 2010 American History I .................................... 3
    HIST 2020 American History II .................................. 3
    SPAN 3010 Written Communication in Spanish 1 ........... 3
    Total ........................................................................... 32

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    sem. hrs.
    SPAN 3020 Oral Communication in Spanish .................. 3
    SPAN 4020 Introduction to the Literature of Spanish America 3 ........................................... 3
    Total ........................................................................... 29

Junior Year

    sem. hrs.
    CUED 4150 Middle Level Curriculum .................................. 3
    HIST 1010 Survey of European Civilization I ............... 3
    HIST 1020 Survey of European Civilization II ............... 3
    FOED 3010 Integrating Instructional Technology into the Classroom ........................................... 3
    FOED 3820 Field Experiences in Education ...................... 1
    FOED 3830 Field Experiences in Education ...................... 1
    READ 3350 Teaching Reading in the Content Areas ............ 3
    SEED 4125 Materials & Methods of Teaching Foreign Language ........................................... 3
    SPAN 4010 2, 4120 2 and SPAN 3510 or 3550 1 or SPAN upper-division course ....................... 9
    SPED 3000 Teaching Persons with Disabilities in the Regular Classroom .................................. 3
    Total ........................................................................... 32

Senior Year

    sem. hrs.
    EDPY 3300 Evaluation & Guidance .................................. 3
    ANTH 1100, GEOG 1120, POLS 1000, PSY 2010, ECON 2010, or SOC 1010 .................. 6
    SPAN 4110 Culture & Civilization of Spain 3 .................. 3
    SPAN 4920 Senior Capstone ........................................... 3
    SEED 4870 Student Teaching I .................................... 5
    SEED 4880 Student Teaching II .................................... 5
    SEED 4890 Seminar: Education & Society ..................... 2
    Electives ...................................................................... 2
    Total ........................................................................... 29

1 SPAN 3010 is prerequisite to all upper-division Spanish language courses.
2 If SPAN 4010 and 4020 have been previously completed, another upper division Spanish course should be substituted for SPAN 3510 or 3550.
3 SPAN 4010 and 4110 are offered fall term in alternate years. SPAN 4020 and 4120 are offered spring term in alternate years. Choose the course offered that term.
Tennessee Technological University

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MATHMATICS (SEMA)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with endorsement Grades 7-12)

Freshman Year

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<tbody>
<tr>
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<td>ENGL 1020 Writing II</td>
<td>3</td>
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<tr>
<td>FOED 2011 Introduction to Teaching &amp; Technology</td>
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<tr>
<td>MATH 1910 Calculus I</td>
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<td>MATH 1920 Calculus II</td>
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<td>Science Sequence</td>
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<tr>
<td>ART 1030 or MUS 1030</td>
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<tr>
<td>AGBE 2010, ECON 2010, GEOG 1120, GEOG 1130, POLS 1000, PSY 2010, SOC 1010, or SOC (ANTH) 1100</td>
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Sophomore Year

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<tbody>
<tr>
<td>EDPY 2200 Educational Psychology</td>
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<tr>
<td>ENGL 2130 American Literature</td>
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<tr>
<td>ENGL 2230, ENGL 2330, HIST 1310, SPAN 2510 or SPAN 2550</td>
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</tr>
<tr>
<td>HIST 2010 American History I</td>
<td>3</td>
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<tr>
<td>HIST 2020 American History II</td>
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</tr>
<tr>
<td>MATH 2110 Calculus III</td>
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<td>AGBE 2010, ECON 2010, GEOG 1120, GEOG 1130, POLS 1000, PSY 2010, SOC 1010, or SOC (ANTH) 1100</td>
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Junior Year

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<td>MATH 1410 or 1420</td>
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<td>MATH 2010 Elementary Matrix Algebra</td>
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<td>MATH 2120 Differential Equations</td>
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<td>MATH 3070 Statistical Methods I</td>
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<td>MATH 3400 Introduction to Concepts of Mathematics</td>
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<tr>
<td>MATH 3430 College Geometry</td>
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<td>MATH 4610 or 4620</td>
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<td>READ 3350 Teaching Reading in the Content Areas</td>
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<td>SEED 4122 Materials &amp; Methods of Teaching Mathematics</td>
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<td>SEED 4422 Teaching Secondary Mathematics using Technology</td>
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Senior Year

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<td>SEED 4871 Residency I</td>
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<td>SEED 4872 Professional Seminar I</td>
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BIOLOGY (SCBI)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with Endorsement Grades 7-12)

Freshman Year

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<tbody>
<tr>
<td>ENGL 1010 Writing I</td>
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<td>FOED 2011 Introduction to Teaching &amp; Technology</td>
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<td>MATH 1530 Elementary Probability</td>
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<td>BIOL 1110 General Zoology</td>
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<td>BIOL 1120 General Botany</td>
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<td>Social/Behavioral Science Elective</td>
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<td>SPCH 2410 or PC 2500</td>
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<tr>
<td>GEOL 1040 The Dynamic Earth</td>
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Sophomore Year

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<td>Social/Behavioral Science Elective</td>
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<td>CHEM 1110 General Chemistry I</td>
<td>4</td>
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<tr>
<td>CHEM 1120 General Chemistry II</td>
<td>4</td>
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<td>3</td>
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<td>HIST 2020 American History II</td>
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<tr>
<td>EDPY 2200 Educational Psychology</td>
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Junior Year

<table>
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<td>BIOL 2010 Human Anatomy &amp; Physiology I</td>
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<td>BIOL 3130 General Ecology</td>
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<td>BIOL 3810 General Genetics</td>
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<td>EDPY 3300 Evaluation &amp; Guidance</td>
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<td>FOED 3010 Integrating Instructional Technology into the Classroom</td>
<td>3</td>
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<tr>
<td>MATH 1710 Pre-calculus I</td>
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<tr>
<td>MATH 1830 Concepts of Calculus</td>
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Senior Year

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# CHEMISTRY (SCCH)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with Endorsement Grades 7-12)

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<td>CHEM 3410 Quantitative Analysis .......................................</td>
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# EARTH SCIENCE (SCEA)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with Endorsement Grades 7-12)

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### PHYSICS (SCPH)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with Endorsement Grades 7-12)

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<td>EDPY 3300 Evaluation &amp; Guidance</td>
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### ECONOMICS (SSEC)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with Endorsement Grades 7-12)

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<td>ENGL 2230 or 2330</td>
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#### Junior Year

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Tennessee Technological University

GEOGRAPHY (SSGE)

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Sophomore Year | sem. hrs. |
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<tr>
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Junior Year | sem. hrs. |
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<td>HIST 3100 Tennessee Topics</td>
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<tr>
<td>HIST 3410 Introduction to Historical Methods</td>
<td>3</td>
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<td>HIST 4730, 4740, 4750, or 4760</td>
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<tr>
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Senior Year | sem. hrs. |
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2011-12 Undergraduate Catalog

HISTORY (SSHI)

(Leading to Bachelor of Science in Education Degree and the Tennessee Apprentice License, with Endorsement Grades 7-12)

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Sophomore Year | sem. hrs. |
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Junior Year | sem. hrs. |
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<td>Electives</td>
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Senior Year | sem. hrs. |
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<td><strong>GEOG 1120 Human Geography</strong></td>
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<td><strong>THEA 2100 Acting</strong></td>
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<td><strong>THEA 2150 Oral Interpretation of Literature</strong></td>
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<td><strong>THEA 4500 Creative Dramatics</strong></td>
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<td><strong>HIST 3100 Tennessee Topics</strong></td>
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<tr>
<td></td>
<td><strong>HIST 4730, 4740, 4750, or 4760</strong></td>
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1. Those students who do not place at the 2010 level as determined by a proficiency test administered by the Department of Foreign Languages or those students
Tennessee Technological University

who have not taken two years of foreign language in high school will take 1010, 1020, and 2010 for nine hours in the same language.

SOCIOLOGY (SOC)

(Leading to the Bachelor of Science Degree)

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<thead>
<tr>
<th>Freshman Year</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>UNIV 1020 First-Year Connections (^3)</td>
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<tr>
<td>SOC 1010 Introduction to Sociology</td>
<td>3</td>
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<tr>
<td>Humanities/Fine Arts Elective</td>
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<tr>
<td>ENGL 1010 Writing I</td>
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<td>ENGL 1020 Writing II</td>
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<tr>
<td>MATH(^1)</td>
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<td>Foreign Language(^2)</td>
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<td>SOC/SW/CJ elective</td>
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<thead>
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<tr>
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<td>HIST 2020 American History II</td>
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<tr>
<td>SOC 3900 Introduction to Social Research</td>
<td>3</td>
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<tr>
<td>SOC/SW/CJ Elective</td>
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<tr>
<td>Social/Behavioral Science Elective</td>
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<tr>
<td>SPCH 2410 or PC 2500</td>
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<tr>
<td>Elective</td>
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<td>Humanities/Fine Arts Elective</td>
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<tr>
<td>Social Science/Philosophy Elective</td>
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<th>Junior Year</th>
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<tbody>
<tr>
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<td>SOC 3100 Sociological Theory</td>
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<table>
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</table>

\(^1\) Any general education mathematics course. MATH 1010 Introduction to Contemporary Mathematics Ideas recommended.

\(^2\) The minimum is a course in a specific language. None of the “Country and the People” courses are acceptable.

\(^3\) Elective courses are to be selected in consultation with the academic advisor. UNIV 1020 may not be required in some instances. See your academic advisor.

A total of 120 hours is required for graduation with a minimum of 36 hours at the upper level.

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### CRIMINAL JUSTICE CONCENTRATION (SOCJ)

(Leading to the Bachelor of Science Degree in Sociology with a concentration in Criminal Justice)

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<thead>
<tr>
<th>Freshman Year</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>UNIV 1020 First-Year Connections (^3)</td>
<td>1</td>
</tr>
<tr>
<td>SOC 1010 Introduction to Sociology</td>
<td>3</td>
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<tr>
<td>CJ 2700 Introduction to Law Enforcement</td>
<td>3</td>
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<tr>
<td>CJ 2850 Criminal Law &amp; Procedure</td>
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<tr>
<td>ENGL 1010 Writing I</td>
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<td>ENGL 1020 Writing II</td>
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<tr>
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</tr>
<tr>
<td>Foreign Language(^2)</td>
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<td>POLS 1000 American Government</td>
<td>3</td>
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<td>Social Science/Philosophy Elective</td>
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<td>ENGL 2130, 2230, or 2330</td>
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<tr>
<td>HIST 2010 American History I</td>
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<td>HIST 2020 American History II</td>
<td>3</td>
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<tr>
<td>SOC 3900 Introduction to Social Research</td>
<td>3</td>
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<tr>
<td>CJ 3650 Juvenile Delinquency</td>
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<td>SPCH 2410 or PC 2500</td>
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<td>BIOL 1010, 1020, or CHEM 1010, 1020</td>
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<td>PHIL 1030 Introduction to Philosophy</td>
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<thead>
<tr>
<th>Junior Year</th>
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<tbody>
<tr>
<td>SOC 3910 Social Science Statistical Analysis</td>
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<tr>
<td>SOC 3100 Sociological Theory</td>
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<td><strong>Total</strong></td>
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</table>

\(^1\) Any general education mathematics course. MATH 1010 Introduction to Contemporary Mathematics Ideas recommended.

\(^2\) The minimum is a course in a specific language. None of the “Country and the People” courses are acceptable.

\(^3\) Elective courses are to be selected in consultation with the academic advisor. UNIV 1020 may not be required in some instances. See your academic advisor.

A total of 120 hours is required for graduation with a minimum of 36 hours at the upper level.
### SOCIAL WORK CONCENTRATION (SOSW)

(Leading to the Bachelor of Science Degree in Sociology with a concentration in Social Work)

**Freshman Year**

- **UNIV 1020 First-Year Connections**<sup>3</sup> ........................................ 1
- **SOC 1010 Introduction to Sociology** ......................................................... 3
- **SW 1800 Introduction to Social Work** ..................................................... 3
- **ENGL 1010 Writing I** .............................................................................. 3
- **ENGL 1020 Writing II** ............................................................................. 3
- **BIOL 1010 Introduction to Biology I** ....................................................... 4
- **BIOL 1020 Introduction to Biology II** ...................................................... 4
- **MATH<sup>1</sup>** ............................................................................................. 3
- **SOC/SW/CJ Elective** ................................................................................ 3
- **Foreign Language**<sup>2</sup> .................................................................... 3
- **Total** ........................................................................................................ 30

**Sophomore Year**

- **ENGL 2130, 2230, or 2330** ...................................................................... 3
- **HIST 2010 American History I** ................................................................. 3
- **HIST 2020 American History II** ................................................................. 3
- **SOC 3900 Introduction to Social Research** ............................................... 3
- **SOC/SW/CJ Elective** ................................................................................ 3
- **PSY 2010 General Psychology** .................................................................. 3
- **SPCH 2410 or PC 2500** ............................................................................ 3
- **Humanities/Fine Arts Electives** .................................................................. 6
- **Elective** ....................................................................................................... 3
- **Total** ........................................................................................................ 30

**Junior Year**

- **SW 4100 Probation & Parole** ................................................................... 3
- **SOC 3910 Social Science Statistical Analysis** ........................................... 3
- **SOC 3100 Sociological Theory** ................................................................. 3
- **SOC/SW/CJ Electives (upper level)** ............................................................ 6
- **POLS 1000 American Government** ......................................................... 3
- **PSY course** ................................................................................................ 3
- **Electives** ..................................................................................................... 9
- **Total** ........................................................................................................ 30

**Senior Year**

- **SOC 4920 or 4930** .................................................................................. 3
- **SW 4120 Case Management** ..................................................................... 3
- **SW 4900 Internship** .................................................................................. 3
- **PHIL 2250 Introductory Ethics** .................................................................. 3
- **SOC/SW/CJ Elective (upper level)** ............................................................. 3
- **Electives** .................................................................................................... 15
- **Total** ........................................................................................................ 30

<sup>1</sup> Any general education mathematics course. MATH 1010 Introduction to Contemporary Mathematics Ideas recommended.

<sup>2</sup> The minimum is a course in a specific language. None of the “Country and the People” courses are acceptable.

<sup>3</sup> Elective courses are to be selected in consultation with the academic advisor. UNIV 1020 may not be required in some instances. See your academic advisor.

A total of 120 hours is required for graduation with a minimum of 36 hours at the upper level.

### SPECIAL EDUCATION (SPE)

(Leading to the Bachelor of Science Degree and the Tennessee Apprentice License, Grades K-12)

**Freshman Year**

- **BIOL 1310 Concepts of Biology and Environment** .................................. 3
- **CHEM 1310 Concepts of Chemistry** ....................................................... 3
- **ENGL 1010 Writing I** ................................................................................ 3
- **ENGL 1020 Writing II** ............................................................................... 3
- **FOED 2011 Introduction to Teaching & Technology** .................................. 2
- **FOED 1820 or 1822** .................................................................................. 1
- **HIST 2010 American History I** ................................................................. 3
- **HIST 2020 American History II** ................................................................. 3
- **MATH 1410 Survey of Elementary Mathematics I** ................................... 3
- **MATH 1420 Survey of Elementary Mathematics II** ............................... 3
- **ENGL 2130, 2230, or 2330** ................................................................. 3
- **ENGL 2230 or 2330** .................................................................................. 3
- **HEC 2200 Development of Young Children: Conception to Age 9** ........... 3
- **Social/Behavioral Science Elective** ......................................................... 3
- **EDPY 2200 Educational Psychology** ...................................................... 3
- **ELED 2100 or Elective** .............................................................................. 3
- **Total** ........................................................................................................ 30

**Sophomore Year**

- **GEOL 1310 Concepts of Geology** ......................................................... 3
- **PHYS 1310 Concepts of Physics** ............................................................... 3
- **HEC 2060 The Family System** ................................................................. 2
- **ENGL 2130 American Literature** ............................................................. 3
- **ENGL 2230 or 2330** .................................................................................. 3
- **HEC 2200 Development of Young Children: Conception to Age 9** ........... 3
- **Total** ........................................................................................................ 30

**Junior Year**

- **ART 3200 Art Applications I** ................................................................. 3
- **CFS 3600 Family, Community & Professional Partnerships** ...................... 3
- **FOED 3010 Integrating Instructional Technology into the Classroom** .......... 2
- **MUS 1074 Music to Meet Exceptional Education Needs** ......................... 1
- **READ 3311 Literacy I** ............................................................................. 7
- **SPED 3020 Characteristics & Needs of Persons with Comprehensive Disabilities** ................................................................. 3
- **SPED 3031 Physical Management & Support Services for Orthopedic, Motor & Health Impaired** ..................................................... 3
- **SPED 4320 Assessment Procedures in SPED** ......................................... 3
- **SPED 4030 Applied Behavior Analysis for Teachers** ................................ 3
- **SPED 4200 Autism Disorders** ................................................................. 3
- **SPED Electives** ........................................................................................ 8
- **SPCH 2410 or PC 2500** ............................................................................ 3
- **Total** ........................................................................................................ 35

**Senior Year**

- **EXPW 4520 Adapted Physical Activity and Sport** .................................... 3
- **SPED 4871 Residency I** ............................................................................ 5
- **SPED 4880 Professional Seminar I** .......................................................... 5
- **SPED 4880 Residency II** .......................................................................... 10
- **SPED 4882 Professional Seminar II** ....................................................... 2
- **Total** ........................................................................................................ 25

A total of 120 hours is required for graduation with a minimum of 36 hours at the upper level.
### 2011-12 Undergraduate Catalog

#### WEB DESIGN (WEBD)

(Leading to the Bachelor of Science Degree)

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1010 Writing I ..................................</td>
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<td>ENGL 1020 Writing II ................................</td>
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<td>MATH 1730 Pre-calculus Mathematics ................</td>
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<td>ART 1010 Two-Dimensional Design .....................</td>
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<tr>
<td>ECON 2010 Principles of Microeconomics ..............</td>
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<tr>
<td>WEBD 1500 Introduction to Web Design ...............</td>
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<tr>
<td>CSC 2100 Introduction to Problem Solving and Computer Programming</td>
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<td>UNIV 1020 First-Year Connections ....................</td>
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</table>

#### Sophomore Year

| Electives ................................................ | 6 |
| CSC 2110 Data Structures and Algorithms ............ | 3 |
| CSC 2111 Data Structures and Algorithms Lab ....... | 3 |
| DS 2810 Computer Applications in Business .......... | 3 |
| ECON 2020 Principles of Macroeconomics ............. | 3 |
| ENGL 2130, 2230, or 2330 ............................. | 3 |
| HIST 2010 American History I ........................ | 3 |
| HIST 2020 American History II ........................ | 3 |
| Humanities/Fine Arts Elective ....................... | 3 |
| JOUR 2200 Introduction to Mass Communication ...... | 3 |
| PC 2500 Communicating in the Professions .......... | 3 |
| WEBD 2300 Web Site Design: Dynamic Sites ........... | 3 |
| **Total** ................................................ | **31** |

#### Junior Year

| Electives ................................................ | 3 |
| ART 2070 Digital Art Basics .......................... | 2 |
| DS 3810 Business Applications of Microcomputers ... | 3 |
| Humanities/Fine Arts Elective ........................ | 3 |
| JOUR 3460 Introduction to Public Relations .......... | 3 |
| Lab Science ............................................... | 8 |
| WEBD 3500 Web Site Construction/The Rhetoric of Internet Publishing | 3 |
| WEBD 4950 Advanced Web Page Design .................. | 3 |
| **Total** ................................................ | **28** |

#### Senior Year

| Electives ................................................ | 6 |
| CSC 2120 Object-Oriented Programming and Design ... | 3 |
| CSC 2121 Object-Oriented Programming and Design Lab| 1 |
| CSC 4950 Capstone Project ............................ | 3 |
| DS 3841 Management Information Systems ............. | 3 |
| DS 3870 Business Web Applications Development ...... | 3 |
| MKT 3400 Principles of Marketing .................... | 3 |
| SPCH 3120 Visual Communication/Rhetoric ............ | 3 |
| WEBD 4975 Seminar in Web Design .................... | 3 |
| WEBD 4995 Internship in Web Design .................. | 3 |
| **Total** ................................................ | **31** |
Tennessee Technological University

WILDLIFE AND FISHERIES SCIENCE (WFS)

WILDLIFE SCIENCE CONCENTRATION (WFSW)

(Leading to the Bachelor of Science Degree)

**Freshman Year**

- **Biol 1000 Introduction to Biological Methods** .......... 1
- **Biol 1050 Principles of Biology** ......................... 3
- **Biol 1110 General Zoology** ................................. 4
- **Biol 1120 General Botany** .................................. 4
- **Engl 1010 Writing I** ......................................... 3
- **Engl 1020 Writing II** ........................................ 3
- **Chem 1010, 1020 or Chem 1110, 1120** ................. 8
- **Math** 1 .......................................................... 6
- **Total** ................................................................ 32

**Sophomore Year**

- **Engl 2130, 2230, or 2330** ................................. 3
- **Geol 1040 The Dynamic Earth** .......................... 4
- **Geol 2000 Earth Evolution & Life History** .......... 3
- **Hist 2010 American History I** ........................... 3
- **Hist 2020 American History II** .......................... 3
- **Math** 1 .......................................................... 3
- **Humanities/Fine Arts Electives** .......................... 6
- **Pc 2500 Communicating in the Professions** ........ 3
- **Total** ................................................................ 28

**Junior Year**

- **Biol 3240 Field Botany** ...................................... 3
- **Biol 3810 General Genetics** ............................... 4
- **Biol 3920 Biological Communication Skills** .......... 3
- **Wfs 3130 General Ecology** ................................. 4
- **Wfs 3500 Wildlife Law Enforcement** .................. 3
- **Wfs 4740 Wildlife Principles** ............................. 3
- **Science Directed Electives** 2 ............................. 6-8
- **Total** ................................................................ 25-27

**Senior Year**

- **Wfs 4500 National Wildlife Policy** ..................... 3
- **Wfs 4660 Wild Bird Ecology** .............................. 3
- **Wfs 4670 Wild Mammal Ecology** ....................... 3
- **Wfs 4700 Habitat Management** .......................... 3
- **Wfs 4830 Herpetology** ....................................... 3
- **Wfs 4790 Wildlife Techniques** ........................... 6
- **Agt 3450 Dendrology** ....................................... 3
- **Social/Behavioral Science Electives** ..................... 6
- **Electives** ....................................................... 3-5
- **Total** ................................................................ 33-35

1 Required courses are MATH 1130, MATH 3070, and a choice of either MATH 1830 or MATH 3080.
2 Choose two courses from AGRN 2210, BIOL 3530, BIOL 4330, GEOG 4410 or GEOG 4510, WFS 4640, WFS 4711, WFS 4730, or WFS 4810 (only one of the GEOG courses will count toward this requirement).

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2011-12 Undergraduate Catalog

WILDLIFE AND FISHERIES SCIENCE

CONSERVATION BIOLOGY CONCENTRATION (WFSC)

(Leading to the Bachelor of Science Degree)

**Freshman Year**

- **Biol 1000 Introduction to Biological Methods** .......... 1
- **Biol 1050 Principles of Biology** ........................... 3
- **Biol 1110 General Zoology** ................................. 4
- **Biol 1120 General Botany** .................................. 4
- **Engl 1010 Writing I** ......................................... 3
- **Engl 1020 Writing II** ........................................ 3
- **Chem 1010, 1020 or Chem 1110, 1120** ................. 8
- **Math** 1 .......................................................... 6
- **Total** ................................................................ 32

**Sophomore Year**

- **Engl 2130, 2230, or 2330** ................................. 3
- **Geol 1040 The Dynamic Earth** .......................... 4
- **Geol 2000 Earth Evolution & Life History** .......... 3
- **Hist 2010 American History I** ........................... 3
- **Hist 2020 American History II** .......................... 3
- **Math** 1 .......................................................... 3
- **Humanities/Fine Arts Electives** .......................... 6
- **Pc 2500 Communicating in the Professions** ........ 3
- **Total** ................................................................ 28

**Junior Year**

- **Biol 3240 Field Botany** ...................................... 3
- **Biol 3810 General Genetics** ............................... 4
- **Biol 3920 Biological Communication Skills** .......... 3
- **Biol 4330 Plant Ecology** .................................... 3
- **Biol 4610 Invertebrate Zoology** ........................ 3
- **Wfs 3130 General Ecology** ................................. 4
- **Wfs 4500 National Wildlife Policy** ..................... 3
- **Wfs 4740 Wildlife Principles** ............................. 3
- **Science Directed Electives** 2 ............................. 6-10
- **Total** ................................................................ 31-35

**Senior Year**

- **Wfs 4700 Habitat Management** .......................... 3
- **Wfs 4711 Fisheries Management** ....................... 3
- **Wfs 4730 Conservation Biology** ........................ 3
- **Wfs 4630 or 4820** .......................................... 3
- **Wfs 4810 or 4830** .......................................... 3
- **Social/Behavioral Science Electives** ..................... 6
- **Electives** ....................................................... 4-8
- **Total** ................................................................ 25-29

1 Required courses are MATH 1130, MATH 3070, and a choice of either MATH 1830 or MATH 3080.
2 Choose two courses from AGRN 2210, BIOL 3530, BIOL 4320, BIOL 4840, GEOG 4410 or 4510, or WFS 4790 (only one of the GEOG courses will count toward this requirement).
Pre-professional programs are designed to satisfy minimum requirements for admission to professional schools. Some students complete only these minimum course requirements prior to seeking admission to the professional school; some students enroll in degree programs such as biology, chemistry, engineering, physics, or others, and also take courses to complete the minimum professional school requirements because many of the courses satisfy requirements in both programs. In the case of pre-law, there is no specific degree required; therefore, students interested in law usually pursue a bachelor's degree in a field of their interest such as history, political science, or some area of business.

**Program Name**
- Pre-Dental Hygiene .............................................. 2 years
- Pre-Dentistry ................................................................ 3 years
- Pre-Health Information Management .......................... 3 years
- Pre-Medical Technology ........................................... 2 years
- Pre-Medicine .......................................................... 3 years
- Pre-Occupational Therapy ......................................... 2 years
- Pre-Ophthalmology .................................................. 3 years
- Pre-Pharmacy .......................................................... 2 or 3 years
- Pre-Physical Therapy ............................................... 3 years or B.S. degree

**PRE-DENTAL HYGIENE (PDHY)**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>sem. hrs.</th>
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<tbody>
<tr>
<td>BIOL 1110 General Zoology</td>
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<td>CHEM 1010 or CHEM 1110</td>
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<td>CHEM 1020 or CHEM 1120</td>
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<td>ENGL 1010 Writing I</td>
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<td>ENGL 1020 Writing II</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
</tr>
</tbody>
</table>

**Sophomore Year**

| BIOL 2020 Human Anatomy & Physiology II | 4         |
| BIOL 2030 Human Anatomy & Physiology III | 4         |
| BIOL 3230 Health Science Microbiology  | 4         |
| CHEM 2100, 2200, or 2330               | 4         |
| PSY 2010 General Psychology           | 3         |
| ECON 1010 Introduction to Sociology   | 3         |
| Electives                             | 6         |
| Total                                 | 30        |

**Senior Year**

| BIOL 3260 Field Botany                | 3         |
| BIOL 4610 Invertebrate Zoology        | 3         |
| BIOL 4780 Phycology                   | 3         |
| WFS 4760 Fish Culture                 | 3         |
| WFS 4840 Limnology                    | 3         |
| WFS 4740 Wildlife Principles          | 2         |
| Social/Behavioral Science Electives   | 6         |
| Electives                             | 5-9       |
| Total                                 | 29-33     |

1. For students intending to earn a Bachelors degree before entering professional school, it is recommended that elective courses be taken from core requirements or a selected degree program.

**PRE-DENTISTRY (PDEN) AND PRE-MEDICINE (PMED)**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>sem. hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 1110 General Zoology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1120 General Botany</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1110 General Chemistry I</td>
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</tr>
<tr>
<td>CHEM 1120 General Chemistry II</td>
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<tr>
<td>ENGL 1010 Writing I</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
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</table>

**Sophomore Year**

| BIOL 2020 Human Anatomy & Physiology I | 4         |
| BIOL 2021 Human Anatomy & Physiology II | 4         |
| BIOL 3230 Health Science Microbiology | 4         |
| CHEM 2100, 2200, or 2330               | 4         |
| PSY 2010 General Psychology           | 3         |
| SOC 1010 Introduction to Sociology    | 3         |
| Social/Behavioral Science Electives   | 6         |
| Electives                             | 6         |
| Total                                 | 30        |

1. Required courses are MATH 1130, MATH 3070 and a choice of either MATH 1830 or MATH 3080.

2. Choose two courses from AGRN 2210, BIOL 3530, BIOL 4330, GEOG 4410 or 4510, WFS 3500, WFS 4700, WFS 4730, or WFS 4790 (only one of the GEOG courses will count toward this requirement).

**PRE-PROFESSIONAL PROGRAMS**

**FOR DEGREE PROGRAMS - SEE APPLIED CHEMISTRY**

Students who intend to obtain a baccalaureate degree and major in a pre-health science program should see the curriculum for Chemistry, Applied Chemistry Concentration.
Electives (Humanities-3 credit hours)

ENGL 1020 Writing II ................................................. 3
ENGL 1010 Writing I .................................................. 3
UNPP 1020 First-Year Interactions & Advisement ..... 1
Total 32

Sophomore Year

CHEM 3010 Organic Chemistry I ......................... 4
CHEM 3020 Organic Chemistry II ......................... 4
ENGL 2130, 2230, or 2330 ......................... 3
PHYS 2010 Algebra-based Physics I ..................... 4
PHYS 2020 Algebra-based Physics II ..................... 4
Electives (Humanities-3 hours) ............................... 13
Total 28

Junior Year

CHEM 4610 General Biochemistry² ......................... 3
CHEM 4620 General Biochemistry² ......................... 3
Biology Elective .......................................................... 4
Electives 1 ................................................................. 18
Total 28

It is recommended that students have at least 120 semester hours credit or a B.A. or B.S. degree to be competitive for admission.

¹ For students intending to earn a Bachelors degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program. Additional courses in chemistry and biology are suggested.

² Dental School Requirements

PRE-HEALTH INFORMATION MANAGEMENT* (PHIM)

Freshman Year

ENGL 1010 Writing I .................................................. 3
ENGL 1020 Writing II .................................................. 3
MATH 1530 Elementary Probability & Statistics .......... 3
Social/Behavioral Science Electives ........................... 6
Electives 1 ................................................................. 15
UNPP 1020 First-Year Interactions & Advisement ..... 1
Total 31

Sophomore Year

BIOL 2010 Human Anatomy & Physiology I .............. 4
BIOL 2020 Human Anatomy & Physiology II .............. 4
ENGL 2130 American Literature ............................. 3
ENGL 2230 or 2330 ..................................................... 3
Electives (Humanities-3 credits) ............................... 15
Total 29

Junior Year

BMGT 3510 Management & Organization
Behavior ................................................................. 3
Electives 1 ................................................................. 24
Total 27

¹ Suggested electives include ACCT 2110, BMGT 3630, CSC 1100 or DS 2810, and LAW 4720 or core requirements.
Tennessee Technological University

A course in medical terminology is needed for admission into professional school (an on-line course is acceptable.)

1 For students intending to earn a Bachelors degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program.

See the pre-professional advisor for specific requirements for each professional school in Tennessee.

PRE-OPTOMETRY (POPT)

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>sem. hrs.</th>
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</thead>
<tbody>
<tr>
<td>UNPP 1020 First-Year Interactions &amp; Advisement</td>
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<tr>
<td>MATH 1910 Calculus I</td>
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<tr>
<td>CHEM 1110 General Chemistry I</td>
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<td>CHEM 1120 General Chemistry II</td>
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<td>MATH 1730 Pre-calculus Mathematics</td>
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Sophomore Year

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<tr>
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<td>MATH 1530 Elementary Probability &amp; Statistics</td>
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Junior Year

<table>
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<tbody>
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<td>BIOL 2020 Human Anatomy &amp; Physiology II</td>
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<td>BIOL 4040 Immunology</td>
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<td>CHEM 4610 General Biochemistry</td>
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<td>Humanities/Fine Arts Elective</td>
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</table>

1 For students intending to earn a Bachelors degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program.

See the pre-professional advisor for specific requirements for other professional schools.

PRE-PHARMACY (PPHA)

Freshman Year

<table>
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<tr>
<th>Course</th>
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<tbody>
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<td>BIOL 1110 General Zoology</td>
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<td>BIOL 1120 General Botany</td>
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<td>MATH 1530 Elementary Probability &amp; Statistics</td>
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<td>MATH 1910 Calculus I</td>
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Sophomore Year

<table>
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<th>Course</th>
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<tbody>
<tr>
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<td>BIOL 2020 Human Anatomy &amp; Physiology II</td>
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<td>CHEM 1110 General Chemistry I</td>
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Junior Year

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<th>Course</th>
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<tr>
<td>PHYS 2010 Algebra-based Physics I</td>
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<td>PSY 2010 General Psychology</td>
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<td>PSY 3200 Developmental Psychology</td>
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<td>Total</td>
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</tbody>
</table>

1 For students intending to earn a Bachelors degree before entering professional school, it is recommended that elective hours be taken from core requirements or a selected degree program.

See the pre-professional advisor for specific requirements for other professional schools.
Senior Year
Complete the requirements for a B.S. degree in the program of your choosing.

An acceptable GRE score must be attained to be admissible into professional school.

1 It is recommended that elective hours be taken from core requirements or a selected degree program.

2 Suggested courses include anthropology, art history, economics, English literature, fine arts history, language, philosophy, political science or sociology.

3 See the pre-professional advisor for specific requirements for each professional school in Tennessee.
ADPM 0865. Algebra. Lec. 3. Credit 3.
Prerequisite: No ADP math required or prior completion of ADP math or transfer credit in college-level, algebra-based mathematics. Algebraic fractions, absolute value, advanced factoring skills, quadratic equations, systems of equations, and conic sections and functions. Students must earn a grade of C or better to pass ADP/DSP courses. See ADP policies.

The basic structure of geometry stressing proficiency in developing formal proofs, basic constructions and algebraic methods of solving problems. (This course may not be taken for credit in any degree program at TTU.) Students must earn a grade of C or better to pass ADP/DSP courses. See ADP policies.

ADPW 0850. Writing. Lec. 3. Credit 3.
Prerequisite: No ADP writing required or prior completion of ADP writing or transfer credit in college-level English composition. The process of writing, including vocabulary and diction, organization, style, revision, and audience. Emphasis will be placed upon generating paragraphs and essays and the process of literary analysis. Students must earn a grade of C or better to pass ADP/DSP courses. See ADP policies.

DSPM 0800. Elementary Algebra. Lec. 3. Credit 3.
Prerequisite: DSPM 0700 or satisfactory placement test score. Review of operations on signed numbers and linear equations/inequalities, graphing and linear systems, exponents, polynomials, and factoring. Students must earn a grade of C or better to pass ADP/DSP courses. See ADP policies.

Prerequisite: DSPM 0800 or satisfactory placement test score and two high school algebra credits. Operations on rational and radical expressions/equations; systems of equations/inequalities; linear, polynomial and exponential functions; and matrix methods (linear systems). Students must earn a grade of C or better to pass ADP/DSP courses. See ADP policies.

Prerequisite: Satisfactory placement test score and two high school algebra credits, ability to self-pace, and ability to use computer software with confidence. Review of operations with signed numbers. Fundamental concepts of algebra including linear and polynomial functions, rational expressions, radicals, complex numbers, applications, and solutions to systems of equations. Student must earn a grade of C or better to pass ADP/DSP courses. See ADP policies.

DSPR 0800. Developmental Reading. Lec. 3. Credit 3.
Prerequisite: DSPR 0700 or satisfactory placement test score. Facilitates higher-level thinking skills and problem solving in reading. Students must earn a grade of C or better to pass ADP/DSP courses. See ADP policies.
ACCT 3330. Federal Taxation I.  Lec. 3. Credit 3.
Prerequisite: ACCT 3170 with a grade of C. A survey of the
basic concepts of taxation and the impact of federal taxation on
individuals, business income and property transactions.

ACCT 3620. Auditing I.  Lec. 3. Credit 3.
Prerequisite: ACCT 3170 with a grade of C or better.
Introduction to the theory and practice of financial statement
audits.

ACCT 3720. Survey of Accounting.  Lec. 3. Credit 3.
Basic accounting principles, financial statements, cost
behavior, cost accounting systems, and costing for
management decisions. Open to non-business majors only.
Credit will not be granted for both ACCT 2110 or ACCT 2120
and ACCT 3720.

ACCT 4230. Advanced Managerial Accounting.  Lec. 3. Credit 3.
Prerequisite: ACCT 3210. Selected problems in cost
accounting with emphasis on managerial uses of cost
information.

ACCT 4340. Tax Management for Entities.  Lec. 3. Credit 3.
Prerequisite: ACCT 3330. Use of tax law and accounting data
by management in planning, controlling, and decision making
for business entities.

Prerequisite: ACCT 3180 with a grade of C or better. Theory
and problems relating to consolidations and liquidations,
international accounting, governmental accounting and
partnerships.

ACCT 4530. Governmental and Not-For-Profit Accounting.  Lec. 3. Credit 3.
Prerequisite: ACCT 2110 and ACCT 2120 with
minimum grades of C. Accounting, reporting, and budgeting for
governmental entities and other not-for-profit organizations,
including coverage of healthcare and voluntary welfare
organizations.

ACCT 4600. Forensic Accounting and Fraud Accounting.  Lec. 3. Credit 3.
Prerequisite: Junior standing in the accounting major.
Exposure to applicable authoritative literature, as well as to
tools and methods used by modern forensic accountants and
auditors to identify accounting and financial statement frauds.

Prerequisite: ACCT 3620. Audit concepts and practices applied
to accounting information systems in a microcomputer
environment.

ACCT 4800. Internship in Accounting.  Lec. 3. Credit 3.
Prerequisite: Consent of Department Internship Coordinator or
Department Chairperson and, if for graduate credit, consent of
MBA Director. A directed current professional experience in
accounting. Graduate credit requires a field research project.

ACCT 4900. Special Topics.  Lec. 3. Credit 3.
Prerequisite: Consent of Instructor and Department
Chairperson. An advanced course concerning current topics in
Accounting, Auditing, Taxation, and Business Law. Course
may be taken more than once as topics change.

Agribusiness Economics (AGBE)

(O) and (E) Denote Odd and Even Years Respectively

AGBE 1120. Introduction to Agritourism.  Lec. 3. Credit 3.
Agritourism has become a tool that has a direct economic
impact on farms and surrounding communities. As Middle
Tennessee and the Cumberland Region continue to embrace
tourism with the desire to maintain traditional lifestyles, this
course will delve into ways to blend the best of agriculture,
their heritage and the tourism industry. This course will lay the
ground work for the Agritourism concentration. Open both to
majors and non majors.

Food production and distribution for the advancement of
societies in developed and developing countries.

AGBE 2100. Economics of Agriculture.--Fall, Spring.
Lec. 3. Credit 3.
Economic principles as they relate to agriculture, and the place
of agriculture and agribusiness in the national economy.

AGBE 3020. Agriculture and Heritage Based Tourism.  Lec. 3. Credit 3.
In order to understand the connection between agricultural
traditions and heritage based tourism, one must understand
the importance of resource strategies critical to the
preservation and conservation of unique environmental and
historical settings. This course will review the historical image
of agriculturists and their connection to the land and how this
connection ties to heritage based tourism. The course will delve
into a variety of topics and methods to increase the
importance of this new role awareness.

AGBE 3110. Agricultural Marketing and Futures.-- Fall.
Lec. 3. Credit 3.
Institutions involved in marketing agricultural products and the
use of futures and hedging.

Credit 3.
Prerequisite: AGBE 2100. Principles of price determination,
price indexes and their use, parity price, and tools of price
analysis.

AGBE 3400. Agricultural Finance.--Spring.
Lec. 3. Credit 3.
Prerequisite: ACCT 2110. Financial statements and analyses
for farms and agribusiness firms, time value of money, capital
and credit requirements and sources.

AGBE 4030. Agribusiness Management.--Spring.
Lec. 3. Credit 3.
Economics and business principles applied to farm
management, resources allocation, budgeting, and records.

AGBE 4120 (5120). Environmental and Natural Resource Economics.--Fall. Lec. 3. Credit 3. Prerequisite: AGBE 2100 and ECON 2010. Issues and policies involving pollution, depletable and renewable resources and sustainable development. Students who have not had prerequisites can request permission from the instructor.

AGBE 4130. Agricultural Policy.--Spring. (E). Lec. 3. Credit 3. Prerequisite: Senior standing. Rural and urban values, farm problems, relationship of agriculture to public policy, policy vs. programs, and appraisal of program results.

AGBE 4210 (5210). Agricultural and Biological Statistics.--Fall. Lec. 3. Credit 3. Sampling, probability, distributions, statistical tests, analysis of variance, regression, and interpretation of data.

AGBE 4940, 4950, 4960, 4970, 4980 (5940-5950). Agribusiness Economics Topics. Credit 1-4. Prerequisite: Consent of instructor. Special study in an approved area of agribusiness economics under the supervision of a member of the School of Agriculture faculty.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Agricultural Communications (AGCM)

AGCM 4850-4860. Internship in Agricultural Communications. Credit 4. Prerequisite: Senior standing in Agricultural Communications. Supervised internship in an educational, Extension, or agricultural business/agency involving agricultural communications and related fields.

Agricultural Education (AGED)

(O) and (E) Denote Odd and Even Years Respectively

AGED 2120. Introduction to Agricultural and Extension Education. Lec. 2. Lab. 2. Credit 3. History, philosophy, goals, objectives and current issues in agricultural and extension programs. Early field experience in a high school Agricultural Education program or a County Agricultural Extension Service program.

AGED 3010. Professional Leadership Development. Lec. 2. Lab. 2. Credit 3. Leadership styles and roles and their implications for agricultural professionals; developing leadership, communication and interpersonal skills; planning and conducting effective meetings.

AGED 4110. Methods of Teaching Agriscience. Lec. 2. Lab. 2. Credit 3. Planning, implementing and evaluating the high school Agriscience course offered for science credit; course and lesson planning; laboratory facilities and equipment; and instructional methods and techniques for agriscience.

AGED 4150 (5150). Communications and Public Relations in Agricultural and Extension Education. Lec. 3. Credit 3. Publics to be dealt with, public relations media, techniques of establishing and maintaining desirable communications, and public relations in agriculture.

AGED 4200 (5200). Methods and Techniques of Teaching in Agricultural and Extension Education. Lec. 2. Lab. 2. Credit 3. Theory and practice in directing learning activities; planning and delivering instruction to formal and informal groups in Agricultural and Extension Education; preparing instructional materials; and using instructional technology.

AGED 4250 (5250). Use of Volunteers in Agricultural and Extension Education. Lec. 3. Credit 3. Developing skills in selecting, recruiting, training, coordinating, supervising, and evaluating volunteers in Agricultural and Extension Education.

AGED 4300 (5300). Development of Youth Programs in Agricultural and Extension Education. Lec. 3. Credit 3. Developing, implementing and evaluating the 4-H and FFA youth programs in Agricultural and Extension Education; identifying needs and interests of youth; and identifying, securing, and developing supportive resources.

AGED 4350 (5350). Program Planning and Evaluation in Agricultural and Extension Education. Lec. 3. Credit 3. Advanced principles and procedures used in planning and evaluating Agricultural and Extension Education programs.

AGED 4850-4860. Internship. Credit 4.* Prerequisite: Senior standing. Supervised internship in an educational, extension, or agricultural business/agency involving agricultural communications and related fields.

AGED 4870. Student Teaching in Agricultural Education I. Credit 5. Prerequisite: full admission to Teacher Education Program; senior classification. Corequisite: AGED 4880, AGED 4890. Application for student teaching should be made at least two semesters in advance, excluding the summer term. All activities directly related to teaching performance, such as planning and presenting lessons, directing study, and managing the classroom.

AGED 4871. Residency I. Credit 5. Corequisite: AGED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

AGED 4872. Professional Seminar I. Credit 5. Corequisite: AGED 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.
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AGED 4880. Student Teaching in Agricultural Education II. Credit 5.
Corequisite: AGED 4870, AGED 4890. Non-instructional aspects of teaching, such as personal-professional characteristics, human relations skills, and educational philosophy.

AGED 4881. Residency II. Credit 10.
Corequisite: AGED 4882. Performance-based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

AGED 4882. Professional Seminar II. Credit 2.
Corequisite: AGED 4881. Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

Corequisite: AGED 4870, AGED 4880. Seminar on issues related to the interrelationships among school, culture and society; a historical, philosophical, and sociological analysis.

Prerequisite: Consent of instructor. Special study in an approved area of agricultural education under the supervision of a member of the School of Agriculture faculty.

* No more than a total of 12 credits of Work Experience, Internship, and/or Co-op or any combination of these may apply toward the Bachelor of Science degree in Agriculture.

Agricultural Engineering Technology (AGET)

(O) and (E) Denote Odd and Even Years Respectively

AGED 2110. Agricultural Engineering Technology.--Fall. (E). Lec. 2. Lab 2. Credit 3.
Application of engineering principles to agriculture through a selection of independent but related topics while also advancing the students problem solving skills.

Lec. 2. Lab. 2. Credit 3.
Application of engineering principles to surveying, soil and water conservation and animal waste management.

AGED 3320. Small Power Equipment.--Spring. (O).
Lec. 2. Lab. 2. Credit 3.
Principles of operation, adjustment and maintenance of small internal combustion engines and associated equipment.

AGED 3510. Agricultural Surveying.
Lec. 2. Lab. 3. Credit 3.
Elementary surveying including use of the steel tape, level and transit with practice in traversing, and leveling and area computations.

AGED 3560. Turf Systems Irrigation Design.--Summer and Fall (E).
Lec. 2. Lab 2. Credit 3.
Irrigation system design for turf-based systems including residential lawns, commercial properties, athletic fields, and golf courses. Irrigation scheduling and water demand are presented to provide management capabilities.

AGED 3620. Computer Aided Design in Agriculture.-- Summer and Fall (O).
Lec. 1. Lab. 4. Credit 3.
Prerequisite: AGET 2110 or consent of instructor. The principles of computer aided drafting and design with emphasis on agricultural operations.

AGED 4220 (5220). Agricultural Machinery and Tractors.--Spring. (E).
Lec. 2. Lab. 2. Credit 3.
Principles of operation, selection, and economic utilization of agricultural power units and equipment.

Selection, design, construction, and operation of greenhouse structures and related nursery and landscaping equipment.

Lec. 2. Lab. 2. Credit 3.
Planning; drawing; materials; principles of construction with respect to arrangement, location, and environmental control; and plan reading.

AGED 4720 (5720). Agricultural Processing.--Spring (O).
Lec. 3. Credit 3.
Managing value-added agricultural products through the application of engineering principles to fluid flow, electrical controls, refrigeration, heat transfer, drying, and hydraulic systems.

Prerequisite: Consent of instructor. Special study in an approved area of agricultural engineering technology under the supervision of a member of the School of Agriculture faculty.

Horticulture (AGHT)

(O) and (E) Denote Odd and Even Years Respectively

AGHT 3030. Integrated Pest Management.--Spring. (O).
Lec. 2. Lab. 2. Credit 3.

Basic training and experience in professional tree care and aerial tree work. Climbing equipment provided, students provide personal protective equipment after instruction.

AGHT 3400. Landscape Horticulture.--Fall. Lec. 2. Lab. 2. Credit 3.
Prerequisite: AGRN 1010 or consent of instructor. Basic
theory and principles of design for landscaping modern homes and businesses. Use of ornamental plants and special features. Installation, maintenance, and discussion of the effect of management on plant growth and health. Topics include pruning, fertilizer application, pest control, etc.

AGHT 3410. Plant Propagation.--Fall. Lec. 2. Lab. 2. Credit 3.
Prerequisite: AGRN 1010, BIOL 1120, or consent of instructor. Asexual and sexual propagation of plants by cuttings, layers, division, special structures, grafting, budding, seeds, and tissue culture.

AGHT 3440. Floral Arrangement.--Fall. Lec. 1. Lab. 4. Credit 3.
Fundamentals and theory of floral design with emphasis on arrangements for the home and special occasions.

AGHT 3450. Dendrology.--Fall. Lec. 2. Lab. 3. Credit 3.
Prerequisite: BIOL 1120 or consent of instructor. The study of trees and the identification of native and urban species commonly found in the mid-South. Adaptability of the species to various ecological conditions of forest ecosystems and landscape environments will be discussed.

Identification, culture, production, and use of foliage plants in interior design; principles of design; and practices of maintenance.

Uses and the identification of tree, shrub, and herbaceous plant species for landscapes. Ornamental characteristics and the adaptability of the species to various landscape conditions will be discussed.

AGHT 3480 (SPED 3480). Horticultural Therapy.--Spring. (O). Lec. 2. Lab. 2. Credit 3.
Introduction to the application of horticulture for special education and as therapy for treatment, rehabilitation, and/or training of individuals with disabilities.

Prerequisite: AGHT 3410. Principles of retail and wholesale nursery site selection, field and container production, and resource management. Students who have not had prerequisite can request permission from the instructor.

Prerequisite: AGHT 3410, AGET 4610 (5610), or request by advisor. Principles of greenhouse management and environmental controls; production, timing, harvesting, and marketing of commercial floricultural crops; pest control strategies; and nutrient film technique. Development of commercial production schedule required.
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* No more than a total of 12 credits of Work Experience, Internship, and/or Co-op or any combination of these may apply toward the Bachelor of Science degree in Agriculture.

Agronomy (AGRN)

(O) and (E) Denote Odd and Even Years Respectively

AGRN 1100. Plant Science.--Fall, Spring. Lec. 3. Credit 3.

Introduction to the fundamentals of plant science as related to the ecological principles of agronomic and horticultural crops.

AGRN 1110. Plant Science Laboratory. Lab. 2. Credit 1.

Corequisite: AGRN 1100 unless credit for AGRN 1100 has previously been earned.

AGRN 2210. Soils.--Fall, Spring. Lec. 2. Lab. 2. Credit 3.

Prerequisite: CHEM 1020 or consent of instructor. An introduction to the properties of soils, soil survey, soil fertility, and soil management.

AGRN 2240. Introduction to Soil Evaluation.--Fall. Lab. 2. Credit 1.

For students interested in becoming members of the intercollegiate soil judging team.


Prerequisite: AGRN 1100 and AGRN 1110. Botany and classification, importance, cultural practices (including tillage systems), pest control, crop improvement, harvesting, and uses of the principal crops of Tennessee and the United States. Agroecosystem concepts will be emphasized.

AGRN 3100. Turfgrass Management.--Fall. (E). Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100 and AGRN 1110 or consent of instructor. Establishment and management of special purpose grasses for lawns, golf courses, parks, playgrounds, athletic fields, and roadsides.


An examination of organic crop production methods including improving the structure of soil and fertility, pest management, irrigation, season extension, vegetable and fruit crop production, harvesting, post harvest handling and marketing techniques.

AGRN 4100 (5100). Weed Science.--Fall. (O). Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100 and AGRN 1110 or consent of instructor. Plant and seed identification, and growth habits and dissemination of weeds. Biological, cultural, and chemical methods of control in the integrated pest management (IPM)

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Prerequisite: AGRN 1100, AGRN 1110 and AGRN 2210. Botany and classification, soil and climatic requirements, species adaptation, establishment and management of grasses and legumes for silage, hay, and temporary, permanent, and rotational pastures for ruminants, swine, and horses.

AGRN 4120 (5120). Crop Improvement. Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 1100 and AGRN 1110 or consent of instructor. Objectives, genetic principles, and methods of crop improvement by conventional and genetic engineering methods.


Prerequisite: AGRN 2210 or consent of instructor. Properties of soils in relation to plant nutrition, and fertilizer materials and their relationship to soil fertility.

AGRN 4220 (5220). Environmental Soil Chemistry. Lec. 3. Credit 3.

Prerequisite: AGRN 2210 or consent of instructor. Study of chemical composition of natural and anthropogenic material in soil and their reactions and movement in the soil environment.

AGRN 4230 (5230). Soil Classification.--Fall. Lec. 2. Lab. 2. Credit 3.

Prerequisite: AGRN 2210 or consent of instructor. Soil formation, morphology, and classification, and methods of soil survey and detailed mapping of an assigned area.


Prerequisite: AGRN 2240. For members of the intercollegiate soil judging team.


Prerequisite: Consent of instructor. Special study in an approved area of agronomy under the supervision of a member of the School of Agriculture faculty.


Prerequisite: Consent of instructor. Special study in an approved area of soil science under the supervision of a member of the School of Agriculture faculty.

Animal Science (ANS)

(O) and (E) Denote Odd and Even Years Respectively

ANS 1200. Introductory Animal Science.--Fall, Spring. Lec. 3. Credit 3.

Introduction to market classes, types, grades, and breeds of livestock and poultry; animal agricultural products; basic animal biological processes as related to livestock production and
management; and overview of careers related to animal agriculture.

**ANS 1210. Introductory Animal Science Laboratory.**  
Lab. 3. Credit 1.  
Corequisite: ANS 1200 unless credit for ANS 1200 has previously been earned. Provides the opportunity for application of the basic principles of animal science with an emphasis on different types of livestock enterprises; animal types, breeds, form, and function; and common practices employed in management of major livestock enterprises.

Lec. 1. Lab. 4. Credit 3.  
Prerequisite: ANS 1200 and ANS 1210. Management techniques, practices and principles involved in meat animal production.

**ANS 2110. Livestock Evaluation.** --Fall.  
Lec. 1. Lab. 4. Credit 3.  

**ANS 2250. Animals and Society.** Lec. 3. Credit 3.  
Impacts of animals, and particularly companion animals, on human society, development, health and behavior.

**ANS 3010. Animal Nutrition.** --Fall.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: ANS 1200, ANS 1210, CHEM 1010 and CHEM 1020. Classes of nutrients, digestibility, metabolism, nutrient requirements of livestock, and feed analysis.

**ANS 3020. Feeds and Feeding.** --Spring.  
Lec. 2. Lab. 2. Credit 3.  
Feed classification, nutrient requirements, ration formulation for various classes of livestock and dairy and conducting feeding trials.

**ANS 3110. Livestock Judging.** --Spring. (O).  
Lec. 1. Lab. 4. Credit 3.  
Prerequisite: ANS 2110. Designed to train the student to become a competent judge of market and breeding classes of beef cattle, sheep, and swine.

**ANS 3130. Animal Breeding.** --Fall.  
Lec. 2. Lab. 2. Credit 3.  
Genetics applied to the selection and improvement of livestock, heritability estimates, and selection indexes as applied to animal breeding.

**ANS 3140. Reproduction in Farm Animals.** --Spring.  
Lec. 2. Lab. 2. Credit 3.  
Reproduction in farm animals; anatomy, physiology, and endocrine control on reproduction; and applied reproduction methods in livestock and dairy animals.

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**ANS 3150. Common Diseases and Parasites of Domestic Animals.** --Spring. Lec. 3. Credit 3.  
Prevention, diagnosis, and treatment of common diseases and parasites affecting farm animals.

**ANS 3310. Meat, Dairy, and Poultry Products.**  
Lec. 2. Lab. 2. Credit 3.  
Food science applied principles regarding meat, dairy, and poultry products. Emphasis on food safety, quality, and marketing issues.

**ANS 3330. Dairy Cattle Selection and Breeding.**  
Lec. 1. Lab. 4. Credit 3.  
Judging and selection of dairy cattle according to type and production, classification systems, and performance estimates.

**ANS 4110. Beef Production and Management.** --Fall. (O).  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: ANS 3010 or ANS 3020 or consent of instructor. Application of modern technology in breeding, feeding, financing, management, and marketing of beef cattle.

**ANS 4120. Swine Production and Management.** --Fall. (E).  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: ANS 3010 or ANS 3020 or consent of instructor. Application of modern technology in breeding, feeding, financing, management, and marketing of swine.

**ANS 4130. Sheep Production and Management.** --Spring. (O).  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: ANS 3010 or ANS 3020 or consent of instructor. Breeds, feeding, management, marketing of sheep for lamb and wool production, and parasite and disease control.

**ANS 4140. Commercial Poultry Production and Management.** Lec. 3. Credit 3.  
Nutrition, reproduction, and management of poultry.

**ANS 4150. Equine Management.** --Fall. (O).  
Lec. 2. Lab. 2. Credit 3.  
Overview of the equine industry, breeds, selection, handling and grooming, foot care, diseases, nutrition, reproduction, facilities, and management techniques.

**ANS 4310. Dairy Herd Management and Supervision.** --Spring. (E).  
Lec. 2. Lab. 2. Credit 3.  
Selection, feeding, management, supervision methods, DHIA record keeping, disease control, equipment selection, and quality control methods in dairy production.

**ANS 4940, 4950, 4960, 4970, 4980 (5940, 5950). Animal Science Topics.** Credit 1-4.  
Prerequisite: Consent of instructor. Special study in an approved area of animal science under the supervision of a member of the School of Agriculture faculty.

**Anthropology (ANTH)**

◆ **ANTH (SOC) 1100. Introduction to Anthropology.** Lec. 3. Credit 3.  
Overview of the physical and cultural development of human beings from prehistoric times to the present.
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**ANTH 2002. Non-Western Cultures.** Lec. 3. Credit 3.
An introduction to the study of non-Western cultures and societies through their ideologies, language systems, ecologies, family structures, social stratification, religions, and economic structures. A comparative approach will be emphasized.

**ANTH (SOC) 2100. Cultural Ecology.** Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor.
Interaction between human cultural systems and the physical environment in prehistoric through modern times.

**ANTH (CJ) (SOC) 4040 (5040). Law and Culture.** Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor.
A comparative cross-cultural analysis of primitive, traditional, and modem attitudes toward law, social control, punishment, and individual responsibility.

**ANTH 4910 (5910). Independent Study.** Credit 1-3.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of anthropology where there is no appropriate course. May be taken twice, provided that the topic is different.

**ANTH 4960 (5960). Special Topics.** Credit 3.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue or interest area in anthropology.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

**Art Education (ARED)**


**ARED 3155. Elementary Practicum.** Lab. 1. Credit 1.
Prerequisite: ARED 2020 and ART 3200. Corequisite: ART 3205.
This practicum is to prepare art education students for their Residency I and II requirements in the senior year.
Students will be required to spend at least 20 hours in a public school elementary art environment.

Prerequisite: ARED 2020, ARED 3155, ART 3200 and ART 3205.
This practicum is to prepare art education students for their Residency I and II requirements in the senior year.
Students will be required to spend at least 20 hours in a public school secondary art environment.

Prerequisite: Admission to the Teacher Education Program, ARED 2020 and ART 3200.
Materials and methods of teaching art in Grades 7-12.

**ARED 3220. Teaching Art Appreciation in the Schools.** Lab. 1. Field Exp. 1. Credit 2.
Prerequisite: ART 3200, ARED 2020, and ARED 3210.
The prerequisite to all upper division education courses is full admission to the teacher education program.
Methods of teaching art appreciation in the public schools, Grades K-12.

**ARED 3800. Field Experiences in Education.** Credit 2.
Prerequisite: The prerequisite to all upper division education courses is full admission to the teacher education program.
Corequisite: ART 3200.
Supervised experiences in the public schools introducing program planning on elementary and secondary levels.

**ARED 3810. Field Experiences in Education.** Credit 2.
Prerequisite: The prerequisite to all upper division education courses is full admission to the teacher education program.
Corequisite: ART 3210 and ARED 3220.
Supervised experiences in the public schools introducing program planning on elementary and secondary levels.

**ARED 4870. Student Teaching I.** Credit 5.
Prerequisite: The prerequisite to all upper division education courses is full admission to the teacher education program.
Corequisite: ARED 4880, ARED 4890.
Activities directly related to teaching performance, planning and presenting lessons, directing study, and managing the classroom.

**ARED 4871. Residency I.** Credit 5.
Corequisite: ARED 4872.
Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

**ARED 4872. Professional Seminar I.** Credit 5.
Corequisite: ARED 4871.
Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

**ARED 4880. Student Teaching II.** Credit 5.
Prerequisite: The prerequisite to all upper division education courses is full admission to the teacher education program.
Corequisite: ARED 4870, ARED 4890.
Continuation of ARED 4870 in a different setting.

**ARED 4881. Residency II.** Credit 10.
Corequisite: ARED 4882.
Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

**ARED 4882. Professional Seminar II.** Credit 2.
Corequisite: ARED 4881.
Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.
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**ARED 4890. Seminar: Education and Society.** Credit 2. Prerequisite: The prerequisite to all upper division education courses is full admission to the teacher education program. Corequisite: ARED 4870, ARED 4880. Seminar on the interrelationships among school, culture and society; a historical, philosophical and sociological analysis.

**Art (ART)**

**ART 1010. Two-Dimensional Design.** Studio 6. Credit 3. Introduction to the elements and principles of design in two-dimensions through studio projects, lectures, demonstrations and discussion.

**ART 1030. Art Appreciation.** Credit 3. Introduction to the understanding and appreciation of art. Emphasis on language of art, its application, and experiencing various art forms.

**ART 2010. Three-Dimensional Design.** Studio 6. Credit 3. Introduction to the elements and principles of design in three-dimensions through studio projects, lectures, demonstrations, and discussion.

**ART 2040. Printmaking: Relief.** Studio 4. Credit 2. Prerequisite: ART 2310 and ART 1010 or consent of the instructor. Introduction to relief printmaking techniques with concentrated work in the processes of wood cut and linoleum cut.

**ART 2060. 35mm Photography.** Studio 4. Credit 2. Introduction to 35mm camera operation, black and white darkroom techniques, and color slide exposure.

**ART 2070. Digital Art Basics.** Studio 4. Credit 2. Prerequisite: ART 1010 or permission of instructor. Basic principles and techniques for the artist of input, output, and manipulation of images on the computer. Emphasis on the use of Adobe Photoshop.

**ART 2080. Special Problems in Printmaking.** Studio 2. Credit 1. Prerequisite: ART 2310 or consent of instructor. Corequisite: ART 2040. Required for BFA majors with concentrations in Painting. Special studies in printmaking, which emphasize skills and artistic development of the professional artist.

**ART 2090. Special Problems in Photography.** Studio 2. Credit 1. Corequisite: ART 2060. 35mm Photography. Required for BFA majors with Painting concentrations. Special studies in photography, which emphasize skills and artistic development for the professional artist.

**ART 2110. Art History I.** Lec. 3. Credit 3. Survey of painting, sculpture, and architecture from prehistoric through medieval.

**ART 2120. Art History II.** Lec. 3. Credit 3. Survey of painting, sculpture, and architecture from Renaissance through the nineteenth century.

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**ART 2310. Drawing I, Introduction.** Studio 6. Credit 3. Introduction to techniques and media of drawing, including two-dimensional and illusionistic skills.

**ART 2320. Drawing II.** Studio 6. Credit 3. Prerequisite: ART 2310 or consent of the instructor. Refinements of basic techniques with emphasis on individual development.

**ART 2330. Technical Drawing.** Studio 6. Credit 3. This class will focus on graphic techniques that are used in solving design problems, visually communicating ideas, and documenting precise information by drawing both with instruments and freehand.

**ART 2410. Painting I, Introduction.** Studio 6. Credit 3. Prerequisite: ART 1010, ART 2310, or permission of the instructor. Introduction to techniques, media, pictorial devices, and color theory.

**ART 2510. Introduction to Clay.** Studio 6. Credit 3. Introduction to hand-built and wheel-thrown clay vessels and sculpture, including historical and contemporary overview.

**ART 2610. Introduction to Fibers.** Studio 6. Credit 3. Introduction to the basics of surface design (dyeing and pattern making) and weaving cloth on a floor loom. Emphasis on developing the understanding of safe and successful methods of weaving cloth and pattern making.

**ART 2710. Introduction to Glass.** Studio 6. Credit 3. Beginning glass blowing for both majors and non-majors. Vessels and paperweights made at the furnace and coldworking techniques such as stained glass, sandblasting, grinding, and polishing. Modern use of glass and basics of the history of glass will also be covered.


**ART 2910. Introduction to Woodworking.** Studio 6. Credit 3. Introduction to the basics of woodworking design and technology using hand and power tools.

**ART 3130. Twentieth-Century Art.** Lec. 3. Credit 3. Prerequisite: ART 2120 or consent of instructor. A study of the major art movements of the twentieth century.

**ART 3150. History of Crafts I.** Lec. 3. Credit 3. Prerequisite: Consent of the instructor. Survey of prehistoric through ancient crafts and the crafts of India, China, Japan, Africa, Native America and Islam.

**ART 3160. History of Crafts II.** Lec. 3. Credit 3. Prerequisite: ART 3150 or consent of the instructor. Survey of crafts from the Medieval Period through the present.

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Prerequisite: ARED 2020 and ART 3200. The course is structured to provide art education majors with opportunities to constructively develop and apply their knowledge and skills in the theory and practice of teaching the visual arts. This holistic-arts educational methods course emphasizes the integration of the visual arts media within cross-disciplines to be practiced in the public/private section of learning institutions.

Prerequisite: ART 2320 or consent of instructor. Refinement of basic techniques with emphasis on individual development.

ART 3320. Figure Studies. Studio 6. Credit 3.
Prerequisite: ART 2320 or consent of instructor. Specific concepts in drawing and/or painting the human form, including gesture and expression, spatial structure and proportion, and the effects of light and drapery on the human form.

Prerequisite: ART 2410 or consent of instructor. Emphasis on problems in painting and use of materials in expressing the student's ideas.

Prerequisite: ART 2010, ART 2320, or ART 3410 or consent of instructor. A continuation of studio painting with emphasis on more advanced techniques, content, and the emergence of individual styles. May be repeated up to 6 credit hours.

Prerequisite: ART 3420 or consent of instructor. A continuation of studio painting with emphasis on more advanced techniques, content, and the emergence of individual styles. May be repeated up to 6 credit hours.

Prerequisite: ART 3421 or consent of instructor. Directed study in painting arranged between the instructor and student.

Prerequisite: ART 3430 or consent of instructor. Directed study in painting arranged between the instructor and student.

Prerequisite: ART 1010, ART 2310, ART 2510 or permission of instructor. Exploration of wheel-throwing with emphasis on decorating and firing, including historical and contemporary overview. May be repeated up to 12 credit hours.

Prerequisite: ART 1010, ART 2310, ART 2510 or permission of instructor. Further exploration of hand-building with emphasis on decorating and firing. May be repeated up to 12 credit hours.

Prerequisite: ART 2010, ART 2320 or ART 2330 and ART 3510 or ART 3511, or permission of instructor. Advanced ceramic form and process with emphasis on individual stylistic concept. Additional emphasis on ceramic history, aesthetics, and criticism. May be repeated up to 12 credit hours.

Prerequisite: ART 2010, ART 2320 or ART 2330 and ART 3510 or ART 3511 or permission of instructor. Advanced ceramic form and process with emphasis on individual stylistic concept. May be repeated up to 12 credit hours.

Prerequisite: ART 2510 or equivalent and permission of instructor. Independent production studies by arrangement with the instructor, emphasis on advanced creative design and skills. May be repeated up to 12 credit hours.

Prerequisite: ART 2510 or equivalent and permission of instructor. Independent production studies by arrangement with the instructor, emphasis on advanced creative design and skills. May be repeated up to 12 credit hours.

Prerequisite: ART 1010, ART 2310, ART 2610 or permission of instructor. Focus is on strengthening the student's technical knowledge and design capabilities of woven fiber structures, mainly for wearables and home furnishings. Explore various yarns to create interesting cloth. Learn several weave structures through samplers that include double weave cloth, lace waves, twill, and color and weave effects. May be repeated up to 12 credit hours.

Prerequisite: ART 1010, ART 2310 or ART 2330 and ART 3610 or permission of instructor. Explore more complex double weave structures and how to design interesting fabric with structure in mind. Explore new ways of thinking about cloth that includes weaving with more contemporary fiber. Emphasis is on transforming one's design concepts into woven work that is sound in structure, visually exciting, and contemporary in design. May be repeated up to 12 credit hours.

Prerequisite: ART 1010, ART 2310, ART 2610 or permission of instructor. Develop skills in a variety of surface application techniques using natural fabrics and Fiber Reactive dyes. Application methods include painting, block printing, dextrin resist, vinyl transfer, discharge, and devore. Emphasis is placed on how to use these surface techniques to create unique and visually dynamic designs. May be repeated up to 12 credit hours.
ART 3621. Surface Design II.  Studio 6. Credit 3.
Prerequisite: ART 2010, ART 2320 or ART 2330, and ART 3620 or permission of instructor. Screen-printing for repeat pattern on yardage and large-scale fabric work with emphasis on developing technical skill and a personal design aesthetic. Explore designs and design materials, learn methods for putting a design into repeat, and register print to produce an all-over multi-colored image on fabric. May be repeated up to 12 credit hours.

ART 3630, 3631. Independent Studies in Fibers.  Studio 2, 4, 6. Credit 1, 2, 3.
Prerequisite: Permission of the instructor. Individual fibers projects with emphasis on concept and design in weaving or surface design. May be repeated up to 12 credit hours.

Prerequisite: ART 2710 or permission of instructor. Intermediate glass blowing and coldworking, introduction to mold making, and exposure to a variety of professional artists' work. May be repeated up to 12 credit hours.

Prerequisite: ART 2710 or permission of instructor. Intermediate glass blowing and coldworking, introduction to mold making and exposure to a variety of professional artists' work. May be repeated up to 12 credit hours.

Prerequisite: ART 2010, ART 2320 or ART 2330 and ART 3710 and ART 3711 or permission of instructor. Advanced glassblowing and sandblasting, etching, slumping, and different types of glass forming. May be repeated up to 12 credit hours.

Prerequisite: ART 2010, ART 2320 or ART 2330 and ART 3710 and ART 3711 or permission of instructor. Advanced glassblowing and sandblasting, etching, slumping, and different types of glass forming. May be repeated up to 12 credit hours.

ART 3730. Independent Studies in Glass.  Studio 2, 4, 6. Credit 1, 2, 3.
Prerequisite: Permission of the instructor. Individual studies in glass through specific projects arranged between the instructor and student. May be repeated up to 12 credit hours.

ART 3731. Independent Studies in Glass.  Studio 2, 4, 6. Credit 1, 2, 3.
Prerequisite: Permission of the instructor. Individual studies in glass through specific projects arranged between the instructor and student. May be repeated up to 12 credit hours.

Prerequisite: ART 1010, ART 2010, ART 2310, ART 2320 or ART 2330 and ART 2810 or permission of instructor. The techniques and aesthetics of metalsmithing; emphasis on manipulation of sheet metal for jewelry and holloware with studies in casting, non-ferrous forging, chasing, raising, and other techniques. May be repeated up to 12 credit hours.

Prerequisite: ART 1010, ART 2310 and ART 2810, or permission of instructor. This course focuses on steel as a decorative, functional, and sculptural material. Technical assignments exploring traditional blacksmithing techniques progress to the development of an individual's style of work. May be repeated up to 6 credit hours.

Prerequisite: ART 2010, ART 2320 or ART 2330, and ART 3820, or permission of instructor. Continuing development in steel as a decorative, functional, and sculptural material. Technical assignments exploring traditional blacksmithing techniques progress to the development of an individual's style of work. May be repeated up to 6 credit hours.

Prerequisite: Permission of the instructor. Independent production studies and emphasis on advanced creative design and skills in either light metals or blacksmithing. May be repeated up to 12 credit hours.

ART 3831. Independent Studies in Metals.  Studio 2, 4, 6. Credit 1, 2, 3.
Prerequisite: Permission of the instructor. Independent production studies and emphasis on advanced creative design and skills in either light metals or blacksmithing. May be repeated up to 12 credit hours.

Prerequisite: ART 1010, ART 2310, ART 2910 or permission of instructor. Studies in the techniques of woodworking, furniture construction, and design. Hand and power tools, joinery, bending, stack lamination, turning, carving, and finishing. May be repeated up to 12 credit hours.

Prerequisite: ART 1010, ART 2310, ART 2910 or permission of instructor. Studies in the techniques of woodworking, furniture construction, and design. Hand and power tools, joinery, bending, stack lamination, turning, carving, and finishing. May be repeated up to 12 credit hours.

Prerequisite: ART 2010, ART 2320 or ART 2330 and ART 3910 and ART 3911 or permission of instructor. Studies in advanced woodworking construction. Emphasis on cabinetry or seating, ergonomics, structure, and design. May be repeated up to 12 credit hours.

Prerequisite: Permission of the instructor. Individual approaches to working in wood through specific projects arranged with the instructor. May be repeated up to 12 credit hours.

ART 4040. Seminar. Credit 3. Prerequisite: Successful completion of 3000 level studio classes. Aesthetic theories and criticism as related to craft material and concepts.

ART 4100. Art Tour. Credit 3. Prerequisite: ART 1030 or ART 2110 or ART 2120 or ART 3130 or ART 3150 or ART 3160 or consent of instructor. A 1.2 week trip to view internationally recognized art. A term paper is required. May be repeated for credit if trip is different.

ART 4170. Ancient Mesoamerican Art. Lec. 3. Credit 3. Art and architecture of Pre-Columbian Mesoamerican cultures, including Olmec, Maya, Teotihuacan, Monte Alban, Veracruz, Mixtec, and Aztec.

ART 4310. Independent Studies in Drawing I. Studio 6. Credit 3. Prerequisite: Permission of the instructor. Directed study in selected drawing media in specific projects agreed upon by the instructor and student.

ART 4311. Independent Studies in Drawing II. Studio 6. Credit 3. Prerequisite: Permission of the instructor. Directed study in selected drawing media in specific projects agreed upon by the instructor and student.

ART 4410. Senior Thesis in Painting. Credit 1-6. Max. 18. Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual, and design accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4510. Senior Thesis in Clay. Credit 1-6. Max. 18. Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual, and design accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4540. Special Problems in Clay. Studio 2, 4, 6. Credit 1, 2, 3. Prerequisite: ART 3510, ART 3511 and permission of the instructor. Periodic advanced studio/lecture courses covering special topics not addressed in regular course offerings. May be repeated up to 12 credit hours.

ART 4610. Senior Thesis in Fiber. Credit 1-6. Max. 18. Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual and design accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4640. Special Problems in Fibers. Studio 2, 4, 6. Credit 1, 2, 3. Prerequisite: ART 2610 or permission of the instructor. Individual studio projects agreed upon by the instructor and student. May be repeated up to 12 credit hours.

ART 4710. Senior Thesis in Glass. Credit 1-6. Max. 18. Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual, and design accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4740. Special Problems in Glass. Studio 2, 4, 6. Credit 1, 2, 3. Prerequisite: Permission of the instructor. Individual studio projects agreed upon by the instructor and student. May be repeated up to 12 credit hours.

ART 4810. Senior Thesis in Metals. Credit 1-6. Max. 18. Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical, conceptual, and design accomplishment in a stylistically coherent body of work. A twelve credit series of Senior Thesis classes culminate in a required final Thesis Exhibition. May be repeated up to 18 credit hours.

ART 4840. Special Problems in Metals. Studio 2, 4, 6. Credit 1, 2, 3. Prerequisite: Permission of the instructor. Individual studio projects agreed upon by the instructor and student. May be repeated up to 12 credit hours.

ART 4910. Senior Thesis in Wood. Credit 1-6. Max. 18. Prerequisite: Permission of the instructor and departmental approval. Guided individual studio projects leading to a professional level of technical accomplishment in a stylistically coherent body of work. A 12 credit series of Senior Thesis classes culminate in the required final exhibition. May be repeated up to 18 credit hours.

ART 4940. Special Problems in Wood. Studio 2, 4, 6. Credit 1, 2, 3. Prerequisite: Permission of the instructor. Individual studio projects agreed upon by the instructor and student. May be repeated up to 12 credit hours.

ART 4950. Special Problems in Art. Credit 1-3. Max. 9. Individual study on a topic agreed upon by the instructor and the student.

ART 4960. Special Problems in Art. Credit 1-3. Max. 9. Individual study on a topic agreed upon by the instructor and the student.

ART 4970. Special Problems in Art. Credit 1-3. Max. 9. Individual study on a topic agreed upon by the instructor and the student.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.
Astronomy (ASTR)

Prerequisite: Background knowledge of high school algebra and geometry. Studies of the solar system, stars, and galaxies; recent advances in astronomy and astrophysics; and quasars, pulsars, black holes, cosmological theories, space exploration; non-technical survey of the principles of optics, and atomic and nuclear physics as applied to astronomy.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Biology (BIOL)

BIOL 1000. Introduction to Biological Methods.  
Lec. 0. Lab. 2. Credit 1.  
An introduction and orientation to the literature, research and computing skills utilized in the life sciences.

◆ BIOL 1010. Introduction to Biology I.  
Lec. 3. Lab. 2. Credit 4.  
Introduction to concepts of biology and their relationships to current and future social problems. Non-biology majors only.

◆ BIOL 1020. Introduction to Biology II.  
Lec. 3. Lab. 2. Credit 4.  
Note: BIOL 1010 is not a prerequisite. Survey of plant and animal diversity, introductory ecology, and man's impact on the environment. Non-biology majors only.

BIOL 1050. Principles of Biology.  
Lec. 3. Credit 3.  
A basic foundation in biological principles common to all organisms with an emphasis on molecules, cells, metabolism, genetics, reproduction, evolution, and speciation.

◆ BIOL 1110. General Zoology.  
Lec. 3. Lab. 2. Credit 4.  
Introduction to principles of zoology.

◆ BIOL 1120. General Botany.  
Lec. 3. Lab. 2. Credit 4.  
Introduction to principles of botany.

Lec. 2. Lab. 2. Credit 3.  
Basic concepts of biology including botany, zoology, and environmental applications. This course will not count as a part of a biology sequence.

Lec. 1. Credit 1.  
An introduction to biological terminology, including zoological, botanical, ecological, and medical terminology, with an emphasis on developing proficiency with the use of wood roots and derivations.

◆ BIOL 2010. Human Anatomy and Physiology I.  
Lec. 3. Lab. 2. Credit 4.  
Prerequisite: Sophomore standing. Structure and function of the human body for nursing and other majors requiring a detailed examination of the topic. First course in a two course sequence. (See BIOL 2020).

◆ BIOL 2020. Human Anatomy and Physiology II.  
Lec. 3. Lab. 2. Credit 4.  
Prerequisite: BIOL 2010. Continuation of BIOL 2010.

BIOL 2250. Plants and People.  
Lec. 3. Credit 3.  
Interrelationships between plants and people, including past, present, and future uses of plants, the economic value of plants, and the role of conservation in the preservation of plant resources.

BIOL 2350. Introductory Anatomy and Physiology.  
Lec. 3. Lab. 2. Credit 4.  
An introductory course in human anatomy and physiology intended for students of health and physical education, human ecology, psychology, and other majors requiring a basic survey of the topics.

BIOL (WFS) 2991-2994. Topics.  
Credit 1.  
Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299. Topics or BIOL (WFS) 499. (599.) Advanced Topics courses are earned.

BIOL 3040. Comparative Vertebrate Anatomy.  
Lec. 3. Lab. 2. Credit 4.  
Prerequisite: BIOL 1050, BIOL 1110. Anatomy and phylogeny of vertebrates and comparative study of systems of representative types.

BIOL 3060. Comparative Vertebrate Embryology.  
Lec. 3. Lab. 2. Credit 4.  
Prerequisite: BIOL 3140 or BIOL 3040. Gametes, fertilization, cleavage, and gastrulation. Derivatives of the germ layers and organ systems in representative vertebrates.

BIOL 3100. Genetics (RODP Course).  
Credit 3.  
Prerequisite: BIOL 1110 and BIOL 1120. Basic principles of traditional transmission genetics, as well as modern molecular genetics, delivered via PowerPoint presentations with an audio component. Note: This course is for teachers seeking a Biology Add-on Endorsement; it will not substitute for required genetics courses in Biological Sciences or related majors.

Lec. 3. Credit 3.  
The relationship between plants and animals and their environment. (Same as WFS 3120.) This course cannot be taken as part of the university science requirement and credit will not be given for both BIOL/WFS 3120 and BIOL/WFS 3130.

BIOL 3130. General Ecology.  
Lec. 3. Lab. 3. Credit 4.  
The relationship between plants and animals and their environment. The laboratory provides examples of concepts discussed in lecture and analytical procedures used in interpreting data. (Same as WFS 3130.)
Prerequisite: BIOL 1110. An introduction to structure and function of cells.

Prerequisite: BIOL 1110. Introduction to basic concepts of microbiology (non-medical). Intended for students not in health-science programs. Credit will not be given for both BIOL 3200 and BIOL 3230.

BIOL 3230. Health Science Microbiology.  Lec. 3. Lab. 3. Credit 4.
Prerequisite: Sophomore standing. Introduction to microbiology. Intended for students majoring in nursing or other preprofessional programs. Credit will not be given for both BIOL 3200 and BIOL 3230.

BIOL 3240. Field Botany.  Lec. 2. Lab. 3. Credit 3.
Prerequisite: BIOL 1120. Survey of regional flora (herbs, shrubs, & trees) focusing on gymnosperms and angiosperms. Emphasis on nomenclature, structural characteristics, identification of species using a dichotomous key, and characteristics of plant families.

BIOL 3330. Entomology.  Lec. 2. Lab. 2. Credit 3.
Common harmful and beneficial insects of this region and their control.

Prerequisite: BIOL 1050, BIOL 1110. General principles of animal function.

Prerequisite: BIOL 1110 and BIOL 1120. Introduction to the basic concepts of ecology, and the study of organisms and their interactions with the environment delivered primarily via PowerPoint presentations. Note: This course is for teachers seeking a Biology Add-on Endorsement; it will not substitute for required ecology courses in Biological Sciences or related majors.

Prerequisite: Junior standing. An introduction to ethics and humanism in medicine as a means of understanding the basic values and tenets of the medical profession. The course is especially designed for students who plan to become physicians, physical therapists, physician assistants, nurse practitioners, and related health-care professionals.

Prerequisite: BIOL 1110 and BIOL 1120. Principles and laws governing inheritance in plants and animals including man.

Prerequisite: Junior standing. Locating and using resource materials, technical writing, and oral presentations in biological disciplines.

BIOL 4000 (5000). General Parasitology.  Lec. 3. Lab. 2. Credit 4.
Prerequisite: BIOL 1110 and BIOL 3130 or WFS 3130. Biology of animal agents and vectors of diseases with emphasis placed on medical parasitology and organisms that parasitize fish and wildlife species.

BIOL 4040 (5040). Immunology.  Lec. 3. Credit 3.
Prerequisite: Junior standing. Introduction to basic principles of cellular and molecular immunology.

BIOL 4060 (5060). Hormones and Chemical Communication.  Lec. 3. Credit 3.
Prerequisite: BIOL 3140 and CHEM 1110 or CHEM 1210. A survey of hormones, their functions and mechanisms of action in vertebrate animals, including humans.

BIOL 4100 (5100). Evolutionary Biology. Lec. 3. Credit 3.
Prerequisite: BIOL 3810 and BIOL 3130 or WFS 3130. Theories, evidences, principles, and examples of organic evolution. Emphasis on anatomical, chemical, ecological, geological, anthropological, and genetic factors.

Prerequisite: BIOL 3200 or BIOL 3230. Diversity, ecology, and taxonomy of protozoa, and the importance of protozoa as agents of human disease and as model organisms for studying eukaryotic cell biology.

BIOL 4130 (5130). Environmental Microbiology.  Lec. 2. Lab. 2. Credit 3.
Prerequisite: BIOL 3200 or BIOL 3230. The function of microorganisms in the environment.

BIOL 4150 (5150). Molecular Genetics.  Lec. 3. Credit 3.
Prerequisite: BIOL 3810, CHEM 3005 or CHEM 3020. Molecular basis of inheritance with special emphasis on microorganisms.

BIOL 4160 (5160). Genetic Engineering Laboratory.  Lec. 4. Credit 2.
Prerequisite or corequisite: BIOL 4150 (5150). Techniques of bacterial genetics and recombinant DNA methodology.

BIOL 4220 (5220). Biostatistics.  Lec. 3. Credit 3.
Probability and frequency distribution; statistical populations and samples; and tests of hypotheses used in biological research. (Same as WFS 4220.)

Prerequisite: Junior standing. Introduction to basic principles underlying the behavior of animals. (Same as WFS 4230.)

Prerequisite: BIOL 3240. Principles of evolutionary relationships among major plant groups, with an emphasis on the phylology of gymnosperms and flowering plant families.

BIOL 4250 (5250). Economic Botany.  Lec. 3. Credit 3.
Prerequisite: BIOL 1120. Interrelationships between plants and people. Topics include a survey of the past, present, and future
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uses of plants and the role of conservation biology in the preservation of plant resources.

**BIOL 4300 (5300). Plant Speciation and Evolution.**  
Lec. 3. Credit 3.  
Prerequisite: BIOL 1120. Principles of the evolution of plants at the micro. and macroevolution levels, including a survey of relevant primary and secondary literature.

**BIOL 4310 (5310). Plant Anatomy.**  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: Junior standing. A comparative study of the structure of vascular plants in relation to function.

**BIOL 4320 (5320). Plant Physiology.**  
Lec. 2. Lab. 3. Credit 3.  
Physiological activities of seed plants, including photosynthesis, respiration, mineral nutrition, flowering, seed formation, and dormancy.

**BIOL 4330 (5330). Plant Ecology.**  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: BIOL 3130 or WFS 3130. Biotic and abiotic factors affecting the distribution and abundance of plant species and the role of plants in ecosystem structure and function.

**BIOL 4418. Biology Lab for Additional Endorsement Program (RODP Course).** Credit 2.  
Prerequisite: BIOL 3100, BIOL 3550, and BIOL 4417. This is an on-ground laboratory course designed for students who are seeking a Biology Additional Endorsement. Successful completion of this course will satisfy the required lab components for this program. The exercises will provide hands-on experience to complement the on-line lab components of BIOL 3550 (Ecology), BIOL 3100 (Genetics) and BIOL 4417 (Anatomy and Physiology).

**BIOL 4430 (5340). Vascular Plant Biology.**  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: BIOL 1120. Morphological and phylogenetic survey of the vascular plants.

**BIOL 4610 (5610). Invertebrate Zoology.**  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: BIOL 3130 or WFS 3130. Biology of invertebrates with emphasis on morphology, systematics and ecology.

**BIOL 4630 (5630). Ornithology.**  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: Junior standing. General survey of the class Aves with emphasis on morphology, identification and ecology of local birds. (Same as WFS 4630.)

**BIOL 4650 (5650). Marine Biology.**  
Lec. 3. Lab. 2. Credit 4.  
Prerequisite: BIOL 3130 or WFS 3130. An introduction to the study of the marine environment and marine organisms. (Same as WFS 4650.)

**BIOL 4750 (5750). Medical Microbiology.**  
Lec. 2. Lab. 4. Credit 4.  
Prerequisite: BIOL 3200 or BIOL 3230. A survey of microorganisms of medical importance with emphasis on the bacteria and viruses. Principles of infectious disease, including diagnostic methods and treatments. Laboratory exercises demonstrating methods of isolating and identifying pathogenic microorganisms.

**BIOL 4780 (5780). Phycology.**  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: College algebra and two semesters of chemistry.  
Prerequisite: Consent of instructor required. Microbial production of foods and chemicals; microorganisms in food spoilage.

**BIOL 4810 (5810). Ichthyology.**  
Prerequisite: Junior standing. Classification, structure, and function, phylogeny, and geographical distribution of fishes; emphasis on North American freshwater species. (Same as WFS 4810.)

**BIOL 4820 (5820). Mammalogy.**  
Prerequisite: Junior standing. Classification, structure and function, phylogeny, and geographical distribution of mammals; emphasis on Tennessee mammals. (Same as WFS 4820.)

**BIOL 4830 (5830). Herpetology.**  
Prerequisite: Junior standing. Identification, classification, habits, life histories, and geographical distribution of amphibians and reptiles; emphasis on North American species. (Same as WFS 4830.)

**BIOL 4840 (5840). Limnology.**  
Prerequisite: Junior standing. Physiochemical and biological dynamics of inland water. (Same as WFS 4840.)

**BIOL 4850 (5850). Applied Microbiology.**  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: Consent of instructor required. Microbial production of foods and chemicals; microorganisms in food spoilage.

**BIOL 4900. Internship in Biology.** Credit 3.  
See instructions prior to enrolling. Students work with a public agency or private company or organization that is compatible with their interest. (May be taken twice if the assignments are with different organizations or with different divisions with an organization.)

**BIOL 4940 (5940). Radiation Biology.**  
Lec. 3. Credit 3.  
Prerequisite: Junior standing. Effects of ionizing radiation on biological systems.

**BIOL (WFS) 4991-4994 (5991). Advanced Topics.** Credit 1.  
Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299. Topics or BIOL (WFS) 499. (599.) Advanced Topics courses are earned.

**Gulf Coast Research Laboratory Program (MBIO)**

**MBIO 3000. Oceanography I: Physical, Chemical and Geological.** Summer. Credit 5.  
Prerequisite: College algebra and two semesters of chemistry.
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Integration of chemical, geological, and physical oceanography to provide a multidisciplinary approach to the fundamentals of oceanography. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 3010. Oceanography II: Marine Biology.--Summer.
Prerequisite: Eight semester hours of biology. General introduction to marine biology with emphasis on local fauna and flora. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4030 (5030). Marine Invertebrate Zoology.--Summer.
Prerequisite: 16 semester hours of biology. Structure, classification, phylogeny, and function in Protozoa through the Lophophorata. Observation of their ecology and behavior. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4040 (5040). Parasites of Marine Animals.--Summer.
Prerequisite: BIOL 3200 or BIOL 3230 or consent of instructor. Morphology, taxonomy, life histories, and host-parasite relationships. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4050 (5050). Marine Ecology.--Summer.  Credit 5.
Prerequisite: 16 semester hours of biology, including general zoology, general botany, and invertebrate zoology. Relationship of marine organisms to their environment. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Prerequisite: 16 semester hours of biology and junior standing or consent of instructor. Taxonomy, distribution, trophic relationships, reproductive strategies, and adaptations. Emphasis on northern Gulf marshes. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Prerequisite: 16 semester hours of zoology, including invertebrate and vertebrate zoology of ichthyology. Technology, principles, and problems of aquaculture. Emphasis on marine species. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Prerequisite: 12 semester hours of biology and junior standing. Marine Chordata, including lower groups and the mammals and birds. Emphasis on fishes. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4090 (5090). Marine Microbiology.--Summer.  Credit 5.
Prerequisite: BIOL 3200 or BIOL 3230 or consent of instructor. Sampling procedures, taxonomy of marine bacteria, mineralization, microbial, fouling, pollution, and diseases of marine animals. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Prerequisite: Consent of instructor. Overview of practical marine fishery management program. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Prerequisite: Eight semester hours of biology, including introductory botany or consent of instructor. Survey of the principal groups of marine algae and maritime flowering plants. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4210 (5210). Coastal Vegetation.--Summer.  Credit 3.
Prerequisite: 10 semester hours of biology, including general botany. Aspects of coastal vegetation. Emphasis on local examples. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Prerequisite: General botany, plant taxonomy, plant physiology, general ecology or consent of instructor. Identification, composition, structure, distribution, primary productivity, ecology, and development. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4300 (5330). Comparative History of Marine Organisms.--Fall, Spring, Summer.  Credit 1-6.
Prerequisite: Consent of instructor. Processing tissues using light, transmission electron, and scanning electron microscopy. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Prerequisite: 16 semester hours of chemistry, three to six semester hours of biology and geology or consent of instructor. Chemical aspects of oceans and interactions of chemistry, biology, and geology in marine environments. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Prerequisite: 16 semester hours of zoology and/or psychology or consent of instructor. Behavior, neuroanatomy, and neurophysiology. Emphasis on neural mechanisms underlying behavior. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4570 (5570). Marine Science for Teachers.--Summer.  Credit 3.
Prerequisite: Biology background or consent of instructor. Introduction to marine science for public school teachers. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.
Prerequisite: Six semester hours of biology. Materials and methods in teaching marine science to elementary students. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4590 (5990). Special Problems in Marine Science. -- Fall, Spring, Summer. Credit 1-6.
Prerequisite: To be set by problem director. Research oriented problems reported in writing. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

MBIO 4910 (5910). Special Topics in Marine Science. -- Fall, Spring, Summer. Credit 1-6.
Prerequisite: To be set by topics advisor. Special study in a field topic approved by the GCRL Topics Advisor and the student's institutional advisor. This course is offered at the Gulf Coast Research Laboratory, Ocean Springs, MS.

Business Law (LAW)

Enrollment in junior- and senior-level law courses requires junior standing. All business majors must have completed the Basic Business Program.

The legal aspects of the business environment including antitrust, administrative, consumer, and employment law; business organizations; and principles of contracts.

Law related to business practices and procedures, including personal property, bailments, sales, commercial paper, and legal aspects of organizing, operating, and terminating a business.

LAW 4900. Topics. Lec. 3. Credit 3.
Prerequisite: Senior standing or consent of instructor. Selected topics involving the legal environment. A student may take LAW 4900 twice provided the topic is different each time.

The basic legal instruments and legal principles comprising the legal environment of business, integrated with contemporary ethical, social, and political issues.

Business Management (BMGT)

Enrollment in junior- and senior-level law courses requires junior standing. All business majors must have completed the Basic Business Program.

Management functions and processes as applied to organizations with special emphasis on the behavioral aspects.

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BMGT 3600. International Management. Lec. 3. Credit 3.
Prerequisite: BMGT 3510. Explore organization and management issues in international business.

Prerequisite: BMGT 3510. Personnel management policies, practices, and laws.

Principles and practices in developing appropriate business messages that report primary and secondary research in a variety of styles.

BMGT 4120 (5120). Compensation Administration. Lec. 3. Credit 3.
Prerequisite: BMGT 3630. Theory and practice of determining wages, salaries, and employee benefits.

Prerequisite: BMGT 3630. An overview of legal issues affecting the employment relationship in business, from a managerial perspective.

Prerequisite: BMGT 3630. Development of interpersonal skills for managing conflict and negotiations in business.

Prerequisite: BMGT 3510. Integration of behavioral theory and management practice with a focus on the application of theory as a means of developing the skill and competencies needed for managerial success.

BMGT 4610. Leadership and Employee Development. Lec. 3. Credit 3.
Prerequisite: BMGT 3510. Development of skills in leadership, employee development, training, and supervision in a wide range of business contexts.

BMGT 4720. Business Communication II. Lec. 3. Credit 3.
Prerequisite: BMGT 3720. Analyzing and presenting solutions for cases and problems involving business transactions.

BMGT 4900. Special Topics in Management. Lec. 3. Credit 3.
Consent of instructor. Current topics in management.

Prerequisite: FIN 3210, MKT 3400, and BMGT 3510. Senior standing. A capstone course stressing management problem analysis, problem solving, and decision-making.

Fundamentals of management that permeate organizations,
Tennessee Technological University

including administrative structure and organizational environment, operations and organizational behavior.

Career Technical Education (CTE)

CTE 3230. Shop, Lab, and Classroom Organization for Career Technical Education.   Lec. 3. Credit 3.
Orientation to the safe and efficient management of classroom, shop, and lab facilities.

A study of the fundamental steps involved in the development of curriculum in industrial education.

CTE 4040 (5040). Advisory Committees in Industrial Education.   Lec. 3. Credit 3.
A study on how to effectively establish and utilize advisory committees for student programs in industrial education.

CTE 4050 (5050). Academic and Vocational Interdependence.   Lec. 3. Credit 3.
A study on how to infuse the academic and vocational programs into a unified educational delivery system.

CTE 4060 (5060). Safety in Industrial Education.   Lec. 3. Credit 3.
A study of the safety requirements associated with the provision of a safe learning environment in industrial education.

CTE 4070 (5070). History and Philosophy of Industrial Education.   Lec. 2. Credit 2.
History of industrial education in the United States and special focus on the development of a personal philosophy of industrial education.

CTE 4080 (5080). Career Technical Student Organizations and Teaching Supervision.   Lec. 3. Credit 3.
The methods of establishment, supervision and evaluation of vocational youth organizations in industrial education.

Overview of the nature of special needs students, technique of modification of vocational curriculum, and development of appropriate teaching materials.

Laboratory approach providing opportunities for experienced educational personnel to concentrate their study in depth.

Chemical Engineering (CHE)

CHE 1010. Introduction to Chemical Engineering.   Lec. 1. Credit 1
Prerequisite: Freshman Standing. Information is provided to potential chemical engineering majors in a variety of areas including: curriculum linkages, the profession, collaborative work environments, faculty interaction, mentoring opportunities, professional societies, and laboratory skills.

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CHE 1510. Computer Applications in Chemical Engineering.   Lab. 2. Credit 1
Software to be used in subsequent Chemical Engineering courses will be introduced in this course.

CHE 2010. Introduction to Chemical Engineering Analysis.   Lec. 3. Credit 3
Prerequisite: ENGR 1120, CHEM 1120, and MATH 1910. Quantitative descriptions of chemical engineering systems. Conservation equations, rate processes, and mathematical analysis.

Prerequisite: CHEM 1120 and MATH 1910. Quantitative descriptions of chemical and biological engineering systems. Conservation of mass and energy for single and multi-process units as well as for reactive and non-reactive systems. Lab introduces report writing, basic measurement techniques, and applications of mass conservation equations.

CHE 2210. Chemical Engineering Laboratory I.   Lab. 3. Credit 4.
Laboratory experiences with emphasis on measurement techniques and report writing.

CHE 3010. Thermodynamics of Chemical Processes.   Lec. 3. Credit 3.
Prerequisite: CHEM 1120 and MATH 1910. Application of the 1st and 2nd Laws of Thermodynamics to the analysis of single and multi-phase processes for both closed and open systems.

CHE 3020. Chemical Engineering Thermodynamics II.   Lec. 3. Credit 3.
Prerequisite: CHEM 3010 or equivalent. Prediction of phase equilibrium, chemical equilibrium, and thermodynamic analysis of processes.

CHE 3021. Separations and Solution Thermodynamics.   Lec. 3. Lab 2. Credit 4.
Prerequisite: CHEM 3010 or equivalent. Analysis and prediction of mixture properties at equilibrium in single and multiple phases. Lab is focused on solution thermodynamic topics and industrially-relevant separation processes.

Prerequisite: CHEM 2010 and MATH 2110. Principles, design and operation of systems for heat transfer and the transportation of fluids and solids.

Prerequisite: CHEM 2011 and MATH 2120. Energy and mass conservation principles. Experimental studies of heat and diffusive mass transfer. Design and operation of systems for heat and mass transfer with applications to heat exchange and diffusive motion. CHE 2011 and MATH 2120 may be taken concurrently.

Prerequisite: CHEM 3111 and MATH 2110. Theory of mass and
pollutants from chemical processes.

Prerequisite: CHE 3110. Problems of air pollution and their solutions. Analysis and design of devices for the control of air pollutants from chemical processes.

CHE 3730. Chemical Engineering Operations.  
Prerequisite: CHE 1510. Decision-making techniques as applied to management of chemical processing plants.

CHE 3990. Introduction to Research Methods.  
Prerequisite: Consent of instructor. Introduces students to research methods used within chemical engineering.

CHE 4110 (5110). Computational Heat, Mass and Momentum Transfer  
Prerequisite: CHE 3110. General equations describing heat, mass, and momentum transport. Similarities and differences in transport properties are studied.

CHE 4131 (5131). Transfer Science III: Diffusion and Diffusive-Convective Mass Transfer.  
Prerequisite: CHE 2011, CHE 3111, and CHE 3121. Mathematical description of diffusion and diffusive-convective mass transfer. Mass transfer with reaction. Dimensional Analysis. Mass transfer in one and two-dimensions in Cartesian, cylindrical, and spherical coordinates. Integrated labs demonstrating the concept of diffusion, computational experiments, and demonstrating the effect of geometry, flow, etc., on mass transfer.

CHE 4210 (5210). Chemical Reaction Engineering.  
Prerequisite: CHE 3021. Chemical reaction kinetics and chemical reactor design. There is an emphasis on homogeneous reactions and ideal and non-ideal reactors. Introduction to laboratory experiments to illustrate typical situations found in chemical reacting systems: kinetics parameter determination, residence time visualization, introduction to different types of reactors, (i.e., batch, tubular and gradientless).

CHE 4240. Chemical Engineering Capstone Laboratory.  
Prerequisite: CHE 3730. Laboratory experiences in typical chemical engineering systems. Experiments are designed to integrate the fundamental topics with applications from several subject areas.

CHE 4241. Chemical Engineering Laboratory IVb.  
Prerequisite: CHE 4130. Laboratory experiences in biochemical engineering systems.

CHE 4300 (5300). Introduction to Air Pollution.  
Prerequisite: CHE 3110. Problems of air pollution and their solutions. Analysis and design of devices for the control of air pollutants from chemical processes.

CHE 4330 (5330). Polymer Engineering.  
Prerequisite: CHEM 3020. Polymerization kinetics for key commercial polymers, structure/property relationships and characterization of key polymers, processing fundamentals, fundamentals of formulation of polymer composites and blends (nanocomposites, biopolymers.)

CHE 4410. Process Design I.  
Prerequisite: CHE 3121. Design and synthesis of chemical systems using basic engineering principles with integration of reliability, safety and environmental aspects. The economics involved in the design of chemical plants such as capital cost, profitability, operating costs, and alternative evaluation.

CHE 4420. Process Design II.  
Prerequisite: CHE 4410. Continuation of Design I but with emphasis on more detailed and complex aspect of designing a chemical plant. Particular attention is given to the use of optimization techniques for equipment sizing and process flowsheet synthesis with consideration of economics. Introduction to computer-aided process design applications.

Prerequisite: Senior standing in engineering, mathematics, chemistry (calculus-based), or physics. Selected materials synthesis for metals, ceramics, and their composites; application of fracture mechanics and failure models; mechanical, chemical, and morphological characterization theory and practice; and materials design.

CHE 4510 (5510). Applied Mathematics in Chemical Engineering.  
Prerequisite: CHE 3021, CHE 3121, and MATH 2120. Applied numerical methods and the solution of differential equations in chemical engineering.

CHE 4540. Process Dynamics and Control.  
Prerequisite: CHE 3121 and MATH 2120. Analysis of the dynamic behavior of chemical processes. Basic control principles and methods of measuring and controlling process variables.

CHE 4660 (5660). Biochemical Engineering.  
Prerequisite: CHE 4210 (5210) or consent of instructor. Applications of chemical engineering principles to the study of biochemical systems.

CHE 4661 (5661). Transport in Biochemical and Biological Processes.  
Prerequisite: CHE 4210 (5210) or consent of instructor. Applications of chemical engineering principles to the study of biochemical and biological systems. Lab is centered around various techniques used in the biochemical and biological field.

CHE 4810. Developing Areas in Chemical Engineering.  
Prerequisite: Senior standing in Chemical Engineering. Introduction to an emerging subject area in chemical
Chemistry majors may not earn credit in both CHEM 1010 and 1110 or both 1020 and 1120. Credit will not be given for both CHEM 1210, 1310, and any of the above courses.

CHEM 1000. Foundations of Chemistry. Lec. 3. Credit 3.
An introductory course for students without sufficient high school background in chemistry. Topics include metric system, atomic structure, bonding, stoichiometry, solutions and some descriptive chemistry. Not degree credit as Chemistry course. May be used for elective credit in some programs.

◆CHEM 1010. Introduction to Chemistry I. --Fall, Spring. Lec. 3. Lab. 3. Credit 4.
Prerequisite: CHEM 1010 is prerequisite to CHEM 1020. Overview of chemical principles and applications. Laboratories emphasize general principles of chemistry.

CHEM 1020. Introduction to Chemistry II. --Fall, Spring.
Lec. 3. Lab. 3. Credit 4.
Prerequisite: CHEM 1010 is prerequisite to 1020. Overview of chemical principles and applications. Laboratories emphasize general principles of chemistry.

CHEM 1050. Foundations of Chemistry Laboratory. Lab. 2. Credit 1.
Corequisite: CHEM 1000. Selected experiments to complement lecture material in CHEM 1000.

◆CHEM 1110. General Chemistry I. --Fall, Spring. Lec. 3. Lab. 3. Credit 4.
Prerequisite: CHEM 1110 is prerequisite to CHEM 1120. Basic course in general chemistry for curricula requiring more than one year of chemistry. Laboratory includes qualitative analysis procedures.

CHEM 1111. General Chemistry I Honors Recitation. Rec. 1. Credit 0.
Corequisite: CHEM 1110. An ACT score of 30 or higher is also recommended. Selected topics to add depth to the understanding of the material in CHEM 1110. Honors students can receive honors credit for CHEM 1110 by satisfactorily completing both CHEM 1110 and CHEM 1111.

◆CHEM 1120. General Chemistry II. --Fall, Spring. Lec. 3. Lab. 3. Credit 4.
Prerequisite: CHEM 1110 is prerequisite to 1120. Basic course in general chemistry for curricula requiring more than one year of chemistry. Laboratory includes qualitative analysis procedures.

CHEM 1121. General Chemistry II Honors Recitation. Rec. 1. Credit 0.
Corequisite: CHEM 1120. A grade of A or B in CHEM 1110 is also recommended. Selected topics to add depth to the understanding of the material in CHEM 1120. Honors students can receive honors credit for CHEM 1120 by satisfactorily completing both CHEM 1120 and CHEM 1121.

Introduction to chemical principles and their applications to health and disease, which will include chemical structures, moles, organic chemistry and biochemistry. A knowledge of general mathematics is needed for the use of conversion factors, making of solutions, and calculation of dosages and dilutions. This course will not count as part of a chemistry sequence.

◆CHEM 1310. Concepts of Chemistry. --Fall, Spring. Lec. 2. Lab. 2. Credit 3.
Basic principles of chemistry including atomic structure, chemical bonding, basic stoichiometry, organic and inorganic compounds, and kinetic theory. Will not count as part of a chemistry sequence.

This course engages the student in meaningful classroom and
out-of-the-classroom activities. This is intended for chemistry majors and emphasizes information, activities, and requirements important to becoming an active and competent chemist.

CHEM 1971, 1972. Special Topics in General Chemistry.---Fall, Spring. Lec. 0-3. Lab. 0-3. Credit 1-3. Prerequisite: Consent of chair and instructor. Timely topics in chemistry. Course may be taken for credit more than once.

CHEM 2010. Introduction to Inorganic Chemistry.---Fall. Lec. 3. Credit 3. Prerequisite: CHEM 1120. Introduction to the basic principles of inorganic chemistry including bonding, nomenclature, coordination chemistry, molecular orbital theory, and basic transition metal organometallic chemistry.


CHEM 2810. History of Scientific Thought.---Fall. Lec. 3. Credit 3. Development of the scientific theories and concepts from antiquity through the 18th century. Does not count as technical elective in chemistry.


CHEM 3010. Organic Chemistry I.---Fall, Spring. Lec. 3. Lab. 3. Credit 4. Prerequisite: CHEM 1120 with a grade of C or better or a minimum grade of B in CHEM 1010 and CHEM 1020. Study of carbon-containing compounds using the functional group approach and an emphasis in simple mechanisms of aliphatic and aromatic compounds.

CHEM 3020. Organic Chemistry II.---Fall, Spring. Lec. 3. Lab. 3. Credit 4. Prerequisite: CHEM 3010 with a grade of C or better. Study of carbon-containing compounds using the functional group approach and an emphasis in simple mechanisms of aliphatic and aromatic compounds.

CHEM 3410. Quantitative Analysis.---Fall. Lec. 2. Lab. 6. Credit 4. Prerequisite: CHEM 1120. Introduction to chemical analysis including titrimetric and gravimetric methods involving acid/base, oxidation/reduction, and complexometric techniques. Application of mass action, equilibria, and indicators to chemical analysis. Introduction to instrumental analysis including electrochemical and spectroscopic methods.

CHEM 3420. Analytical Applications.---Spring. Lec. 2. Lab. 3. Credit 3. Prerequisite: CHEM 3410. The application of wet chemical and instrumental methods of analysis to real problems in chemistry, biochemistry, and the environment.

CHEM 3500. Elements of Physical Chemistry.---Spring. Lec. 3. Credit 3. Prerequisite: CHEM 1120, MATH 1830 or MATH 1910. Survey of physical chemistry designed for those desiring the B.S. degree with a major in chemistry, education, pre-professional studies, biology or students in general.

CHEM 3510-3520. Physical Chemistry.---Fall, Spring. Lec. 3. Lab. 3. Credit 4. Prerequisite: CHEM 1120, MATH 1920, PHYS 2020 or PHYS 2110 (may be taken concurrently). Introduction to quantum mechanics and spectroscopy, the gas state, thermodynamics and thermochemistry, heterogeneous equilibria, kinetics, electrochemistry, colloids, photochemistry, and the solid state.

CHEM 3710. Chemistry and the Environment.---Spring. Lec. 2. Lab. 3. Credit 3. Prerequisite: CHEM 1120 or consent of instructor. Basic concepts of environmental chemistry. Not for chemistry majors.

CHEM 3990. Special Problems in Chemical Education. Lab. 1. Credit 1. Prerequisite: CHEM 1110, CHEM 1120, six additional hours of chemistry and consent of a faculty research mentor and the departmental chairperson. Independent study of special topics in chemical education under the direction of a faculty mentor. Must be taken twice, preferably in consecutive semesters. Restricted to secondary education chemistry majors.

CHEM 4110 (5110). Inorganic Chemistry.---Spring. Lec. 3. Credit 3. Prerequisite: CHEM 2010 and CHEM 3500 or CHEM 3510. Correlation of physical and chemical properties of inorganic compounds and atomic structure.


CHEM 4210 (5210). Chemistry of Polymers.---Fall. Lec. 3. Credit 3. Prerequisite: CHEM 3020 and CHEM 3500 or CHEM 3510. Preparation, structure, and physical and chemical properties of organic polymers. Experimental determination of average molar mass and its correlation to macroscopic properties. Thermal and viscoelastic behavior.

CHEM 4310 (5310). Nuclear and Radiochemistry.---Spring. Lec. 2. Lab. 3. Credit 3. Prerequisite: CHEM 3500 or CHEM 3510 (may be taken concurrently). Introduction to theory of nuclear stability and decay processes. The laboratory emphasizes the detection,
Prerequisite: CHEM 3020 and CHEM 3500 or CHEM 3510. The isolation and identification of organic compounds by both chemical and physical means with emphasis on spectroscopic methods.

CHEM 4410 (5410). Forensic Chemistry.
Prerequisite: CHEM 1120, CHEM 3020, and CHEM 3410. This course will examine the application of chemical concepts and methods to the analysis of crime scene evidence.

CHEM 4500. Physiological Chemistry.--Spring.
Lec. 3. Credit 3.
Prerequisite: CHEM 3005. Introduction to the chemistry of biological molecules and the metabolic pathways as related to nutrition and physiological function. Not for chemistry majors.

CHEM 4510. Physiological Chemistry Laboratory.--Spring.
Lec. 3. Lab. 1. Credit 4.
Prerequisite: CHEM 3005. Corequisite: CHEM 4500. This course is an optional laboratory to accompany CHEM 4500 lecture. Introduction to the chemistry of biological molecules and the metabolic pathways as related to nutrition and physiological function. Not for chemistry majors.

CHEM 4520 (5520). Instrumental Analysis.--Fall.
Lec. 3. Lab. 3. Credit 4.
Prerequisite: CHEM 3410, CHEM 3510. Theory and practice of atomic spectroscopy, chromatography, and electroanalysis; discussion of selected instrumental techniques for analysis of surfaces, molecules, and particles.

CHEM 4610 (5610). General Biochemistry.--Fall.
Lec. 3. Credit 3.
Prerequisite: CHEM 3005 or CHEM 3010. Chemistry of proteins, lipids, carbohydrates and nucleic acids. Includes study of pH, buffer system, and biological separation methods.

CHEM 4620 (5620). General Biochemistry.--Spring.
Lec. 3. Credit 3.
Prerequisite: CHEM 4610 (5610). Intermediary metabolism, bioenergetics, and biosynthesis.

CHEM 4650 (5650). General Biochemistry Laboratory.--Spring.
Lec. 6. Credit 2.
Prerequisite: CHEM 4610 (5610) General Biochemistry or concurrent enrollment. Laboratory techniques associated with contemporary general biochemistry to include buffer preparation, pKa determination, amino acid analysis, protein expression, separation and purification techniques, protein determination, enzymology, equilibrium and binding constant determinations, and carbohydrate analysis. The CHEM 5650 student will engage in additional procedures in some of the experiments.

CHEM 4710 (5710). Environmental Chemistry.--Fall.
Lec. 3. Credit 3.
Prerequisite: CHEM 3005 or CHEM 3010, and CHEM 3410 or CHEM 3500 or CHEM 3510 (courses from the latter group may be taken concurrently). Basic concepts of environmental chemistry.

CHEM 4720 (5720). Advanced Environmental Chemistry.--Spring.
Lec. 2. Lab. 3. Credit 3.
Prerequisite: CHEM 4710 (5710). Advanced topics within environmental chemistry including emphasis on organic, inorganic, and analytical environmental chemistry. Case studies and contemporary literature in the field will be discussed.

CHEM 4910. Chemistry Seminar.--Fall.
Lec. 2. Credit 2.
Prerequisite: One year of chemistry. Topics to be taught include the chemical literature, employment and interviewing, computer literacy, and the organization and oral presentation of current topics in chemistry.

CHEM 4970 (5970). Special Topics.
Prerequisite: Consent of instructor. Timely topics in chemistry. Course may be taken for credit more than once.

CHEM 4980. Distinction in Chemistry Research.
Lec. 0. Credit 0.
Dissemination of independent research conducted with a Chemistry faculty advisor through participation in meetings (national meetings, state meetings and/or TTU Student Research Day), departmental seminar, and mini-thesis.

CHEM 4991, 4992, 4993. Introduction to Research.--Fall, Spring.
Lab. 3, 6, 9. Credit 1, 2, 3.
Prerequisite: Consent of instructor and departmental chairperson. Study in chemical research; to provide experience in the methodology of experimental investigation. (Maximum credit toward degree is four hours.) May not be repeated to improve grade.

Child and Family Studies (CFS)

CFS (HEC) 1000. Introduction to the Profession.
Lec. 1. Credit 1.
Prerequisite: Human Ecology and Child and Family Studies major and minor or consent of instructor. Introduction to college: the HEC/CFS majors and student opportunities. Review of the history, philosophy, trends, and professional publications and associations in HEC/CFS. Exploration of career opportunities.

Lab. 4. Credit 1.
Students participate in professional related activities via: diverse agency and educational settings through guided observations, interviews, and "hands-on" experiences; planned special activities; attendance at career-related events; and events of students’ own choosing.

CFS 1300. Introduction to the Family.
Lec. 1. Credit 1.
Corequisite: CFS 1310. Fundamental concepts and trends
related to current challenges of families, marriage, parenthood, and work.

CFS 1310. Field Experiences: Family and Community.
Lab. 4. Credit 1.
Corequisite: CFS 1300. Field experience in community agencies and organizations and family settings and their interrelationships.

CFS (HEC) 2210. Field Experience: Observation of Young Children.
Lab. 8. Credit 1.
Corequisite: CFS 2200. Learn and practice observational techniques, approaches and instruments appropriate for young children in various settings.

Lec. 3. Credit 3.

CFS (ECSP) 2410. Practicum: Young Children with Special Needs.
Lab. 4. Credit 1.
Corequisite: CFS 2400. Supervised participation in service delivery settings.

CFS 3600. Family, Community & Professional Partnerships.
Lec. 2. Credit 2
Study of the development of alliances among families, childrens' and families' advocates, and professionals. The development of collaboration and communication skills, including conferencing and interviewing skills. (Same as HEC 352: Parent Education, prior to Fall 1998).

CFS 4000. Seminar: Professional Development Issues.
Lec. 2. Credit 2.
Study of professional and multicultural issues. Examination of relevant professional topics, including legal and behavior/group management issues. Continued development of communication skills, including problem-solving, and conflict resolution.

CFS (ECSP) 4890. Seminar: Student Teaching/Internship.
Lec. 3. Credit 3.
Examination of important professional topics, including a personal and professional profile, a portfolio, a resume, professional behavior, and professional organizations. Analysis of personal and professional resources.

CFS 4900. Community Field Experience.
Lab. 4. Credit 1.
Prerequisite: Senior standing. Preparation for internship. Involvement with community agencies and programs serving children and families.

Civil and Environmental Engineering (CEE)

CEE 1020. Connections to Civil and Environmental Engineering.
Rec. 2. Credit 1.
Prerequisite: Freshman Standing. Engages the student in meaningful academic and non-academic activities introducing students to the CEE department and the civil engineering profession. Emphasizes time management and study skills, department and university resources, faculty interaction, professional and student organizations, and the civil engineering profession.

Lec. 3. Credit 3.
Prerequisite: MATH 1920 and PHYS 2110. Basic principles of two-dimensional force systems, free body diagrams, concepts of stress and strain, centroids of composite areas, kinematics, and kinetics of particles and rigid bodies.

CEE 2110. Statics.
Lec. 3. Credit 3.
Prerequisite: ENGR 1120, MATH 1920 and PHYS 2110 (ENGL 1120 and PHYS 2110 may be taken concurrently). Vector algebra, resultants, equilibrium, friction, centroids, moment of inertia, trusses, machines and frames, beam shear and moments.

CEE 3020. Surveying.
Lec. 2. Lab. 2. Credit 3.
Prerequisite: MATH 2110. Introduction to the fundamental principles, instruments, and techniques associated with surveying for highway purposes.

Lec. 2. Lab. 2. Credit 3.
Prerequisite: ENGR 1120 and CEE 3110. Characteristics and uses of aggregates, Portland cement, concrete and bituminous materials for highways and other major engineering works.

CEE 3040. Geotechnical Engineering Lab.
Lab. 2. Credit 1.
Prerequisite: CEE 3030. Measurement of basic engineering properties of soils.

CEE 3100. Computers in Civil Engineering.
Lec. 2. Lab. 2. Credit 3.
Prerequisite: ENGR 1120 and MATH 2110. Computer applications to solve civil engineering problems, algorithmic structuring, numerical methods, and error analysis.

Lec. 3. Credit 3.
Prerequisite: CEE 2110. Stress, strain, Hooke's law, extension, torsion, and bending; beam deflections, column buckling, and combined stresses.

CEE 3120. Mechanics of Materials Laboratory.
Lab. 2. Credit 1.
Prerequisite: CEE 3110. A series of experiments which demonstrate the theory of mechanics of materials and the most important characteristics of engineering materials.

CEE 3320. Structural Mechanics.
Lec. 2. Rec. 2. Credit 3.
Prerequisite: CEE 3110. Analysis of statically determinate and indeterminate structures; influence lines; and moving loads. Classical and computer methods.
Prerequisite: CHEM 1120 and MATH 2110. Fundamentals of environmental engineering with applications in water quality, water and wastewater treatment, solid waste management, air pollution, and hazardous waste management.

CEE 3420. Hydraulics.  Lec. 3. Credit 3.  
Prerequisite: ME 3720. Fundamental principles and design of water and wastewater supply, stormwater and sanitary sewer systems and their components, including pipes, pumps, storage facilities, detention basins, open-channels, and culverts.

Prerequisite or corequisite: CEE 3413. Laboratory experiments to illustrate the application of engineering fundamentals to environmental systems.

Prerequisite: CEE 3450 (5450). Water Quality Modeling.  Lec. 3. Credit 3.  
Prerequisite: CEE 3410 or consent of instructor. Mathematical modeling of chemical and biological processes occurring in streams, lakes, and estuaries, emphasizing oxygen demand and nutrient processes.

Prerequisite: CEE 3320 or ME 4640 and MATH 2010 or MATH 4510. Matrix formulations using flexibility and stiffness methods for structural analysis of skeletal structures. Finite element formulations and applications.

CEE (ME) 4160 (5160). Experimental Stress Analysis.  Lec. 2. Lab. 2. Credit 3.  
Prerequisite: CEE 3110 and MATH 2120. Introduction to theory of elasticity; photoelasticity; theory and application of strain gauges and rosettes; brittle coatings; holographic interferometry; and moiré analysis.

Prerequisite: CEE 3110, MATH 2120, or consent of instructor. Advanced topics, fracture mechanics, elastic support, non-circular shafts, curved beams, thick-walled cylinders, introduction to plates, and thin shells of revolution.

Prerequisite: CEE 3320. Design of members and structures in steel. Analysis and design of beams, tension members, compression members, members with combined stresses, and standard connections.

CEE 4320. Reinforced Concrete Design.  Lec. 2. Rec. 2. Credit 3.  
Prerequisite: CEE 3320. Design of members and structures in concrete. Design of beams, slabs, columns, and footings.

Prerequisite: CEE 4310. Special topics in analysis and design of steel structures. Plastic design, composite design, plate girders, and special connections.

CEE 4360 (5360). Advanced Topics in Structural Concrete Design.  Lec. 3. Credit 3.  
Prerequisite: CEE 4320. Special topics in the design of concrete structures. Combined footings, retaining walls, two-way slabs, and prestressed concrete.

CEE 4380 (5380). Bridge Design.  Lec. 3. Credit 3.  
Prerequisite: CEE 4310. Design of structural steel and reinforced concrete bridges.

Prerequisite: CEE 3420 or consent of instructor. The collection and disposal of solid wastes. Treatment and disposal technologies of hazardous wastes.

CEE 4420 (5420). Engineering Hydrology.  Lec. 3. Credit 3.  
Prerequisite: CEE 3420 or consent of instructor. Fundamental processes in the hydrologic cycle including precipitation, infiltration, and runoff. Quantitative approaches for engineering hydrology to estimate flows for a variety of design problems.

CEE 4430 (5430). Water and Wastewater Engineering.  Lec. 3. Credit 3.  
Prerequisite: CEE 3410 or consent of instructor. Analytical methods for use in water quality management of streams, lakes, reservoirs, and groundwater systems. Project design of water and wastewater treatment plants.

CEE 4440 (5440). Water Resources Engineering.  Lec. 3. Credit 3.  
Prerequisite: CEE 3420 or consent of instructor. Problems related to the planning and design of systems to manage water resources for flood-damage reduction, hydropower, and river navigation.

Prerequisite: CEE 3410 or consent of instructor. Mathematical modeling of chemical and biological processes occurring in streams, lakes, and estuaries, emphasizing oxygen demand and nutrient processes.

Prerequisite: Within two semesters of graduation. The design and management of the construction phase of a project: scheduling, estimating, contracts, laws, financing, and safety.

Prerequisite: CEE 3030. Design and testing of high-strength PCC, self-consolidating PCC, high volume fly ash PCC and pervious PCC. Controlled low-strength materials. Concrete formwork design. Masonry materials evaluation. Aggregate production and improvement.
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CEE 4630 (5630). Traffic Engineering. Lec. 3. Credit 3. Prerequisite: CEE 3610. Techniques of traffic engineering measurements, investigations, and data analysis; design, application, and operation of traffic control systems and devices.

CEE 4640 (5640). Highway Engineering. Lec. 3. Credit 3. Prerequisite: CEE 3610. Theory and practice of highway geometric design, highway plans, construction practices, and computer applications to highway design.


CEE 4800. Geotechnical Engineering I. Lec. 3. Credit 3. Prerequisite: CEE 3030 and GEOL 3210. Soil physical properties, classification, permeability and seepage, consolidation, design, and analysis of foundations.

CEE 4920. Professionalism and Ethics. Lec. 1. Credit 1. Prerequisite: Senior standing. A discussion of the ethical, social, and economic considerations in engineering practice, and professional and technical societies.

CEE (ME) 4930 (5930). Noise Control. Lec. 2. Lab. 2. Credit 3. Prerequisite: MATH 2120 and PHYS 2110. Identification and description of noise sources and noise radiation, methods of noise measurements and criteria for noise levels, principles, and techniques of noise control.


CEE 4950. Senior Design Project. Lab. 6. Credit 3. Prerequisite: Senior standing. Comprehensive design project of civil engineering projects using a team approach.

CEE 4990 (5990). Special Problems. Credit 1 to 4 per semester. Maximum 18. Prerequisite: Approval of Departmental Chairperson. Current topics in the student's area of interest. May not be repeated to improve a grade.

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College of Arts and Sciences (CAS)

CAS 4910. Internship in Technology and Community Development I. Lab. 2. Credit 1. Prerequisite: Junior standing or above. From media tutorials (CD-ROM, videotape, etc.), personal tutorials, and workshops, the student learns at least three state-of-the-art applications of current computer technologies to community development projects. Student must sign a written intention to complete CAS 4910, CAS 4920, and CAS 4930. A-F grading.

CAS 4920. Internship in Technology and Community Development II. Lab. 4. Credit 2-3. Prerequisite: CAS 4910 or consent of the supervisor. The student collaborates with others in a workshop setting to practice at least three state-of-the-art applications of current computer technologies to community development projects. A-F grading.

CAS 4930. Internship in Technology and Community Development III. Lab. 4-6. Credit 2-3. Prerequisite: CAS 4910 and CAS 4920 or consent of the supervisor. The student completes a community development project, or a substantial, definable part of a project, based on at least three state-of-the-art applications of current computer technologies. A-F grading.

Computer Science (CSC)

CSC (MATH) (PHYS) 1020. First-Year Connections. Rec. 2. Credit 1. Prerequisite: Freshman Standing. This course is intended as a bridge course for students entering TTU from high school. The course is designed to strengthen the student’s connection to TTU, and the appropriate department (CSC, MATH, or PHYS) by focusing on the enhancement of skills needed for academic success. This course engages the student in meaningful academic and non-academic out-of-the-classroom activities, as learning occurs both in and out of the classroom. It emphasizes critical thinking, the formation of academic and social goals and support groups, and time-management and study skills.

CSC 1070. Elementary Programming. Lec. 3. Credit 3. Prerequisite: MATH 1010, MATH 1130, MATH 1530, MATH 1710, MATH 1720, MATH 1830, or MATH 1910. Introduction to programming including loops, arrays and applications in various disciplines. Prerequisite course may be taken concurrently.

CSC 1100. Introduction to Computing. Lec. 3. Credit 3. Credit cannot be obtained for CSC 1100 in addition to credit for either DS 2810 or FOED 3240. Use of software for word processing, spreadsheets, database, etc., on a personal computer; organization of computer hardware. (For non-computer science majors only.)

CSC 1610. Discrete Structures for Computer Science. Lec. 3. Credit 3. Prerequisite: ACT mathematics score of 25 or above, MATH 1130, MATH 1710, MATH 1720, MATH 1730, MATH 1830, or MATH 1910. Applications of discrete mathematics to computer
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science, sets and boolean algebra, relations, and graphs, with
applications to computer logic and data structures.

Prerequisite: MATH 1130, MATH 1710, MATH 1720, MATH 1730, MATH 1830, or MATH 1910. Corequisite: CSC 2101.
Digital computers; problem solving and algorithm development; programming is introduced using a procedural approach, but
classes and object-orientation are introduced; design and testing are emphasized. Prerequisite courses may be taken concurrently.

Corequisite: CSC 2100. A series of weekly laboratory exercises for developing proficiency in problem solving and computer programming.

Prerequisite: C or better in CSC 2100, CSC 2101, and CSC 1610. Corequisite: CSC 2111. Abstract data types and fundamental data structures including stacks, queues, and
trees; algorithms to search, sort, and manipulate data using such structures; and introduction to runtime analysis. CSC 1610 may be taken concurrently.

Prerequisite: C or better in CSC 2100, CSC 2101 and CSC 1610 Corequisite: CSC 2110. A series of weekly laboratory exercises for developing proficiency in implementing and utilizing data structures. CSC 1610 may be taken concurrently.

CSC 2120. Object-Oriented Programming and Design.  Lec. 3. Credit 3.
Prerequisite: C or better in CSC 2110 and CSC 2111. Corequisite: CSC 2121. Theory and practice of object-oriented programming and design. Encapsulation, inheritance, dynamic binding, and polymorphism; and introduction to UML and design patterns.

Prerequisite: C or better in CSC 2110 and CSC 2111. Corequisite: CSC 2120. A series of weekly laboratory exercises for developing proficiency in object-oriented programming and design.

Prerequisite: C or better in CSC 1610, CSC 2110, CSC 2111; and MATH 1910. Advanced data structures and applications, problem solving strategies, heuristics, and complexity of algorithms. MATH 1920 may be taken concurrently.

Prerequisite: C or better in CSC 2110 and CSC 2111. Introduction to the facilities, tools, and development procedures in an environment designed for systems programming. Prerequisites may be taken concurrently.

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Course provides an introduction to contemporary information technology and concepts of computing and information.

CSC 2560. Networks for Information Technologists.  Lec. 3. Credit 3.
Prerequisite: C or better in CSC 2500 and CSC 2550. Course covers theoretical and practical aspects of computer networks from an information technology perspective. CSC 2500 may be taken concurrently.

Prerequisite: C or better in CSC 1610, CSC 2110, CSC 2111. Application of discrete structures to model computational processes; techniques for analysis of algorithms; and automata and concepts of language theory. CSC 2110 and 211 may be taken concurrently.

CSC 2901, 2902, 2903. Special Topics.  Credit 1, 2, 3.
Prerequisite: Consent of instructor. Timely topics in computer science. Individual courses may not be repeated either for credit or for improvement of credit.

Prerequisite: MATH 1920, and C or better in CSC 2100 or ENGR 1120. Linear and non-linear equations; convergence and error analysis; quadrature; interpolation; numerical differentiation and integration; first order differential equations; boundary value problems; and approximation of functions.

Prerequisite: Junior standing and C or better in CSC 2110, CSC 2111. Required for all computer science majors, including transfer students. Written, oral, and audio-visual communication in computer science; presentation techniques, report preparation, and technical correspondence. Social, ethical, and career aspects of computing.

Prerequisite: C or better in CSC 2110 and CSC 2111. Development of web applications with client and server-side technologies.

Prerequisite: C or better in CSC 1610 and CSC 2100. Number systems and codes; Boolean algebra and logic gates; combinational logic MSI and LSI circuits; ROM; flip-flops; clocked sequential circuits; and logic design for counters, registers, and RAM.

Prerequisite: C or better in CSC 2110, CSC 2111; and MATH 2010. Formulation and application of the models of linear, non-linear, integer, and dynamic programming including computer solutions of the algorithms.
CSC 3350. Probabilistic Computer Models. Lec. 3 Credit 3.
Prerequisite: MATH 3470. Stochastic models of queuing, game, inventory, and decision theory with computer solutions in algorithmic form and by digital simulation.

CSC 3400. Distributed and Net-Centric Programming. Lec. 3. Credit 3.
Prerequisite: C or better in CSC 2400, CSC 2120, CSC 2121. Concepts in networking, operating systems, distributed computing, and programming languages. Application of these issues to web application design.

CSC 3402. Distributed and Net-Centric Programming for Engineers. Lec. 3. Credit 2.
Prerequisite: C or better in CSC 2400, CSC 2120, CSC 2121. Concepts in networking, operating systems, distributed computing, and programming languages. Credit cannot be earned for CSC 3402 in addition to credit for CSC 3400.

Prerequisite: C or better in CSC 2110, CSC 2111. Computer organization and architecture; machine language; and assembly language programming techniques.

Prerequisite: C or better in CSC 2500 and CSC 2560. Design of systems software; implementation of program development tools; development of a systems software package. Special permission to enroll can be obtained from department.

CSC 3560. Information Storage and Management. Lec. 3. Credit 3.
Prerequisite: C or better in CSC 2500 and CSC 2560. Course covers storage technologies, storage system architectures, storage networking technologies, business continuity and information availability principles and best practices, storage management and security principles and best practices.

Prerequisite: C or better in and CSC 2400, CSC 2120, CSC 2121. Introduction to life cycle/process models, software requirements analysis, software design, software testing and configuration management.

Prerequisite: MATH 2010 and C or better in CSC 2400. Interactive graphical techniques including three-dimensional transformations, hidden surface removal, texture mapping, and shading.

CSC 4010 (5010). Programming Languages. Lec. 3. Credit 3.
Prerequisite: C or better in CSC 2710 and CSC 3410. Concepts distinguishing modern programming languages with emphasis on language design, implementation, and run-time behavior.

CSC 4020 (5020). Compiler Construction. Lec. 3. Credit 3.
Prerequisite: C or better in CSC 2710 and CSC 3410. Programming language translator design with emphasis on design concepts, parsing, code generation, tools, and code improvement; and construction of a small compiler.

Prerequisite: C or better in CSC 2110, CSC 2111 and either C or better in CSC 3410 or ECE 3120. A historical perspective of operating systems; overview of modern systems; processor, storage, and process management; virtual memory; deadlocks; concurrent processing and programming; protection; and case studies.

Prerequisite: C or better in CSC 2400, CSC 2710 and CSC 2110, CSC 2111. Data communications and computer networks; network models and protocols; local area networks; and data security.

CSC 4240 (5240). Artificial Intelligence. Lec. 3. Credit 3.
Prerequisite: C or better in CSC 2400 and CSC 2710. A unified survey of AI methods and applications; search and problem solving; knowledge representation; methods of reasoning, planning and uncertainty; learning, perception and communication; and rational agents.

CSC 4300 (5300). Database Management Systems. Lec. 3. Credit 3.
Prerequisite: Junior standing and C or better in CSC 2110, CSC 2111. Organization and management of large data files; data definition; database models; query languages; crash recovery; concurrency control; and case studies.

Prerequisite: C or better in CSC 3410 or equivalent. Computer Systems, the CPU, the control unit, microprogramming, parallel organization, and RISC architectures.

Prerequisite: C or better in CSC 2400 and CSC 2710. Analysis techniques; search, traversal, string, and graph algorithms; and NP-hard and NP-complete problems.

Prerequisite: Junior standing and C or better in CSC 2110, CSC 2111. IAS fundamentals, IAS policies and models, access control, malicious codes, vulnerability analysis, network security, database security, program security, and basic cryptography.
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CSC 4610. Software Engineering I.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: C or better in CSC 2120, and CSC 2400 and senior standing. Course covers process models, agile methods, requirement analysis, design, testing, usability, configuration management and project management.

CSC 4620. Software Engineering II.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: C or better in CSC 4610. Course covers advanced agile methods, coding, advanced testing concepts, deployment and maintenance.

CSC 4710 (5710). Design and Development of Human and Web Interfaces.  
Lec. 3. Credit 3.  
Prerequisite: C or better in CSC 2110, CSC 2111, and CSC 3030. A course in human-computer interaction, design and use interface development. It will expose students to tools, techniques, and ideas for designing effective human computer interfaces and discuss practical and legal aspects of accessibility.

CSC 4801, 4802, 4803 (5801, 5802, 5803). Directed Readings in Computer Science.  
Credit 1, 2, 3.  
Prerequisite: Consent of instructor. This course provides for individual study under the direction of a faculty member in developing areas of computer science.

CSC 4901, 4902, 4903 (5901, 5902, 5903). Special Topics.  
Credit 1, 2, 3.  
Prerequisite: Consent of instructor. Timely topics in computer science. May be repeated for credit if the topic is different.

CSC 4950. Capstone Project.  
Lec. 3. Credit 3.  
Prerequisite: C or better in CSC 3700 or WEBD 4975. All graduating seniors are required to complete a capstone project during their senior year. This is a significant project that a student works on individually (under the guidance of a faculty member), which culminates in a portfolio review, scholarly paper (or technical report), and an oral presentation.

CSC 4951. Web Design Capstone Project Course.  
Lec. 3. Credit 3.  
Prerequisite: Senior standing and consent of instructor. This culminating project course is for students in the web design program. CSC students need to register for CSC 4950 and will not get credit for this course.

CSC 4990. Computer Science Internship.  
Credit 3 or 6.  
Prerequisite: Department approval, C or better in CSC 3030 and CSC 3550. Part-time employment in a professional or institutional situation related to the student's area of concentration in computer science. This course may be taken as two 3.hour courses or one 6.hour course. The 6.hour option will be approved in only very limited circumstances.

Cooperative Education (CO-OP)

COOP 2010. Co-op Off-Campus Assignments.  
Credit 1.  
Prerequisite: Approval by Office of Career Services and selection by employer. Each course represents one semester of off-campus work experience, practical learning, and training in the student's major field of study.

Credit 1.  
Prerequisite: Approval by Office of Career Services and selection by employer. Each course represents one semester of off-campus work experience, practical learning, and training in the student's major field of study.

COOP 2030. Co-op Off-Campus Assignments.  
Credit 1.  
Prerequisite: Approval by Office of Career Services and selection by employer. Each course represents one semester of off-campus work experience, practical learning, and training in the student's major field of study.

COOP 4010, 4020, 4030 (and when approved 4040). Co-op Off-Campus Assignments (Students on second year work assignments).  
Credit 1.  
Prerequisite: Completion of three semesters of successful work experience, approval by Office of Career Services, and selection by employer. The 4000.series allows students to demonstrate more initiative and creativity and to accept more responsibility.

Criminal Justice (CJ)

CJ (SOC) 2660. Criminology.  
Lec. 3. Credit 3.  
Prerequisite: Sophomore standing. Crime, the criminal and society's responses to the behavior.

CJ 2700. Introduction to Law Enforcement.  
Lec. 3. Credit 3.  
Introduction to contemporary police organization and operations.

Lec. 3. Credit 3.  
Substantive criminal law and the rights of defendants to criminal charges.

Lec. 3. Credit 3.  
Prerequisite: CJ 2850. Rules and exceptions governing the admission and exclusion of evidence including such issues as relevancy, presumptions, and burden of proof.

CJ (WFS) 3500. Wildlife Law Enforcement.  
Lec. 3. Credit 3.  
State wildlife laws and practices used in their enforcement. Enrollment primarily restricted to WFS majors.

CJ 3610. Criminal Justice Administration.  
Lec. 3. Credit 3.  
Prerequisite: Sophomore standing and SOC 1010 or CJ 2660, SOC 2660. Administration of the criminal process with particular attention to recent U.S. Supreme Court decisions regarding the Fourth, Fifth, and Sixth Amendments.

CJ (SOC) 3650. Juvenile Delinquency.  
Lec. 3. Credit 3.  
Prerequisite: Sophomore standing and SOC 1010. Causes of juvenile misconduct, possible responses to the problem, and
the system of juvenile justice.

**CJ (SOC) 4010 (5010). Organized Crime.**

Lec. 3. Credit 3.
Prerequisite: Sophomore standing and SOC 1010 or CJ 2660 or SOC 2660. Organized crime in America as a product of legal, historical, cultural, and economic forces.

**CJ (ANTH) (SOC) 4040 (5040). Law and Culture.**

Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. A comparative cross-cultural analysis of primitive, traditional, and modern attitudes toward law, social control, punishment, and individual responsibility.

**CJ (SOC) 4050 (5050). Criminal Justice Internship.**

Lec. 3. Credit 3.
Prerequisite: Sophomore standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Internship in criminal justice. May be taken twice, provided that the topic is different.

**CJ (SOC) 4051 (5051). Internship.**

Lec. 3. Credit 1-3.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. May be taken twice, provided that the topic is different.

**CJ (SW) 4090 (5090). Internship.**

Lec. 3. Credit 1, 2, 3.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in criminology or criminal justice.

**CJ (SOC) (SW) 4900 (5900). Internship in Criminal Justice.**

Credit 3.
Prerequisite: Nine hours of criminal justice. See instructor prior to enrolling. Students are placed with and work in a public or private agency which is compatible with their interests. (May be taken once for upper division credit to fulfill major or minor requirements and a second time as a general elective.)

**CJ (SOC) (SW) 4915. Internship.**

Credit 6.
Prerequisite: Nine hours of sociology. Six hour internships are only available for internships that offer special opportunities that are not available in a 3 hour internship. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 6 hours of credit.

**CJ (SOC) (SW) 4925. Internship.**

Credit 9.
Prerequisite: Nine hours of sociology. Nine hour internships are only available for internships that offer special opportunities that are not available in a 3 or 6 hour internship. The great majority of these will be summer internships that require the intern to work a 40 hour week. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 9 hours of credit.

**CJ (SOC) (SW) 4940. Independent Study.**

Credit 1
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

**CJ (SOC) (SW) 4970, 4980, 4990. (5970, 5980, 5990). Special Topics.**

Credit 1, 2, 3.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in criminology or criminal justice.

**Curriculum Education (CUED)**

**CUED 4100. Introduction to Curriculum.**

Lec. 3. Credit 3.
Principles for the selection, organization and evaluation of objectives and learning activities for the curriculum K-12.

**CUED 4120 (5120). Materials and Methods for Teaching Speech and Theatre.**

Lec. 3. Credit 3.
Prerequisite: Full admission to the second level. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of speech and elementary and secondary school teaching of theatre.

**CUED 4150. Middle Level Curriculum.**

Lec. 3. Credit 3.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: For SEED majors only FOED 3830. An examination of the philosophy, organization, and curriculum of middle level education, including career awareness and exploration, interdisciplinary team teaching, principles of classroom management, and family involvement in the schools.

**CUED 4850 (5850). Workshop in Education.**

Credit 1-6.

**CUED 4851, 4852, 4853. Workshop in Education.**

Credit 1, 2, 3.
The course will provide up-to-date content in emerging educational issues for inservice teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered. May be repeated for credit if the topic is different.

**Decision Sciences (DS)**

Enrollment in junior- or senior-level DS courses requires junior standing. All business majors must have completed the Basic
DS 1810. Governor's School for Information Technology Leadership.  
Lec. 3. Credit 3.  
Prerequisite: Enrollment is restricted to Governor's School for IT Leadership participants. The course will introduce students to the principles, problems, and practices in business leadership. The focus of the class will be on the students developing a business plan for an information technology based company.

DS 2810. Computer Applications in Business.  
Lec. 3. Credit 3.  
Management approach to business applications of computer technology. Microcomputers and large scale computers are used in problem solving. Credit cannot be obtained for CSC 1100 in addition to credit for either DS 2810 or FOED 3240.

DS 3520. Operations Management.  
Lec. 3. Credit 3.  
Prerequisite: ECON 3610. Management of the processes, resources, and technologies in the production of goods and services.

Lec. 3. Credit 3.  
Prerequisite: DS 3520 or consent of instructor. Contemporary issues in quality and productivity management are examined.

DS 3620. Management Science.  
Lec. 3. Credit 3.  
Prerequisite: ECON 3610. Applications of management science methods to business problem solving.

DS 3810. Business Applications of Microcomputers.  
Lec. 3. Credit 3.  
Prerequisite: DS 2810 or consent of instructor. Cost benefit considerations and development and implementation of microcomputer-based business applications are emphasized.

DS 3830. COBOL Programming for Business.  
Lec. 3. Credit 3.  
Prerequisite: DS 2810 or consent of instructor. COBOL programming and charting methods. Each student is required to program a number of business management problems.

DS 3840. Management Information Systems.  
Lec. 3. Credit 3.  
Prerequisite: DS 2810. Management information needs and the technical, economic, and organizational impacts of these needs. Accounting majors must enroll in DS 3840. All other students must enroll in DS 3841.

DS 3841. Management Information Systems.  
Lec. 3. Credit 3.  
Prerequisite: DS 2810. Management information needs and the technical, economic, and organizational impacts of these needs. Accounting majors must enroll in DS 3840. All other students must enroll in DS 3841.

Lec. 3. Credit 3.  
Prerequisite: DS 2810. Introduction to software development of business oriented applications including control structures, memory structures, and database-oriented applications.

DS 3860. Business Database Management.  
Lec. 3. Credit 3.  
Prerequisite: DS 3850 or consent of instructor. Issues and concepts related to designing and managing computerized business databases; emphasis on functional area applications using mini and microcomputer data management software.

Lec. 3. Credit 3.  
Prerequisite: DS 3850. Develop Internet-based database applications for business.

Lec. 3. Credit 3.  
Prerequisite: DS 3860 or consent of instructor. A current study of DSS concepts, designs, methodologies, and business applications, including expert systems.

DS 4125. Computer Forensics and Investigations.  
Lec. 3. Credit 3.  
Prerequisite: Consent of instructor. Investigation, discovery, and analysis of digital computer evidence. Student work groups use computer hardware and forensic software to perform computer forensic investigations and solve sample cases. Students are introduced to and work with numerous computer forensic tools.

DS 4250. Business Data Communications.  
Lec. 3. Credit 3.  
Prerequisite: DS 3850 or consent of instructor. Concepts and management of data and voice communications for supporting business activities to include local and wide area networks.

Lec. 3. Credit 3.  
Prerequisite: DS 4250 or consent of instructor. Concepts of network security measures aimed at preventing unwanted access to a network and network forensics aimed at capturing and inspecting network traffic for later analysis.

Lec. 3. Credit 3.  
Prerequisite: DS 3841 and DS 3860. An applications oriented study of the business systems development life cycle and current systems analysis and design methods are emphasized.

DS 4550. Information Systems Development Practicum.  
Lec. 3. Credit 3.  
Prerequisite: DS 3870, DS 4250, and DS 4330 (5330). Students develop their knowledge and skills in planning, analyzing, designing, and implementing real-world information systems.

DS 4630 (5630). Advanced Quantitative Analysis.  
Lec. 3. Credit 3.  
Prerequisite: DS 3620. Advanced applications of quantitative methods, including forecasting and management science concepts.
DS 4900 (5900). Special Topics in Decision Sciences.  
Lec. 1-3. Credit 1-3.  
Prerequisite: Consent of instructor. Current topics in decision sciences.

DS 5050. Quantitative Techniques for Business.  
Lec. 3. Credit 3.  
Classical and modern optimization techniques and concepts. Basic review and introduction to business applications of probability, statistics, and management science methods.

Early Childhood Education (ECED)

ECED (ECSP) 3001. Curriculum for Infants, Toddlers & Preschoolers.  
Lec. 3. Credit 3.  
Prerequisite: HEC 2200. Survey of developmentally appropriate curricula for young children through age five with emphasis on creative activities, books and materials, toys, teacher-made resources, and software and specialized curricula for children with special needs.

ECED (ECSP) 3200. Procedures for Infants, Toddlers & Preschoolers.  
Lec. 3. Credit 3.  
Prerequisite: HEC 2200, CFS 2400, and ECED 3001 or the equivalents. Corequisite: ECED 3211 or ECSP 3211. Planning and implementing developmentally appropriate practices for typically and atypically developing infants, toddlers, and preschoolers, including procedures for working with their families.

ECED (ECSP) 3211. Practicum: Procedures for Infants, Toddlers & Preschoolers.  
Lab. 8. Credit 1.  
Prerequisite: HEC 2200, CFS 2400, and ECED 3001 or the equivalents. Corequisite: ECED 3200 or ECSP 3200. Supervised teaching and intervening with infants, toddlers, and preschoolers and their families in varied educational settings.

Lec. 4. Credit 3.  
Corequisite: ECED 3310, READ 3311, and FOED 3810. Full admission to the Teacher Education Program. Developmentally appropriate materials and methods for integrated learning experiences in mathematics, science and social studies. Focus is on diverse and inclusive populations ages B-9.

ECED 3310. Practicum: Concepts for Young Children.  
Lab. 4. Credit 1.  
Corequisite: ECED 3300 and READ 3311. Full admission to the Teacher Education Program. Supervised teaching of integrated learning experiences in appropriate settings for preschooler-Grade 4 students.

Lec. 3. Lab. 3. Credit 3.  
Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECED 4100. Integrated learning experiences with emphasis on approaches, teaching strategies, and management.

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Lec. 2. Lab. 4. Credit 3.  

Lec. 2. Credit 2.  
Prerequisite: Full admission to the second level. Corequisite: ECED 4220. Objectives, curriculum, materials, principles of teaching, and physical facilities for young children.

ECED 4220 (5220). Early Childhood Education, Practicum II.  
Lab. 10. Credit 3.  
Prerequisite: Full admission to the second level and ECED 2850. Corequisite: ECED 4210 (5210). Participation with children in kindergarten setting. Use of teacher-made materials, units, and innovative methods.

ECED 4250 (5250). Language Arts and Communication Skills.  
Lec. 2. Credit 2.  
Prerequisite: Full admission to the second level. Relationship of language development and thinking to teaching communication skills to children.

ECED (ECSP) 4300 (5300). Assessment of Young Children.  
Lec. 3. Credit 3.  
Prerequisite: CFS 2400, CFS 2410, or consent of instructor. Theories, principles, and practices associated with child find, assessment, and evaluation of young children, their families, and their environments.

ECED (LSCI) 4530 (5530). Books and Related Materials for Infants and Toddlers.  
Lec. 1. Credit 1.  
Survey of developmentally appropriate books and materials for infants, toddlers, and preschoolers.

ECED 4840 (5840). Seminar: Language Acquisition from Birth to Five Years.  
Lec. 1. Credit 1.  
Prerequisite/Corequisite: ECED 4250. Study of early language development, problems and acquisition in children from birth to five years of age.

ECED (ECSP) 4870. Student Teaching I.  
Credit 5.  
Corequisite: ECED 4880 and ECED 4890. Activities directly related to teaching performance, planning and presenting lessons, directing study, and managing the classroom.

ECED (ECSP) 4880. Student Teaching II.  
Credit 5.  
Corequisite: ECED 4870 and ECED 4890. Continuation of ECED 4870 in a different setting.

ECED 4890. Student Teaching Seminar.  
Credit 2.  
Corequisite: ECED 4870 and ECED 4880. Seminar on issues of student teaching with special emphasis on classroom management.
Early Childhood Special Education (ECSP)

Lec. 3. Credit 3.  

Lab. 4. Credit 1.  
Corequisite: ECSP 2400. Supervised participation in service delivery settings.

ECSP (ECED) 3001. Curriculum for Infants, Toddlers & Preschoolers.  
Lec. 3. Credit 3.  
Prerequisite: Admission to the Teacher Education Program, HEC 2200. Survey of developmentally appropriate curricula for young children through age five with emphasis on creative activities, books and materials, toys, teacher-made resources, software, and specialized curricula for children with special needs.

ECSP (ECED) 3200. Procedures for Infants, Toddlers & Preschoolers.  
Lec. 3. Credit 3.  
Prerequisite: HEC 2200, CFS 2400, and ECED 3001 or the equivalents. Corequisite: ECSP 3211 or ECED 3211. Planning and implementing developmentally appropriate practices for typically and atypically developing infants, toddlers, and preschoolers, including procedures for working with their families.

ECSP (ECED) 3211. Practicum: Procedures for Infants, Toddlers & Preschoolers.  
Lab. 1. Credit 1.  
Prerequisite: HEC 2200, CFS 2400, and ECED 3001 or the equivalents. Corequisite: ECSP 3200 or ECED 3200. Supervised teaching and intervening with infants, toddlers, and preschoolers and their families in varied educational settings.

Lec. 3. Lab. 3. Credit 3.  
Prerequisite: Full admission to the Teacher Education Program. Corequisite: ECSP 4100. Integrated learning experiences with emphasis on approaches, teaching strategies, and management.

Lec. 2. Lab. 4. Credit 3.  

ECSP (ECED) 4300 (5300). Assessment of Young Children.  
Lec. 3. Credit 3.  
Prerequisite: Admission to the Teacher Education Program, CFS 2400, CFS 2410, or consent of instructor. Theories, principles and practices associated with child find, assessment, and evaluation of young children, their families, and their environments.

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ECSP (ECED) 4870. Student Teaching I.  
Credit 5.  
Corequisite: ECSP 4880 and ECSP 4890. Activities directly related to teaching performance, planning and presenting lessons, directing study, and managing the classroom.

ECSP (ECED) 4880. Student Teaching II.  
Credit 5.  
Corequisite: ECSP 4870 and ECSP 4890. Continuation of ECSP 4870 in a different setting.

ECSP (CFS) 4890. Seminar: Student Teaching/Internship.  
Lec. 2. Credit 2.  
Examination of important professional topics, including a personal and professional profile, a portfolio, a resume, professional behavior, and professional organizations. Analysis of personal and professional resources.

Economics (ECON)

Enrollment in junior- and senior-level ECON courses requires junior standing. All business majors must have completed the Basic Business Program.

Lec. 3. Credit 3.  
Supply and demand, theory of demand, principles of production, pricing, and distribution. Output market structures, labor markets and issues, and international trade.

Lec. 3. Credit 3.  
Aggregate supply and aggregate demand, employment and income determination, money and banking, monetary and fiscal policy, and international finance.

ECON 3320. Money and Banking.  
Lec. 3. Credit 3.  
Prerequisite: ECON 2020. Principles of money, banking, and the financial system; the impact of money on economic activity.

ECON 3610. Business Statistics I.  
Lec. 3. Credit 3.  
Prerequisite: MATH 1830 or consent of instructor. Statistical description, probability, probability distributions (binomial, normal, and t), sampling distributions, hypothesis testing, chi-square and F-distributions, and linear regression.

ECON 3630. Business Statistics II.  
Lec. 3. Credit 3.  
Prerequisite: ECON 3610. Hypothesis testing, multiple regression, other multivariate techniques, time series analysis and forecasting, and decision-making under uncertainty.

ECON 3810. Intermediate Microeconomics.  
Lec. 3. Credit 3.  
Prerequisite: ECON 3610. Microeconomic analysis at the intermediate level; consumer behavior, firm production theory, pricing, and industrial organization.

ECON 3820. Intermediate Macroeconomics.  
Lec. 3. Credit 3.  
**ECON 3830. Managerial Economics.** Lec. 3. Credit 3. 
Prerequisite: ECON 2010 and ECON 3610. Theory and estimation of demand, production, and costs. Pricing and output decisions under different market structures, financial investment, government and business, and international business.

**ECON 4310 (5310). Labor Economics.** Lec. 3. Credit 3. 
Prerequisite: ECON 2010, ECON 2020, and one of ECON 3320, ECON 3810, or ECON 3820. Labor problems including economics of the labor market, wages, demand and supply of labor, and unemployment.

**ECON (FIN) 4510 (5510). International Trade and Finance.** Lec. 3. Credit 3. 
Prerequisite: ECON 2010, ECON 2020, and one of ECON 3320, ECON 3810, or ECON 3820. International trade, monetary exchange, balance of payments, and foreign investments.

**ECON 4520 (5520). Comparative Economic Systems.** Lec. 3. Credit 3. 
Prerequisite: ECON 2020. Analysis of essential economic features of the economic systems.

**ECON 4530 (5530). History of Economic Thought.** Lec. 3. Credit 3. 
Prerequisite: ECON 2020. Development of economic doctrines and schools and economic thought from the mercantilist period to the present.

**ECON 4600 (5600). Economic Growth and Development.** Lec. 3. Credit 3. 
Prerequisite: ECON 2020. A critical survey of growth and strategies of economic development, including regional growth and development; historical evidence of development.

**ECON 4640 (5640). Econometrics.** Lec. 3. Credit 3. 
Prerequisite: ECON 2010, ECON 2020, ECON 3610, and one of ECON 3320, ECON 3810, or ECON 3820. An advanced treatment of statistical models applied to economics, including the general linear model, heteroscedasticity, autocorrelation, multi-collinearity, simultaneous equations, and other violations of OLS assumptions.

**ECON 4900 (5900). Contemporary Economics Workshop.** Credit 1 to 6. 
Thorough and intensive training of public school teachers in fundamental economic principles and current issues. May not be counted as part of a degree program in the College of Business.

**ECON 5030. Fundamentals of Economics.** Lec. 3. Credit 3. 
Production and distribution of wealth and income and other basic principles of the market economy.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

**Educational Psychology (EDPY)**

**EDPY 2200. Educational Psychology.** Lec. 3. Credit 3. 
Human growth and learning, nature of the learning process, factors that affect the learner, and application of psychological principles to teaching.

**EDPY 3300. Evaluation and Guidance.** Lec. 3. Credit 3. 
Prerequisite: Full admission to the second level. Major types of evaluation procedures, construction of evaluative instruments, and functions of the classroom teacher in evaluation.

**Electrical and Computer Engineering (ECE)**

**ECE 2000. Introduction to Electrical and Computer Engineering.** Lec. 1. Lab. 3. Credit 2. 
Prerequisite: MATH 1920 and ECE 2010. Principles and practices of various areas of electrical and computer engineering. Introduction to matrices, complex numbers, MATLAB software, and other elementary topics relevant to electrical engineering. Introduction to electrical system design. ECE 2010 can be taken concurrently.

**ECE 2010. Electric Circuits I.** Lec. 3. Credit 3. 
Prerequisite: MATH 1920, MATH 2120 (MATH 2120 may be taken concurrently). Introduction to electric circuit quantities and components, systematic application of Ohm’s and Kirchhoff’s laws, superposition, Thévenin and Norton theorems, operational amplifiers, RL and RC transients, and circuit simulation with SPICE.

**ECE 2011. Electrical Engineering Laboratory I.** Lab. 3. Credit 1. 
Prerequisite: ECE 2020. Basic instrumentation and component laboratory. Use of instruments in dc and ac measurements. Demonstration of circuit concepts. Characteristics of diodes and transistors. ECE 2020 can be taken concurrently.

Prerequisite: ECE 2010 and MATH 2120. Laplace transform methods for electric circuit analysis. Sinusoidal steady-state and power, mutual inductance, 3. phase circuits, frequency response, Bode plots, resonance, and filters. Circuit simulation with SPICE.

**ECE 2060. Measurements Laboratory.** Lab. 3. Credit 1. 
Prerequisite: ECE 2020. Basic instrumentation and component laboratory. Use of instruments in dc and ac measurements. Demonstration of circuit concepts. Characteristics of diodes and transistors. ECE 2020 can be taken concurrently.

**ECE 2110. Introduction to Digital Systems.** Lec. 3. Credit 3. 
Prerequisite: Sophomore standing. Basic concepts in the design and analysis of digital systems. Number systems and codes. Combinational circuit analysis and design using Boolean algebra. Sequential logic circuit analysis and design.
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ECE 3010. Signals and Systems. Lec. 3. Credit 3.
Prerequisite: ECE 2010 and MATH 2120. Time-domain and frequency-domain analysis of signals and systems, applications of Fourier series, Fourier transform, and Laplace transform in circuits and systems; Analog filters.


ECE 3060. Electrical Engineering Laboratory II. Lab. 3. Credit 1.
Prerequisite: ECE 2011, ECE 2020, ECE 3010 and ECE 3300. (ECE 2020, ECE 3010 and/or ECE 3300 may be taken concurrently.) Electrical and electronic circuits and measurement techniques, amplifiers, active and passive filters, switching circuits.

Prerequisite: ECE 2110 and CSC 2100. Architecture and programming of microcomputer systems and interfacing with peripherals.

ECE 3160. Digital Systems Laboratory. Lab. 3. Credit 1.
Prerequisite: ECE 2011 and ECE 2110. Hardware considerations and performance of combinational and sequential digital devices including gates, flip-flops, multiplexers, and decoders.

ECE 3210. Control System Analysis. Lec. 3. Credit 3.
Prerequisite: ECE 3010 and PHYS 2110. Modern and classical methods of control system analysis of continuous-time systems. Introduction to design tools.

ECE 3260. Control System Laboratory. Lab. 3. Credit 1.
Prerequisite: ECE 3060 and ECE 3210. (ECE 3210 may be taken concurrently.) Simulation of dynamic systems. Demonstration of control system analysis and design techniques using hardware experiments.

ECE 3270. Programmable Logic Controller Laboratory. Lab. 3. Credit 1.
Prerequisite: ECE 2020, ECE 3060, and ECE 2110. Introduction to Ladder Logic Programming, Relays, PLC in Automation & Control, Safety, Hardware Troubleshooting, Hands-on laboratory experiments and projects.

ECE 3300. Electronics I. Lec. 3. Credit 3.
Prerequisite: ECE 2020. Introduction to semiconductor junction devices, their physical operation and low frequency equivalent circuits, and single and multi-stage amplifiers, including differential amplifiers.

ECE 3310. Electronics II. Lec. 3. Credit 3.
Prerequisite: ECE 3300. Power amplifiers, frequency response of amplifiers, feedback amplifiers, oscillators, and selected analog building blocks.

ECE 3320. Digital Electronics. Lec. 3. Credit 3.
Prerequisite: ECE 2110 and ECE 3300. Analysis and design of discrete and integrated digital electronic gates and circuits at the transistor level in MOS and bipolar technologies. Introduction to layout and fabrication of digital circuits. Circuit simulation using CAD tools.

ECE 3360. Electronics Laboratory. Lab. 3. Credit 1.
Prerequisite: ECE 3060 and ECE 3300. Diodes, BJTs, FETs, and amplifier circuits.

ECE 3510. Electromagnetic Fields I. Lec. 3. Credit 3.
Prerequisite: MATH 2110 and PHYS 2120. Development of Maxwell's equations for electric and magnetic fields. Electromagnetic properties of materials. Wave equation, plane waves, and Lorentz force law.

ECE 3540. Physical Electronics. Lec. 3. Credit 3.
Prerequisite: PHYS 2120. Quantum and wave theory in metals and semiconductors, carrier density, and current relations. Models for basic semiconductor devices.

ECE 3560. EM Simulation Laboratory. Lab. 3. Credit 1.
Prerequisite: ECE 3060 and ECE 3510. Simulation and design of phenomena and devices with EM fields and waves.

ECE 3610. Introduction to Power Systems. Lec. 3. Credit 3.
Prerequisite: ECE 2020 and PHYS 2120. Overview of electric power systems, magnetic circuits and transformers, electromechanical energy conversion, rotating machines, power system operation and control, and current issues in power systems.

ECE 3660. Electric Power Laboratory. Lab. 3. Credit 1.
Prerequisite: ECE 3060 and ECE 3610. Operation of various power system components, design tests of transformers, speed control characteristics of various types of motors and generators, and computer simulation of power system operation.

ECE 3710. Introduction to Telecommunications. Lec. 3. Credit 3.
Prerequisite: ECE 2020 and PHYS 2120. Introduction to Digital Telecommunications, including coding, communication networks, spectral analysis, and digital modulation and demodulation. ECE 3910 can be taken concurrently.

ECE 3760. Telecommunications Laboratory. Lab. 3. Credit 1.
Prerequisite: ECE 3060 and ECE 3710. Telecommunication system measurements.

Prerequisite: MATH 2120. An introduction to fundamental principles of electrical circuits, DC and AC circuit analysis techniques, electric power systems, electric motors, diodes and rectifiers, operational amplifiers, frequency response and filters. Will not count for credit for electrical engineering or computer engineering majors.
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Prerequisite: ECE 3810. Basic instrumentation and component laboratory. Use of instruments in DC and AC measurements. Demonstration of circuit concepts. Characteristics of diodes, operational amplifiers and AC filters. Simple digital logic circuits. Will not count for credit for electrical engineering or computer engineering majors. ECE 3810 can be taken concurrently.

ECE 3910. Probability and Random Variables in Electrical and Computer Engineering. Lec. 3. Credit 3.
Prerequisite: MATH 2110 and ECE 2010. Introduction to statistical analysis of engineering data. Random experiments, probability, and reliability. Random variables, distributions, densities, expectation, and transformations. Applications to Electrical and Computer Engineering.

Prerequisite: ECE 3020 and ECE 3120. (ECE 3120 may be taken concurrently.) Introduction to the discrete-time signals and systems, A/D and D/A conversion, filter design, DSP architecture and implementation, programming, DSP applications.

Prerequisite: ECE 3010, ECE 3310, and ECE 3360. Characteristics of operational amplifiers. Introduction to active filters including sensitivity analysis. Some non-linear applications of operational amplifiers.

ECE 4110 (5110). Sequential Logic Design. Lec. 3. Credit 3.
Prerequisite: ECE 2110 and ECE 3160. Introduction to sequential digital logic analysis, design and applications, utilizing both standard digital components and programmable logic devices.

Prerequisite: ECE 3120 and ECE 4110 (5110). Continuation of digital system design concepts and applications with emphasis on computer hardware design: CPU sequencers, arithmetic/logic units, fixed and floating point arithmetic implementations, and computer peripheral interfacing, utilizing programmable logic.

ECE 4130 (5130). Introduction to Digital VLSI. Lec. 2. Lab. 3. Credit 3.
Prerequisite: ECE 3320 and ECE 4110 (5110). Analysis, design and layout of complex digital integrated circuits in MOS technology. The course emphasizes design through projects and requires extensive use of simulation and layout VLSI CAD tools.

Prerequisite: ECE 3120, ECE 3160, and CSC 2100. Basic hardware and software concepts in the analysis and design of embedded systems, peripheral interfaces and performance analysis with hands-on design project.

ECE 4210 (5210). Control System Design I. Lec. 3. Credit 3.
Prerequisite: ECE 3210 and ECE 3260. Design of compensators using frequency domain techniques; Design projects with hardware implementation.

ECE 4220 (5220). Control System Design II. Lec. 3. Credit 3.
Prerequisite: ECE 4210 (5210). Discrete-time systems theory and analysis and design of discrete-time control systems.

Prerequisite: ECE 4210 (5210) or consent of instructor. Computer-based control systems, analysis, and design of computer-based measurement and data acquisition systems and virtual instrumentation.

Prerequisite: ECE 3310. Design, layout generation, simulation, and verification of CMOS analog building blocks, such as operational amplifiers, operational transconductance amplifiers, current conveyers, and mixed signal circuits; system design using building blocks.

ECE (ME) 4370 (5370). Mechatronics and Intelligent Machines Engineering. Lec. 2. Lab. 2. Credit 3.
Prerequisite: ECE 3120 and ECE 3160. Mechatronics; number systems; microcontroller technology and architecture of 8-bit microcontrollers (e.g. Motorola MC68HC110); assembly language programming; A/D and D/A conversion; parallel I/O; programmable timer operation; interfacing sensors and actuators; applications; and team project on design and implementation of a mechatronic system.

ECE 4510 (5510). Electromagnetic Fields II. Lec. 3. Credit 3.
Prerequisite: ECE 3510. Polarization, Poynting’s vector, transmission lines, waveguides, and radiation.

ECE 4520 (5520). Optoelectronic Engineering. Lec. 3. Credit 3.
Prerequisite: ECE 3540. Device theory for optical communication and instrumentation systems.

ECE 4570 (5570). Introduction to Gaseous Electronics. Lec. 3. Credit 3.
Prerequisite: ECE 3540. Physical and mathematical concepts of gas discharge devices like phototubes, gas lasers, switchgear, and MHD. Discussion of different criteria for a self-sustaining electrical discharge in a gas.

Prerequisite: ECE 3610. Power system components modeling in steady state, per unit calculations, power flow analysis, applications of commercial software.

Prerequisite: ECE 4610 (5610). Symmetrical components, fault analysis, system protection, power system controls including: automatic generation control, voltage regulation, and economic
ECE 4630 (5630). Power Electronics.  Lec. 3. Credit 3.  
Prerequisite: ECE 3300 and ECE 3610. Uncontrolled and controlled rectifiers, voltage controllers, chopper, dc motor control, pulse-width modulation inverters, induction motor control, and power supplies.

Prerequisite: ECE 3710 and ECE 3910. Performance of analog and digital communication systems in the presence of noise.

Prerequisite: ECE 4710 (5710). Link budget, synchronization, frequency synthesis, receiver architecture, noise and distortion, error correction codes, spread-spectrum systems.

Prerequisite: MATH 2120, CHEM 1110, and PHYS 2110. Introduction to basic topics in the analysis and design of nuclear power plants.

Prerequisite: MATH 2120, CHEM 1110, PHYS 2110, and ECE 2020 or ECE 3810. Introduction to the basics of economics, environmental issues, analysis and design of a selected set of renewable energy systems.

Prerequisite: SPCH 2410 or PC 2500 and Junior or Senior Standing. Professional topics in engineering, verbal technical communications.

ECE 4930. Research and Design.  Credit 3.  
Prerequisite: Senior ECE standing and consent of instructor. Problems in the field of electrical engineering having considerable scope as a research and design problem. (Because of the impossibility of duplicating the conditions on special research and design problem(s), this course may not be repeated for improvement of a grade.)

Prerequisite: Senior standing in engineering or consent of instructor. Introduce the design, fabrication and performance of MEMS devices. Topics include bulk and surface micromachining, photolithography, sensors, actuation systems, optical MEMS, and microcantilever-based systems.

ECE 4960. Senior Capstone Design I.  Lec. 1. Lab. 3. Credit 2.  
Prerequisite: ECE 2060, ECE 2110, ECE 3010, ECE 3300, and ISE 3920. The first in a sequence of two senior capstone design project courses. Student teams will complete an industry client-driven system design project. Teamwork, leadership, project planning and management, specification, budgeting, design review, implementation, testing, weekly reporting, documentation, and oral presentation.

Prerequisite: ECE 3060, ECE 2110, ECE 3010, and ECE 3300, and ECE 4910. (ECE 4910 may be taken concurrently). The first is a sequence of two capstone design project courses. Student teams will complete an industry client-driven system design project. Teamwork, leadership, project planning and management, specification, budgeting, design review, implementation, testing, weekly reporting, documentation, and oral presentation.

Prerequisite: ECE 4961. The second in a sequence of two senior capstone design project courses. Student teams will complete an industry client-driven system design project. Teamwork, leadership, project planning and management, specification, budgeting, design review, implementation, testing, weekly reporting, documentation, and oral presentation.

ECE 4990 (5990). Special Problems.  Credit 1.6 Per Semester, Maximum 12.  
Prerequisite: Consent of instructor. Current topics in electrical engineering in the form of a reading course or an experimental lecture course. (Because of the impossibility of duplicating the conditions of a special topic(s), this course may not be repeated for the improvement of a grade.)

Elementary Education (ELED)

ELED 2100. Problem Solving for Technological Literacy.  Lec. 3. Credit 3.  
Prerequisite: FOED 2011 and FOED 1822 or FOED 1820. Course is designed to provide opportunities for preservice K-6 teachers to explore problems that arise naturally in the world and to develop their critical thinking and problem solving skills. This course will focus on the development of technological literacy among future educators. This course will encourage teachers to capitalize on students' natural curiosity about the world and how it works. Education and Engineering faculty will work in collaboration to develop and facilitate real-world problem solving experiences designed to develop a more technologically literate citizenry.

Prerequisite: Admission to the Teacher Education Program. Corequisite: FOED 3800. Current practices, research, innovations, and unit method are emphasized.


ELED 3151. Teaching of Language Arts and Writing.  Credit 2.  
Prerequisite: Full admission to the Teacher Education Program. Corequisite: ELED 3140, ELED 3152, ELED 4140.
While implementing the writing process, candidates will review, explore, and apply grammatical and mechanical aspects of writing in various genres, for different purposes and audiences, and across content areas.


ELED 3872. Professional Seminar I. Credit 5. Corequisite: ELED 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

ELED 4140. Science for Elementary Teachers. Lec. 2. Credit 2. Prerequisite: Admission to the Teacher Education Program. Curricula content of elementary school science including materials and methods of developing understanding and skills in science for children.

ELED 4250 (5250). Language Arts and Communication Skills. Lec. 2. Credit 2. Prerequisite: Full Admission to the Teacher Education Program. Relationship of language development and thinking to teaching communications skills to children in the middle grades.

ELED 4870. Student Teaching I. Credit 5. Prerequisite: The prerequisite to all upper-division education courses is full admission to the Teacher Education Program. Corequisite: ELED 4880 and ELED 4890. Activities directly related to teaching performance, planning and presenting lessons, directing study, and managing the classroom.

ELED 4871. Residency I. Credit 5. Corequisite: ELED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

ELED 4872. Professional Seminar I. Credit 5. Corequisite: ELED 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

ELED 4880. Student Teaching II. Credit 5. Prerequisite: The prerequisite to all upper-division education courses is full admission to the Teacher Education Program. Corequisite: ELED 4870 and ELED 4890. Continuation of ELED 4870 in a different setting.

ELED 4881. Residency II. Credit 10. Corequisite: ELED 4882. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.


ELED 4890. Seminar: Education and Society. Credit 2. Prerequisite: The prerequisite to all upper-division education courses is full admission to the Teacher Education Program. Corequisite: ELED 4870 and ELED 4880. Seminar on issues related to the interrelationships among school, culture, and society; a historical, philosophical, and sociological analysis.

Engineering (ENGR)

ENGR 1020. Connections to Engineering and Technology. Rec. 2. Credit 1. Prerequisite: Freshman Standing. Engages the student in meaningful academic and non-academic, out-of-the-classroom activities involving engineering and technology. Emphasizes critical thinking in the formation of academic and social goals and support groups and in self-management and study skills.


ENGR 1120. Programming for Engineers. Lec. and Lab. 4. Credit 2. Prerequisite: ENGR 1120. Programming for Engineers. ENGR 1120. Problem definition, algorithm development, flowcharting, and structured programming using a high level language. MATH 1730, MATH 1910 or MATH 1920 can be taken concurrently.

ENGR 1210. Introduction to Engineering. Lec. and Lab. 2. Credit 1. Introduction to engineering and engineering technology, the engineering problem solving method, introduction to design, basic problem solving and computer skills, study, and personal development skills.


ENGR 3951, 3952, 3953. Special Topics for Non-Engineers. Credit 1, 2, 3. Maximum 6.
Prerequisite: Consent of instructor. Timely topics in engineering and technology—the relationships to other professions. This course may not be used to earn credit toward an engineering degree.

Drug and Substance Abuse and Education (DUSA) 3900. Credit 3.
Prerequisite: Consent of instructor. Introduction to substance abuse and misuse. An inquiry into the nature of substance abuse, its impact on individuals and society, and the development, implementation, and evaluation of educational programs designed to prevent and reduce the negative consequences of substance abuse. (Same as PSY 3900.)

English (ENGL)

ENGL 1010 and ENGL 1020 and one course from among ENGL 2130, ENGL 2230, and ENGL 2330 are prerequisites for all upper division courses. The requirement for ENGL 2130, ENGL 2230, or ENGL 2330 is waived for ENG and SEEN majors.

◆ ENGL 1010. Writing I. Lec. 3. Credit 3.
Introduces students to expressive, expository and persuasive writing. Assignments are based on personal experience and research. Student must earn a grade of C or better to pass.

◆ ENGL 1020. Writing II. Lec. 3. Credit 3.
Prerequisite: ENGL 1010. Builds on writing and research processes taught in ENGL 1010; emphasizes critical reading, critical thinking, and critical writing (persuasion) about a variety of written texts and other media. Student must earn a grade of C or better to pass.

◆ ENGL 2130. American Literature. Lec. 3. Credit 3.
Prerequisite: ENGL 1020. Not for ENG or SEEN majors. Representative authors, periods, or themes from the colonial period to the present.

◆ ENGL 2230. British Literature. Lec. 3. Credit 3.
Prerequisite: ENGL 1020. Representative authors, periods, or themes from Old English through the eighteenth century.

◆ ENGL 2330. World Literature. Lec. 3. Credit 3.
Prerequisite: ENGL 1020. Not for ENG or SEEN majors. Representative authors, periods, or themes from various world literary cultures.

ENGL 3000. Introduction to English Methods and Research. Lec. 3. Credit 3.
Basic sources, research methodology, critical theory, and writing processes/formats needed by majors.

ENGL (PC) 3250. Professional Communication I. Lec. 3. Credit 3.
Prerequisite: ENGL 1020 The preparation of effective technical and professional reports and the preparation and delivery of effective oral reports. (Same as PC 3250.)

ENGL 3400. Introduction to Creative Writing. Lec. 3. Credit 3.
Prerequisite: At least a grade of C or better in one sophomore-level literature course (ENGL 2130, ENGL 2230, ENGL 2330) or a grade of C or better in ENGL 3810 or ENGL 3820 or ENGL 3910 or ENGL 3920. An introductory-level creative writing course in at least two genres: fiction, poetry, literary nonfiction, or drama. Genres to be determined by the instructor.

Greek and Roman myths in relation to modern life and literature.

ENGL 3810. British Literature I. Lec. 3. Credit 3.
A survey of British authors from Old English through the eighteenth century.

ENGL 3820. British Literature II. Lec. 3. Credit 3.
A survey of British authors from the Romantics to the present.

ENGL 3910. American Literature I. Lec. 3. Credit 3.
A survey of American writers from the colonial period through the mid-nineteenth century.

ENGL 3920. American Literature II. Lec. 3. Credit 3.
A survey of American writers from the mid-nineteenth century through the present.

Selected works of Geoffrey Chaucer.

ENGL (THEA) 4121 (5121). Shakespeare. Lec. 3. Credit 3.
Historical, thematic and other approaches in the study of Shakespeare. (May be repeated once as an elective provided the course content is different.)

Selected works of John Milton.

ENGL 4140 (5140). Topics in British Literature to 1667. Lec. 3. Credit 3.
Topics in Medieval and/or Early Modern British literature. Course may be repeated provided the content is different each time.

Studies in eighteenth-century British literature.

ENGL 4221 (5221). Romantic Literature. Lec. 3. Credit 3.
Studies in Romantic literature.

ENGL 4231 (5231). Victorian Literature. Lec. 3. Credit 3.
Studies in Victorian literature.

ENGL 4240 (5240). Topics in British Literature after 1667. Lec. 3. Credit 3.
Studies in Modern British literature. Course may be repeated provided the content is different each time.

ENGL 4250 (5250). Post Modern Literatures in English. Lec. 3. Credit 3.
Studies in post modern literary issues of significance in English-speaking cultures outside the United States.
ENGL 4310 (5310). Early American Literature.  
Lec. 3. Credit 3.  
Study of American literature from colonial period through early nationalist period.

ENGL 4321 (5321). Nineteenth Century American Literature.  
Lec. 3. Credit 3.  
Study of the literature and literary movements of the period, with emphasis on romanticism and/or realism.

ENGL 4330 (5330). Modern American Literature.  
Lec. 3. Credit 3.  
Study of the literature and literary movements of the period, with emphasis on the twentieth century and/or contemporary period.

ENGL 4340 (5340). Topics in American Literature.  
Lec. 3. Credit 3.  
Thematic, interdisciplinary or genre-based approaches to American literary study beyond the usual scope of ENGL 4310 (5310), ENGL 4320, or ENGL 4330 (5330). Course may be repeated provided the content is different each time.

ENGL 4411 (5411). Writing in the Professions.  
Lec. 3. Credit 3.  
This course builds on students' present writing competency and focuses on writing in their particular majors and/or professions.

Lec. 3. Credit 3.  
Introduces students to various models of argumentation through theory (readings) and practice (analysis and production).

ENGL 4430 (5430). Creative Writing: Fiction.  
Lec. 3. Credit 3.  
Prerequisite: Grade of C or better in ENGL 3400 or prior consent of the instructor. Guided practice in the craft and art of writing short fiction. Course may be repeated provided the content is different each time.

ENGL 4440 (5440). Creative Writing: Essay.  
Lec. 3. Credit 3.  
Prerequisite: Grade of C or better in ENGL 3400 or prior consent of the instructor. Guided practice in the craft and art of writing personal essays. Course may be repeated provided the content is different each time.

ENGL 4450 (5450). Creative Writing: Poetry.  
Lec. 3. Credit 3.  
Prerequisite: Grade of C or better in ENGL 3400 or prior consent of the instructor. Guided practice in the craft and art of writing poetry. Course may be repeated provided the content is different each time.

ENGL (LING) 4511 (5511). Introduction to Descriptive Linguistics.  
Lec. 3. Credit 3.  
Introduction to descriptive analysis of language: phonology, morphology, lexicon, and syntax.

ENGL (LING) 4521 (5521). History of the English Language.  
Lec. 3. Credit 3.  
History of the language from its origins to the present; emphasis upon historical development of English sounds, word structure, and syntax.

ENGL (LING) 4531 (5531). Grammar and Language.  
Lec. 3. Credit 3.  
Grammatical structure of English in relation to dialect and register with some emphasis on historical and potential changes in grammar.

ENGL (LING) 4541 (5541). Topics in Linguistics/Language.  
Lec. 3. Credit 3.  
Examination of specific aspects of language and/or linguistic study, such as Old and Middle English, the language of dialect literature or American English dialects. Course may be repeated provided the content is different each time.

Lec. 3. Credit 3.  
The course introduces students to rhetoric--history and special topics.

ENGL 4610 (5610). Novel.  
Lec. 3. Credit 3.  
Theory of the novel and a study of selected novels.

ENGL 4620 (5620). Poetry: Form, Genre, Theory.  
Lec. 3. Credit 3.  
The study of poetry written in English and translated from other languages, with attention to such topics as poetic movements, styles, trends, the evolution, and development of forms.

ENGL 4630 (5630). Literary Criticism and Theory.  
Lec. 3. Credit 3.  
Historical and thematic studies of critical and theoretical trends and issues.

ENGL 4640 (5640). Modern and Contemporary Drama.  
Lec. 3. Credit 3.  
Study of dramatic texts and performance issues from the late 19th century to the present.

ENGL 4650. The Graphic Novel.  
Lec. 3. Credit 3.  
Theory of comics-format texts and study of selected graphic novels.

ENGL 4712 (5712). African American Literature.  
Lec. 3. Credit 3.  
Studies of African American literature and culture, both oral and printed.

ENGL 4713 (5713). Native American Literature.  
Lec. 3. Credit 3.  
Studies of Native American literature and culture, both oral and printed.

ENGL 4720 (5720). Continental Literature.  
Lec. 3. Credit 3.  
Study of major works and writers from the European continent.
ENGL 4731 (5731). Approaches to Women and Literature.
Lec. 3. Credit 3.
Studies of major women writers or images of women in literature. Course may be repeated provided the course content is different each time.

ENGL 4741 (5741). Science and Culture.
Lec. 3. Credit 3.
Cultural influences on scientific discourse and literature about science.

ENGL 4751 (5751). Topics in Non-Western Literature.
Lec. 3. Credit 3.
Focuses on literature written outside of European literary traditions, either written in or translated into English. Course may be repeated for credit as long as the topic is different.

ENGL 4810 (5810). Introduction to Folklore.
Lec. 3. Credit 3.
Generic survey of folklore; possible definitions, varieties, meanings, and methods of study. Stress on verbal traditions (tales, songs, and beliefs).

ENGL 4820. Survey of Upper Cumberland Folklore.
Lec. 3. Credit 3.
Folklore of the Upper Cumberland, with emphasis on relationships between regional material and the broad perspective of the humanities.

ENGL 4830 (5830). Southern Literature.
Lec. 3. Credit 3.
Major writers of the South, with emphasis on regional themes and on the Southern literary renaissance.

ENGL 4840 (5840). The Gothic Tale of Terror.
Lec. 3. Credit 3.
Readings in Gothic poetry and prose.

ENGL 4910 (5910). The Literature of Science.
Lec. 2. Credit 2.
Topics in literary non-fiction written by scientists. Note: Students will not receive credit for both ENGL 4910 and ENGL 4911.

ENGL 4911 (5911). The Literature of Science.
Lec. 2. Rec. 1. Credit 3.
Topics in literary non-fiction written by scientists. The recitation provides additional writing/discussion opportunities. Note: Students will not receive credit for both ENGL 4910 and ENGL 4911.

ENGL 4920 (5920). Literature and Technology.
Lec. 2. Credit 2.
Study of British and American literature which deals with the impact of technology on society. Note: Students will not receive credit for both ENGL 4920 and ENGL 4921.

ENGL 4921 (5921). Literature and Technology.
Lec. 2. Rec. 1. Credit 3.
Study of British and American literature which deals with the impact of technology on society. The recitation provides additional writing/discussion opportunities. Note: Students will not receive credit for both ENGL 4920 and ENGL 4921.

ENGL 4930 (5930). Literature and the Environment.
Lec. 2. Credit 2.
A study, through literature, of the relationship between humans and the environment. Note: Students will not receive credit for both ENGL 4930 and ENGL 4931.

ENGL 4931 (5931). Literature and the Environment.
Lec. 2. Rec. 1. Credit 3.
A study, through literature, of the relationship between humans and the environment. The recitation will provide additional writing/discussion opportunities. Note: Students will not receive credit for both ENGL 4930 and ENGL 4931.

ENGL (PC) 4970 (5970). Professional Communication II.
Lec. 3. Credit 3.
A continuation of ENGL 3250 with emphasis on more complex reports. Same as PC 4970 (5970)

ENGL 4981, 4982, 4983 (5980). Topics. Credit 1, 2, or 3.
Coursework or directed individual research in any area where there is no other course offering.

ENGL 4990 (5990). Internship. Credit 3, 6, 9, or 12.
Prerequisite: Junior or senior status, ENGL 4411 (5411) or ENGL 3250, and consent of instructor. Part-time or full-time employment in a business or institution setting related to a student's academic and career goals. Cannot be taken in place of required or elective English courses, undergraduate or graduate.

ENGL 4995. Senior Colloquium. Lec. 3. Credit 3.
Prerequisite: Senior standing as an English BA major; completion of all required ENGL 3000-level courses. Intensive study of a theme or period selected by the instructor, with an emphasis on research, writing, discussion, and presentation.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

English as a Second Language (ESL)

This course is required for all students whose native language is not English, undergraduate and graduate, in their first two semesters at Tennessee Tech unless specifically exempted by high TOEFL and placement test results. A minimum grade of C in ESL 1010 is a prerequisite to ESL 1020. A minimum grade of C in ESL 1020 is a prerequisite to ENGL 1010. ESL 1010 and ESL 1020 do not satisfy the ENGL 1010 and ENGL 1020 communication requirement of the general education core, nor do these courses count toward any degree requirements.

English for non-native speakers with emphasis on pronunciation, idioms, syntax, and vocabulary. Additional work in the language laboratory at the discretion of the instructor.
English as a Second Language Pedagogy (ESLP)

ESLP 4100 (5100). ESL Methodology and Materials for PreK-12. Lec. 3. Credit 3.
Prerequisite: Admission to the Teacher Education Program. Current approaches, methodologies, techniques, and materials for teaching ESL primarily in preK-12 situations; developing literacy skills appropriate for age and language proficiency levels.

ESLP 4200 (5200). ESL Assessment: Reading and Writing. Lec. 3. Credit 3.
Prerequisite: ESLP 4100, LING 4511, and SEED 4125 or CUED 4150. Assessing proficiency for ESL placement and eventual integration into school curriculum (mainstreaming) with special emphasis on language literacy skills: reading and writing.

ESLP 4300 (5300). Field Experience in ESL. Credit 3.
Prerequisite: ESLP 4100 and ESLP 4200, or consent of instructor. Teaching ESL in preK-12 under supervision of experienced ESL staff: writing objectives, planning lessons, materials evaluation, testing.

Exercise Science, Physical Education and Wellness (EXPW)

Introduction to professional program of studies, problem solving processes related to self and group participation, and skills for academic success.

Historical background, general scope, occupational opportunities, principles and objectives of exercise science, and physical education and wellness.

EXPW 1150. Care and Prevention of Athletic Injuries. Lec. 3. Credit 3.
Care and prevention of athletic injuries: preventing, recognizing, managing, and rehabilitating athletic injuries.

Prerequisite: Sophomore standing and EXPW 1150. Advanced study of the etiology, pathology, and clinical signs of common athletic injuries to the lower extremities and spine. Emphasis is placed on clinical evaluation of injury by the athletic trainer. Application of orthopedic and neurological assessment is included.

Prerequisite: EXPW 2001 and BIOL 2010. Advanced study of the etiology, pathology, and clinical signs of common athletic injuries to the upper extremities and abdomen. Emphasis is placed on clinical evaluation of injury by the athletic trainer. Application of orthopedic and neurological assessment is included.

Prerequisite: EXPW 1150. Corequisite: EXPW 2001. This course is designed to evaluate specific clinical proficiencies, introduced the previous semesters. In specific, this course will cover competencies taught in EXPW 1150 and EXPW 3330. Students will receive clinical instruction in order to meet clinical competencies in athletic training; class will also include clinical coverage for athletic teams and events.

Prerequisite: EXPW 2010. Corequisite: EXPW 2002. This course is designed to evaluate specific clinical proficiencies, introduced the previous semesters. In specific, this course will cover competencies taught in EXPW 2001 and BIOL 2010. Students will receive clinical instruction in order to meet additional clinical competencies in athletic training; class will continue clinical coverage for athletic teams and events.

EXPW 2100. Life Guard Training. Credit 2.
Duties and responsibilities of life guards of swimming pools and at protected open water non-surf beaches.

Areas of content of the school health program.

Anatomy and physiology of male and female reproductive systems, human sexual response, conception, childbirth, contraception, sexually transmitted diseases, deviant sexuality, current issues, attitudes, and practices.

The study of legal and illegal drugs and their relationship to contemporary society.

EXPW 2170. Introduction to Sport Management. Lec. 3. Credit 3.
Overview of the fundamental principles of management and administration of sport programs. Combines theory and practice related to legal and ethical issues, marketing, and organizational structure of sport-related services and facilities.

EXPW 2430. First Aid, Safety and CPR. Lec. 1. Lab. 2. Credit 2.
Practice and application of the standards and accepted principles of safety education and first aid.

Safety problems in the home, school, public places, highways and the specific problems of industry along with an emphasis on proper attitudes toward safe driving and safety in general.

EXPW 3001. Therapeutic Rehabilitation and Modalities I. Lec. 3. Credit 3.
Prerequisite: EXPW 2002, EXPW 2020, and BIOL 2020. Principles in planning and implementation of rehabilitation programs for injured athletes. Emphasis on contemporary therapeutic exercise techniques combined with the use of therapeutic agents in the treatment, and rehabilitation of
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athletic injuries to the lower extremities and spine.

**EXPW 3002. Therapeutic Rehabilitation and Modalities II.**
Lec. 3. Credit 3.
Prerequisite: EXPW 3001. Principles in planning and implementation of rehabilitation programs for injured athletes. Emphasis on contemporary therapeutic exercise techniques, combined with the use of therapeutic agents in the treatment, and rehabilitation of athletic injuries to the upper extremities and abdomen.

**EXPW 3006. Medical Aspects.**
Lec. 3. Credit 3.
Prerequisite: EXPW 1150, EXPW 2001, and EXPW 2002. Advanced study in athletic training including common surgical techniques and the surgical process of the orthopedic, physician, general medical conditions and disabilities, head and facial injuries, and internal injuries in the athlete.

**EXPW 3011. Clinical III.**
Lec. 1. Credit 1.
Prerequisite: EXPW 2020. Corequisite: EXPW 3001 and EXPW 3006. This course is designed to evaluate specific clinical proficiencies, introduced the previous semesters. In specific, this course will cover competencies taught in EXPW 2003. Students will receive clinical instruction in extremity orthopedic assessment; class will also include clinical coverage for athletic teams and events.

**EXPW 3020. Clinical IV.**
Lec. 1. Credit 1.
Prerequisite: EXPW 3010. Corequisite: EXPW 3002. This course is designed to evaluate specific clinical proficiencies, introduced in previous semesters. In specific, this course will cover competencies taught in EXPW 3000 and EXPW 3006. Students will receive clinical instruction for advanced therapeutic exercise techniques; class will also include clinical coverage for athletic teams and events.

**EXPW 3031. Methods of Conditioning.**
Lec. 2. Credit 2.
Emphasis on health-related fitness assessments, weight training techniques, plyometrics, aerobic training, nutrition, ergogenic aids, and flexibility training.

**EXPW 3032. Exercise Prescription for Fitness and Wellness.**
Lec. 3. Credit 3.
Assessment of fitness and corresponding development of exercise and rehabilitation plans for health improvement.

**EXPW 3050. Water Safety Instructor's Course.**
Credit 2.
Instruction in senior lifesaving; parts one and two of the instructor's training course in water safety.

**EXPW 3070. Lifetime Wellness and Leisure Activities.**
Lec. 2. Lab. 2. Credit 3.
Skills development in lifetime wellness and leisure activities leading to personal physical fitness.

**EXPW 3092. Coaching Team Sports.**
Lec. 2. Lab. 1. Credit 3.
The theory and practice of coaching volleyball, basketball and soccer.

**EXPW 3132. School Health Pedagogy and Practicum.**
Lec. 2. Lab. 1. Credit 3.
Prerequisite: EXPW 2130, licensure major. Curriculum design, instructional methodology and supervised practicum in health education.

**EXPW 3170. Motor Learning.**
Lec. 3. Credit 3.
The principles of learning as applied to the acquisition of motor skills.

**EXPW 3180. Introduction to Coaching.**
Lec. 3. Credit 3.
This course provides candidates with an exposure to the application of theoretical aspects of coaching including philosophy, teaching, training, management, ethics, gender and culture.

**EXPW 3300. Sports Officiating.**
Lec. 2. Credit 2.
Detailed techniques and methods of sports officiating involving rule interpretation and ethical character.

**EXPW 3301. Sports Officiating: Spring Sports.**
Lec. 2. Credit 2.
This course is intended to teach the student the knowledge of the rules, duties, responsibilities, signals, positioning, and philosophy of a sports official through classroom and practical officiating experience for the sports of tennis, baseball, and softball. This class will require 15 hours of practical "lab" experience outside of the classroom and in addition to the lectures. Lecture length will be adjusted to accommodate for outside class requirements.

**EXPW 3330. First Aid and CPR Instructor's Training.**
Credit 2.
Additional instruction and experience in teaching first aid.

**EXPW 3410. Lifespan Motor Development.**
Lec. 3. Credit 3.
An introduction to developmental aspects of human motor behavior across the life span. Focus on characteristic stages and issues related to the physical growth, and motor development.

**EXPW 3510. Physical Education Skills in Grades K-8.**
Credit 3.
Skills for promoting motor learning and fitness appropriate for young children.

**EXPW 3720. Instructional Strategies.**
Lec. 3. Credit 3.
Philosophy and models of instruction and administration of physical education.

**EXPW 4001. Senior Seminar.**
Lec. 2. Credit 2.
Prerequisite: Senior standing, EXPW 3020, EXPW 3002, and EXPW 3006. A class designed for athletic training students to receive a broad overview of athletic training principles and recent research findings. In addition, this course will help prepare athletic training students for the NATABOC certification exam and preparation for employment in the field of the athletic training.

**EXPW 4011. Clinical V.**
Lec. 1. Credit 1.
Prerequisite: EXPW 3020, EXPW 3002, and EXPW 3006. This course is designed to evaluate specific clinical proficiencies, introduced the previous semesters. In specific, this course will cover competencies taught in EXPW 3001. Students will receive clinical instruction in order to meet advanced clinical
competencies in athletic training; class will also include advanced clinical coverage for athletic teams and events.

**EXPW 4021. Clinical VI.**  Lec. 1. Credit 1. Prerequisite: EXPW 4010. Corequisite: EXPW 4001. This course is designed to evaluate specific clinical proficiencies introduced the previous semesters. In specific, this course will cover competencies taught in EXPW 4530, EXPW 4750, and NURS 4230. Students will receive clinical instruction in order to meet final clinical competencies and outcome competencies needed for athletic training; class will also include clinical coverage for athletic teams and events.

**EXPW 4030. Coaching Tennis.**  Lab. 2. Credit 1. A course designed for the prospective coach of tennis. The course will provide information of skill progressions, systems of play, conditioning, strategies, psychological and organizational aspects of the game and rules.

**EXPW 4032. Training for Performance.**  Lec. 3. Credit 3. Theoretical understanding and practical development of training programs intended to maximize sport performance.

**EXPW 4040. Coaching Baseball.**  Credit 2. Techniques and methods of coaching baseball.

**EXPW 4042. Health Promotion.**  Lec. 3. Credit 3. Evaluation of various physical activity behavior change models and assessment of health promotion programs and evaluation standards.

**EXPW 4060. Coaching Golf.**  Lec. 2. Credit 1. Prerequisite: EXPW 3180. Corequisite: EXPW 4810. This course is designed to discuss the specific principles, theories, strategies for coaching the competitive golfer. Recruitment, practice planning, conditioning, scheduling of events, course management, mental play, skill, and swing corrective techniques will be emphasized.


**EXPW 4070. Coaching Soccer.**  Lab. 2. Credit 1. A course designed for the prospective coach of soccer. The course will provide information of skill progressions, systems of play, conditioning, strategies, and psychological and organizational aspects of the game.

**EXPW 4080. Coaching Track and Field.**  Lec. 1. Lab. 1. Credit 1. Prerequisite: EXPW 3180 or consent of instructor. A course designed for the prospective coach of track and field. The course will provide information of skill progressions, systems of play, conditioning, strategies, and psychological and organizational aspects of the game and rules.

**EXPW 4090. Coaching Softball.**  Lab. 2. Credit 1. A course designed for the prospective coach of softball. The course will provide information of skill progressions, systems of play, conditioning, strategies, and psychological and organizational aspects of the game.

**EXPW 4171. Exercise and Sport Psychology.**  Lec. 3. Credit 3. Prerequisite: PSY 2010 or permission of instructor. The purpose of this course is provide candidates interested in Exercise and Sport Psychology with an overview of theories and principles explaining factors influencing human behavior in exercise, rehabilitation, and sport.

**EXPW 4210. Gerontology.**  Lec. 3. Credit 3. Needs of older citizens; ways of providing opportunities for this population.

**EXPW 4290. Accident Prevention.**  Credit 2. Emphasis on proper attitudes toward safe driving and safety in general.

**EXPW 4300. Basic Driver and Traffic Safety Education.**  Credit 2. Actual experiences in simulation and behind-the-wheel driver education.

**EXPW 4310. Advanced Driver and Traffic Safety Education.**  Credit 2. Current materials and administration of simulation and behind the wheel driver education programs.

**EXPW 4340. Field Experience in Health Education.**  Credit 2. Practical field experience with a school, public, or voluntary health agency.

**EXPW 4420. Kinesiology.**  Lec. 3. Credit 3. Prerequisite: BIOL 2010 or BIOL 2350. Advanced anatomy of the muscular, skeletal and articular systems, and biomechanics and applications to athletic training and performance.

**EXPW 4440. Physiology of Exercise.**  Lec. 3. Credit 3. Prerequisite: BIOL 2350. Physiological effects of exercise, sports, and other stresses on the various systems of the human body. Application of principles to physical fitness, physical education, and athletics.

**EXPW 4520. Adapted Physical Activity and Sport.**  Lec. 2. Lab 2. Credit 3. Developing physical education programs for populations with special needs.

**EXPW 4530. Organization and Administration of Interschool Athletics.**  Lec. 3. Credit 3. Athletics which concern head coaches, assistant coaches, athletic directors, and principals or administrators.

**EXPW 4540. Ethical Issues in Sport.**  Lec. 3. Credit 3. This course is designed to assist students in self-evaluating,
examining, and developing a philosophy, values, and moral reasoning skills. Major moral/ethical issues within sports will be researched and discussed. Students will experience the ethical decision-making process through opportunities for critical analysis drawing upon their philosophical values.

**EXPW 4550. Sport Goverance.** Lec. 3. Credit 3.
This course is designed for students interested in the growing problems of sports litigation. Amateur and professional aspects of sports are covered from four major perspectives: (1) judicial review of athletic associations; (2) eligibility, rules and disciplinary measures; (3) equal opportunity provisions; and (4) tort liabilities. Specific topics include due process, anti-trust, and free speech, coed competition, duty of ordinary care, and of care owed athletes and spectators, injuries, assumption of risk, and contributory negligence. The course stresses the application of principles of law to the sports setting. Actual court cases relating to these principles are examined.

**EXPW 4560. Facility Planning and Management.** Lec. 3. Credit 3.
Overview of all elements involved in sport event management. Key component of course is the planning, organizing, marketing, and conducting of an event during the semester. Open to Sport Management majors with permission of instructor.

**EXPW 4711. Analysis and Development of Sport Skills.** Credit 4.
Prerequisite: Licensure major acceptance into Upper Division Teacher Education. Instructional methods in developing and analyzing skills necessary to successfully teach sports at the secondary level.

**EXPW 4721. Methods of Elementary Movement.** Credit 4.
Prerequisite: Licensure major and acceptance into Upper Division Teacher Education. Instructional methods in motor skills and movement concepts, including rhythms and gymnastics.

**EXPW 4730. Assessment and Evaluation in Physical Education.** Lec. 3. Credit 3.
Various forms and kinds of testing and measuring in physical education.

**EXPW 4750. Advanced Athletic Training.** Lec. 3. Credit 3.
Prerequisite: EXPW 4420 and EXPW 4440. Advanced rehabilitation techniques, athletic training organization and administration.

**EXPW 4810, 4820, 4830. Field Experience.** Lab 1-4. Credit 1-4.
Prerequisite: Successful completion of course requirements in the core requirements. Three to nine hours of credit may be earned. This course may be taken independent of course work as a culminating experience for three hours credit or as a corequisite for coaching courses in the coaching concentration for 1-4 hours of credit. Candidates are expected to complete a minimum of three clock hours per week per semester for each semester hour of credit. Participation in on-the-job experiences will be provided in a wide range of hosting agencies, institutions, and clinics. Requirements for course completion will vary depending on the number of credit hours to be earned.

**EXPW 4811. Sport Management Internship.** Credit 3.
One semester work experience with a cooperating agency. Application must be approved one semester in advance.

**EXPW 4871. Residence I.--Fall only.** Credit 5.
Prerequisite: Licensure major, acceptance into Upper Division Teacher Education and completion of EXPW 4711 and EXPW 4721 with a grade of B or higher. Corequisite: EXPW 4872. Supervised experience in authentic teaching of elementary and secondary physical education classes.

**EXPW 4872. Professional Seminar I.--Fall only.** Credit 5.
Corequisite: EXPW 4871. Problem-based learning experiences related to assessment, evaluation and curriculum design for elementary and secondary physical education.

**EXPW 4881. Residence II.--Spring only.** Credit 10.
Prerequisite: Licensure major, acceptance into Upper Division Teacher Education and completion of EXPW 4871 and with EXPW 4872 with a grade of B or higher. Corequisite: EXPW 4882. Supervised experience in full-time teaching of elementary and secondary physical education.

**EXPW 4882. Professional Seminar II.--Spring.** Credit 2.
Corequisite: EXPW 4881. Seminar on issues related to the interrelationships among school, culture and society; a historical, philosophical and sociological analysis.

**Finance (FIN)**

Enrollment in junior- and senior-level FIN courses requires junior standing. All business majors must have completed the Basic Business Program.

**FIN 2000. Personal Finance.** Lec. 3. Credit 3.
Financial concepts and practices relevant to personal financial decision making. (In order to receive credit toward a degree in business, this course must be taken prior to enrolling in FIN 3210 or its equivalent.)

**FIN 3210. Principles of Managerial Finance.** Lec. 3. Credit 3.
Prerequisite: ECON 2010, ECON 2020, and ACCT 2120 (or ACCT 3720 for non-business majors only). Financial theory and procedures required for the financial decision-making function of business organizations.

Prerequisite: FIN 3210. Leasing, dividend policy, capital structure, long-term financing, convertibles, and warrants.

**FIN 3410 . Principles of Real Estate.** Lec. 3. Credit 3.
Basic concepts, procedures, and analysis of real estate, property rights and liabilities, real estate instruments, estates, and liens.
FIN 3610. Risk Management and Insurance.  
Lec. 3. Credit 3.  
Fundamentals underlying the insurance method of handling risk, including the cost and functions of insurance contracts related to business and personal decision-making.

FIN 3830. Fundamentals of Investment.  
Lec. 3. Credit 3.  
Prerequisite: ECON 3610, FIN 3210, or consent of instructor.  
Investment alternatives, markets and techniques of security valuation and analysis with emphasis on stock markets.

Lec. 3. Credit 3.  
Prerequisite: FIN 3220, ECON 3610, and FIN 3830.  
Cash-flow analysis, budgeting, NPV, financial ratio analysis, financial planning, and use of microcomputers in finance.

FIN 4430. Real Estate Finance and Appraisal.  
Lec. 3. Credit 3.  
Prerequisite: FIN 3210.  
Principles of financing real estate transactions, including valuation, sources of funds, cost of financing, and real estate appraisal.

FIN 4470. Investment Challenge I.  
Lec. 3. Credit 3.  
Prerequisite: FIN 3830 and permission of instructor.  
Advanced portfolio theory through actual management of a real investment portfolio.

FIN 4480. Investment Challenge II.  
Lec. 3. Credit 3.  
Prerequisite: FIN 3830 and permission of instructor.  
Advanced portfolio theory through actual management of a real investment portfolio.

FIN (ECON) 4510. International Trade and Finance.  
Lec. 3. Credit 3.  
Prerequisite: ECON 3320.  
International trade and monetary exchange, balance of payments and foreign investments.

FIN 4800. Investment Analysis and Portfolio Management.  
Lec. 3. Credit 3.  
Prerequisite: FIN 3830.  
Investments in a portfolio context.  
Analysis and management of portfolios.

FIN 4900. Commercial Banking.  
Lec. 3. Credit 3.  
Prerequisite: ECON 3320.  
Bank operations, including policy making and management of assets, liabilities and capital.

FIN 4910. Multinational Financial Management.  
Lec. 3. Credit 3.  
Prerequisite: FIN 3210.  
International markets and instruments, global financing strategies, global capital budgeting, global working capital management, and international tax planning.

FIN 4930. Integrative Case Studies in Finance.  
Lec. 3. Credit 3.  
Prerequisite: FIN 3220.  
Case studies simulating the role of the modern financial manager in financial decision making.

FIN 4990. Special Topics.  
Credit 3-6.  
Directed study and research on a selected topic in finance.  
Consent of departmental chairperson.

FIN 5020. Basic Finance.  
Lec. 3. Credit 3.  
Corequisite or prerequisite: ACCT 5010.  
Introduction to the concepts and procedures needed for basic financial decision making in a corporate environment.  
Includes problem solving using spreadsheet templates.

Foreign Languages and Cultural Studies (FLCS)

FLCS 1010. Foreign Languages and Cultural Studies I.  
Cross-listed with:  
FREN 1010 Elementary French I  
GERM 1010 Elementary German I  
SPAN 1010 Elementary Spanish I

FLCS 1020. Foreign Languages and Cultural Studies II.  
Cross-listed with:  
FREN 1020 Elementary French II  
GERM 1020 Elementary German II  
SPAN 1020 Elementary Spanish II

FLCS 2010. Foreign Languages and Cultural Studies III.  
Cross-listed with:  
FREN 2010 Transition to Intermediate French  
GERM 2010 Transition to Intermediate German  
SPAN 2010 Transition to Intermediate Spanish

FLCS 2020. Foreign Languages and Cultural Studies IV.  
Cross-listed with:  
FREN 2020 Intermediate French  
GERM 2020 Intermediate German  
SPAN 2020 Intermediate Spanish

FLCS 3000. Global Studies.  
Lec. 3. Credit 3.  
Prerequisite: Junior standing.  
Global topics will be examined from the perspective of current research in Germanic, Hispanic, and Francophone Studies, and from a variety of other disciplines, highlighting connections between the larger class topic, the international community, and the local community.  
Topics will change.

Foreign Language Studies (FLST)

FLST 1011-1013. Elementary Foreign Language Study I.  
Credit 1-3.  
Prerequisite: FLST 1013 or equivalent is prerequisite to FLST 1021.  
Essentials of the language, developing listening and reading comprehension, oral and written communication, and cultural understanding.  
Course may be repeated if the language is different.

FLST 1021-1023. Elementary Foreign Language Study I.  
Credit 1-3.  
Prerequisite: FLST 1013 or equivalent is prerequisite to 1021.  
Essentials of the language, developing listening and reading comprehension, oral and written communication, and cultural understanding.  
Course may be repeated if the language is different.

Foreign Languages – French (FREN)

Students who begin their college German studies at the intermediate level and who complete FREN 2010-2020 with an
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average of at least 2.0 in those courses will, upon request, receive credit for FREN 1010-1020 with a grade of S. This provision does not apply to anyone who takes a proficiency test at the 2000-level for credit.

FREN 1010. Elementary French I. Lec. 3. Credit 3. Essentials of French, developing listening and reading comprehension, oral and written communication, and cultural understanding.

FREN 1020. Elementary French II. Lec. 3. Credit 3. Prerequisite: FREN 1010. Essentials of French, developing listening and reading comprehension, oral and written communication, and cultural understanding. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

FREN 2010. Transition to Intermediate French. Lec. 3. Credit 3. Prerequisite: FREN 1020. Continuation of the essentials of French, developing listening and reading comprehension, oral and written communication, and cultural understanding begun in 1010.1020. Review as necessary. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

FREN 2020. Intermediate French. Lec. 3. Credit 3. Prerequisite: FREN 2010. Expansion of French language study, building on the fundamentals of French acquired in 1010, 1020, and 2010. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

◆FREN 2510. French Culture and Civilization. Lec. 3. Credit 3.

No background in French required. This course is taught in English. Introduction to French cultural and intellectual history, geography and diversity, arts and the political and social structures and characteristics of France today. Credit will not be given for both FREN 2510 and FREN 3510.

FREN 3010. Written Communication in French. Lec. 3. Credit 3. Prerequisite: FREN 2020. Writing with additional practice in listening, speaking and reading, while exploring cultural topics. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3020. Oral Communication in French. Lec. 3. Credit 3. Prerequisite: FREN 2020. Oral communication (speaking and listening) with additional practice in writing and reading while exploring cultural topics. Required for majors. Students with native-like fluency in French will substitute a different upper-level course for this one. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3100. French Phonetics. Lec. 3. Credit 3. Prerequisite: FREN 3010. Detailed analysis of the significant features of the French sound system, intonation patterns, and graphic representations of phonemes. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3110. Survey of French Literature I. Lec. 3. Credit 3. Prerequisite: FREN 3010. Literature of France from its earliest development to the present day. Required for majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3112. Culture and Civilization of France. Lec. 3. Credit 3. Prerequisite: FREN 3010. A study of important aspects of French civilization and culture from its beginning to present day. Required for French majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3120. Survey of French Literature II. Lec. 3. Credit 3. Prerequisite: FREN 3010. Literature of France from the nineteenth century through present day. Required for majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3200. Business French. Lec. 3. Credit 3. Prerequisite: FREN 3010. Business vocabulary, readings, and conversations in French on various business topics and on culture as it affects business interactions and practices in social and formal situations. Required for majors in World Cultures and Business who have a concentration in French. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 3510. France: The Country & the People. Lec. 3. Credit 3. No background in French required. Introduction in English to the history, arts, geography, and government of France and to the social characteristics of the French people.

FREN 4810 (5810). Special Topics in French. Lec. 3. Credit 3. Prerequisite: FREN 3010. This course may be repeated if the topic is different. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

FREN 4910. Directed Studies in French. Ind. 3. Credit 3. Prerequisite: FREN 3010 or equivalent or consent of instructor. Concentrated readings in areas of special interest. Available to French majors on an individual basis, with consent of departmental chairperson.

FREN 4920. Senior Capstone. Ind. 3. Credit 3. Prerequisite: Senior standing and completion of at least 21 credit hours in the core courses for the major. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will integrate, enhance, and demonstrate the knowledge and skills learned during their undergraduate education in the areas of: speaking, listening comprehension, reading, writing, and cultural literacy in the

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Foreign Languages – German (GERM)

Students who begin their college German studies at the intermediate level and who complete GERM 2010-2020 with an average of at least 2.0 in those courses will, upon request, receive credit for GERM 1010-1020 with a grade of S. This provision does not apply to anyone who takes a proficiency test at the 2000-level for credit.

GERM 1010. Elementary German I.  Lec. 3. Credit 3.
Essentials of German, developing listening and reading comprehension, oral and written communication, and cultural understanding.

GERM 1020. Elementary German II.  Lec. 3 Credit 3.
Prerequisite: GERM 1010. Essentials of German, developing listening and reading comprehension, oral and written communication, and cultural understanding. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

Prerequisite: GERM 1020. Continuation of the essentials of German, developing listening and reading comprehension, oral and written communication, and cultural understanding begun in 1010.1020. Review as necessary. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

Prerequisite: GERM 2010. Expansion of German language study, building on the fundamentals of German acquired in GERM 1010, GERM 1020, and GERM 2010. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

No background in German required. Introduction in English to German cultural history, geography and diversity, art, architecture, music and literature, and to the political and social structures and characteristics of Germany today in the context of the European Union. Credit will not be given for both GERM 2520 and GERM 3520.

GERM 3010. Written Communication in German.  Lec. 3. Credit 3.
Prerequisite: GERM 2020. Writing with additional practice in listening, speaking and reading, while exploring cultural topics. Required for majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 3020. Oral Communication in German.  Lec. 3. Credit 3.
Prerequisite: GERM 2020. Oral communication (speaking and listening) with additional practice in writing and reading while exploring cultural topics. Required for majors. Students with native-like fluency in German will substitute a different upper-level course for this one. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 3150. Introduction to German Literature.  Lec. 3. Credit 3.
Prerequisite: GERM 3010. Literature of the German-speaking countries from its earliest development to the present day. Required for majors. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 3200. Business German.  Lec. 3. Credit 3.
Prerequisite: GERM 3010. Business vocabulary, readings and conversations in German on various business topics and on culture as it affects business interactions, and practices in social and formal situations. Required for majors in International Business and Cultures who have a concentration in German. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

No background in German required. An expanded version of GERM 3510 with some additional topics. No credit will be given for both GERM 3510 and GERM 3520.

GERM 4510. German Literature in English Translation.  Lec. 3. Credit 3.
Selected topics in German literature, with lectures and readings in English. No foreign language training is required.

GERM 4810 (5810). Special Topics in German.  Lec. 3. Credit 3.
Prerequisite: GERM 3010. This course may be repeated if the topic is different. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

GERM 4910. Directed Studies in German.  Ind. 3. Credit 3.
Prerequisite: GERM 3010 or equivalent or consent of instructor. Concentrated readings in areas of special interest. Available to German majors on an individual basis, with consent of departmental chairperson.

GERM 4920. Senior Capstone.  Ind. 3. Credit 3.
Prerequisite: Senior standing and completion of at least 21 credit hours in the core courses for the major. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will integrate, enhance, and demonstrate the knowledge and skills learned during their undergraduate education in the areas of: speaking, listening comprehension, reading, writing, and cultural literacy in the target language.
Foreign Languages – Japanese (JAPN)

Lec. 3. Credit 3.
No background in Japanese required. Introduction in English to the history, arts, geography, and business structures of Japan, and to the customs of Japanese society.

Foreign Languages – Russian (RUSS)

RUSS 1010-1020. Elementary Russian I.
Lec. 3. Credit 3.
Prerequisite: RUSS 1010 or equivalent is prerequisite to 1020. Essentials of Russian, developing listening and reading comprehension, oral and written communication, and cultural understanding.

Lec. 3. Credit 3.
Prerequisite: RUSS 1020 or equivalent. Continuation of the essentials of Russian, developing listening and reading comprehension, oral and written communication, and cultural understanding begun in 1010-1020. Review as necessary.

Lec. 3. Credit 3.
Prerequisite: RUSS 2010 or equivalent. Expansion of Russian language study, building on the fundamentals of Russian acquired in 1010, 1020, and 2010.

RUSS 3510. Russia: The Country and the People.
Lec. 2. Credit 2.
No background in Russian required. Introduction in English to the arts, geography, economics, and government of Russia and to the social characteristics of the people.

Foreign Languages – Spanish (SPAN)

SPAN 1010. Elementary Spanish I.
Lec. 3. Credit 3.
Essentials of Spanish, developing listening and reading comprehension, oral and written communication, and cultural understanding.

SPAN 1015. Spanish for Health Services.
Lec. 3. Credit 3.
Course restricted to Nursing majors (Special permission is needed from instructor for all other majors.). Spanish language instruction for students entering the medical fields. They will learn the Spanish language—development of oral, reading, writing, and listening communication skills..and knowledge of Hispanic culture necessary to be able to communicate with their future Hispanic patients efficiently and effectively. Students may not enroll if they have already received credit for a Spanish course or if they already have native-like fluency in Spanish.

SPAN 1020. Elementary Spanish II.
Lec 3. Credit 3.
Prerequisite: SPAN 1010 or SPAN 1015. Essentials of Spanish, developing listening and reading comprehension, oral and written communication, and cultural understanding.

Lec. 3. Credit 3.
Prerequisite: SPAN 1020 Continuation of the essentials of Spanish, developing listening and reading comprehension, oral and written communication, and cultural understanding begun in 1010.1020. Review as necessary. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

Lec. 3. Credit 3.
Prerequisite: SPAN 2010 Expansion of Spanish language study, building on the fundamentals of Spanish acquired in 1010, 1020, and 2010. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

SPAN 2510. Spanish Culture and Civilization.
Lec. 3. Credit 3.
No background in Spanish required. This course is taught in English. Introduction to Spanish cultural and intellectual history, geography and diversity, arts and the political and social structures, and characteristics of Spain today. Credit will not be given for both SPAN 2510 and SPAN 3510.

SPAN 2550. Latin American Culture and Civilization.
Lec. 3. Credit 3.
No background in Spanish required. Introduction in English to Spanish Latin American cultural history, geography, cultural and ethnic diversity, art, music, literature and to the political and social structures that have shaped modern Latin America. Credit will not be given for both SPAN 2550 and SPAN 3550.

SPAN 3010. Written Communication in Spanish.
Lec. 3. Credit 3.
Prerequisite: SPAN 2020. Writing with additional practice in listening, speaking and reading, while exploring cultural topics. Required for the major. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 3020. Oral Communication in Spanish.
Lec. 3. Credit 3.
Prerequisite: SPAN 3010 Oral communication (speaking and listening) with additional practice in writing and reading while exploring cultural topics. Required for majors. Students with native-like fluency in Spanish will substitute a different upper-level course for this one. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 3200. Spanish for Business I.
Lec. 3. Credit 3.
Prerequisite: SPAN 3010 Business vocabulary and readings in Spanish on various business topics and on culture as it affects business interactions and practices. Required for International Business and Cultures majors with language concentration in Spanish. Qualified students may be able to take this course without the prerequisite by contacting the instructor.
Lec. 3. Credit 3.  
No background in Spanish required. Introduction in English to the history, arts, geography, and government of Spain and to the civilization and social characteristics of the Spanish people.

SPAN 3550. Latin America: The Countries and the Peoples.  
Lec. 3. Credit 3.  
No background in Spanish required. Introduction in English to the history, arts, geography, and governments of the Spanish-speaking countries of Latin America and to the civilization and social characteristics of the people.

SPAN 4010 (5010). Introduction to the Literature of Spain.  
Lec. 3. Credit 3.  
Prerequisite: SPAN 3010. Selections from the literature of Spain. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 4020 (5020). Introduction to the Literature of Spanish America.  
Lec. 3. Credit 3.  
Prerequisite: SPAN 3010. Selections from the literature of Spanish America. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 4030 (5030). Advanced Spanish Conversation.  
Lec. 3. Credit 3.  
Prerequisite: SPAN 3020. Discussion in Spanish on political, medical, legal and business topics. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 4110 (5110). Culture and Civilization of Spain.  
Lec. 3. Credit 3.  
Prerequisite: SPAN 3010. Lectures, readings and discussion in Spanish on the culture and civilization of Spain. Qualified students may be able to take this course without the prerequisite by contacting the instructor.

SPAN 4120 (5120). Culture and Civilization of Spanish America.  
Lec. 3. Credit 3.  
Prerequisite: SPAN 3010. Lectures, readings, and discussion in Spanish on the culture and civilization of Spanish America. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

SPAN 4810. Special Topics in Spanish.  
Lec. 3. Credit 3.  
Prerequisite: SPAN 3010. This course may be repeated if the topic is different. Qualified students may be able to take this course without the prerequisite by contacting the Department of Foreign Languages.

SPAN 4910. Directed Studies.  
Read. 1-6. Credit 1-6 per semester. Maximum 16.  
Prerequisite: SPAN 3010 or equivalent or consent of instructor. Concentrated studies in areas of special interest. Available on an individual basis, with consent of departmental chairperson.

SPAN 4920. Senior Capstone.  
Ind. 3. Credit 3.  
Prerequisite: Senior standing and completion of at least 21 credit hours in the core courses for the major. Students will work individually, under the guidance of a faculty member, to create a portfolio and prepare a presentation to faculty and other students. In this course, students will integrate, enhance, and demonstrate the knowledge and skills learned during their undergraduate education in the areas of: speaking, listening comprehension, reading, writing, and cultural literacy in the target language.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Foundations of Education (FOED)

FOED 1821. Introductory Field Experience in Speech and Theatre Education.  
Lab. 3. Credit 1.  
Corequisite: FOED 2011. Observational field experience of FOED 2011 content conducted in authentic educational settings appropriate for licensure area(s). For all licensure majors, not available for freshmen.

FOED 1822. Introductory Field Experience and Orientation.  
Lab. 3. Credit 1.  
Corequisite: FOED 2011. Observational field experience of FOED 2011 content conducted in authentic educational settings appropriate for licensure area(s). For freshmen only.

FOED 2011. Introduction to Teaching and Technology.  
Lec. 2. Credit 2.  
Corequisite: FOED 1820, all licensure majors. FOED 1821, for freshmen only. An overview of school in America, the role and responsibility of the teacher, and an introduction to instructional technology principles and practices.

FOED 3010. Integrating Instructional Technology into the Classroom.  
Lec. 3. Credit 3.  
Prerequisite: FOED 2011 or the equivalent. Using, integrating and evaluating instructional technology in today’s classroom. Requirement: A minimum of grade of B to demonstrate a candidate’s competency in technology integration prior to student teaching.

FOED 3240. Instructional Technology I.  
Lec. 2. Credit 2.  
Development of an application of basic audio-visual and computer skills to facilitate quality instruction in the classroom. Credit cannot be obtained for CSC 1100 in addition to credit for either DS 2810 or FOED 3240.

FOED 3310. Microcomputers in Employment/Education.  
Credit 2.  
Windows-based microcomputers in employment and education. Focusing on work processing, spreadsheet, database, graphics, internet applications, and other computer tools.
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FOED 3340. Instructional Technology II.
   Lec. 1. Lab. 4. Credit 3.
   Prerequisite: FOED 3240. Selection, operation, use, and integration of instructional technology in today's classroom.

FOED 3800. Field Experiences in Education.
   Lab. 4.12. Credit 1-3.
   Prerequisite: Full admission to the Teacher Education Program. Supervised work experiences in public schools stressing the translation of theory into practice.

FOED 3810. Field Experiences in Education.
   Lab. 4-12.
   Supervised work experiences in public schools stressing the translation of theory into practice.

FOED 3820. Field Experiences in Education.
   Lab. 4-12.
   Supervised work experiences in public schools stressing the translation of theory into practice.

FOED 3830. Field Experiences in Education.
   Lab. 4-12.
   Supervised work experiences in public schools stressing the translation of theory into practice.

FOED 4340. Technology for Presentations.
   Credit 3.
   Prerequisite: FOED 3310. Development of knowledge and skills necessary for communications and presentations using various instructional technologies and Windows computer software.

Geography (GEOG)

GEOG 1010. Weather and Climate.
   Lec. 3. Credit 3.
   Introduction to weather and climate, landforms, soils, vegetation, and water.

GEOG 1110. World Geography.
   Lec. 3. Credit 3.
   This course examines the political, economic, demographic and environmental shifts happening in the world today. Throughout this course, students will be exposed to the following concepts: globalization, development of world regions, issues of people and land, diversity of cultures and regions, global changes and local responses, cultural and political landscapes, global economics, and environmental issues.

GEOG 1120. Human Geography.
   Lec. 3. Credit 3.
   Distribution of people and their activities as they are related to the earth.

GEOG 1130. Geography of Natural Hazards.
   Lec. 3. Credit 3.
   The societal and economic impact of natural hazards including flooding, hurricanes, tornadoes, volcanoes, earthquakes, landslides, disease, wildfire, drought, famine, and climate change. The response of governments, cultures, and individuals to natural hazards.

GEOG 3010. Geography of the United States.
   Lec. 3. Credit 3.
   Prerequisite: GEOG 1010. The United States and its physical environment, resources and cultural development.

GEOG (GEOL) 3200. Water Resources.
   Lec. 3. Credit 3.
   This course deals with water as a resource basic for life on Earth. Topics to be covered include: dams and reservoirs, irrigation, inter-basin transfers, river channel modification, flood control, water quality, and water laws.

GEOG 3330. Meteorology.
   Lec. 3. Lab. 2. Credit 4.
   Earth's atmosphere and the mechanics and causes of day to day weather changes.

GEOG (GEOL) 4150 (5150). Geomorphology.
   Lec. 3. Lab. 2. Credit 4.
   Prerequisite: GEOL 2500. Analysis of landforms and processes that shape them.

GEOG 4210 (5210). Cartography.
   Lec. 2. Lab. 2. Credit 3.
   Principles and practices of map construction and interpretation.

GEOG (GEOL) 4410 (5410). Remote Sensing.
   Lec. 2. Lab. 2. Credit 3.
   Prerequisite: GEOL 2500. Principles and applications of remote sensing. Provides a survey of the concepts and techniques of remote sensing and image analysis for natural resources, geomorphology, and Earth surface processes.

GEOG 4510 (5510). Theory of GIS, I.
   Lec. 3. Credit 3.
   Prerequisite: Consent of instructor. Introduction to 1) the PC ARC/INFO GIS package, 2) ArcView GIS package, and 3) the integration of Global Positioning Systems (GPS) with GIS.

GEOG 4511 (5511). Theory of GIS, II.
   Lec. 3. Credit 3.
   Prerequisite: Consent of instructor and GEOG 4510 (5510). Intermediate principles of GIS using ArcGIS and ArcView packages. Advanced integration of GPS and GIS. Spatial analysis and modeling capabilities of GIS emphasized.

GEOG 4620 (5620). Principles of GIS.
   Lec. 3. Credit 3.
   Introduction to the fundamentals of GIS. Theoretical and technical principles of managing and processing geographic data, nature of geographic data, spatial data models of map projection systems, kriging, structures, and spatial analytical and modeling techniques.

GEOG 4650 (5650). Environmental Applications of GIS.
   Lec. 3. Credit 3.
   Prerequisite: GEOG 4510 (5510). Applications of GIS in environmental sciences and engineering. Main emphasis is on approaches, scripting, and modeling exercises. Covers the scope of ecosystems, forestry, drainage basins, pollution modeling, and spatial analysis of contaminants in various environments using GIS as the main tool of analysis. Completion of a real-world GIS project is required.

GEOG (GEOL) 4711 (5711). Hydrogeology.
   Lec. 3. Lab. 2. Credit 4.
   Prerequisite: GEOL 1040 and GEOL 1045. Occurrence and
movement of ground water, well hydraulics, water quality, and
pollution.

GEOG 4810-4820. Special Problems. Credit 1-3.
Prerequisite: Consent of instructor. Research course on topics
of significance in the field of geography. A paper reporting the
results of this research is required. Course may be taken for
credit more than once.

GEOG 4850 (5850). Advanced GIS. Lec. 3. Credit 3.
Prerequisite: GEOG 4510 (5510). Advanced topics in GIS,
including writing of avenue scripts, writing and importing Visual
Basic scripts, customization of the interface; customization of
spatial, network, and 3D extensions of ArcView and AML.
◆ Meets Tennessee Technological University and Tennessee
Board of Regents minimum degree requirements.

Geology

Credit will not be given for both: 1)GEOL 1040 and GEOL 1310
2)GEOL 1040 and GEOL 3210, and 3)GEOL 1310 and GEOL
3210.

GEOL 1020. Field Experiences in the Geosciences. Lec. 2.
Credit 1.
This course will introduce students interested in science to the
practice of scientific research in the field and the laboratory,
with emphasis on the geosciences. Field trips and in-class
activities will stimulate critical thinking and real-world problem-
solving skills unique to the sciences. Current geosciences-
related issues will be discussed in class (e.g. Sumatra tsunami,
Himalayan earthquakes).
◆GEOL 1040. The Dynamic Earth. Lec. 3. Lab. 2. Credit 4.
Origin and classification of minerals and rocks; geologic
processes and landform development. Credit will not be given for
both: 1)GEOL 1040 and GEOL 1310, 2)GEOL 1040 and GEOL 3210,
and 3)GEOL 1310 and GEOL 3210.
◆GEOL 1045. Earth Environment, Resources, and Society. Lec. 3.
Lab. 2. Credit 4.
Application of physical geology principles to geologic hazards,
environmental pollution, and land/resource use.

GEOL 1046. Earth Environment, Resources and Society. Lec. 3.
Credit 3.
Application of physical geology principles to geologic hazards,
environmental pollution, and land/resource use. This course
cannot be taken as part of the university natural sciences
requirement and credit will not be given for both GEOL 1046
and GEOL 1045.
Introduction to the earth sciences: minerals and rocks,
resources, geologic processes, water, earthquakes, maps,
folds and faults, geologic time, continental drift, weather, and
climate. This course will not count as part of a geology
sequence. Credit will not be given for both: 1)GEOL 1040 and

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GEOL 1310, 2)GEOL 1040 and GEOL 3210, and 3)GEOL
1310 and GEOL 3210.

Prerequisite: GEOL 1040. Illustrate how biological and
geological interactions have influenced life patterns and Earth
history and how these processes continue to shape human
history today. Also, the impact of human population upon these
Earth systems.

Independent study including library and outdoor projects. No
formal classwork is required. Not intended for geosciences
majors.

Prerequisite or corequisite: GEOL 1040. Basic geologic field
techniques and map reading. Detailed study of rocks and
minerals.

Prerequisite: College algebra, eight semester hours of
chemistry. Fundamentals of oceanography integrating
chemical, geological, and physical oceanography. The
following course is offered at the Gulf Coast Research
Laboratories.

GEOL 3010. Dinosaurs. Lec. 3. Credit 3.
Recent concepts in the study of dinosaurs, including their
paleobiology, relationships to other organisms, extinction, and
distribution in space and time.

Prerequisite: GEOL 1040 and CHEM 1110. Physical properties
of minerals; identification of basic rock-forming minerals,
elements of rock classification, and megascopic properties of
common rocks.

Prerequisite: CHEM 1120, GEOL 3110 and MATH 1720.
Geometrical crystallography; determination of silicate and
nonsilicate minerals by physical properties, chemical tests, and
Xray diffraction.

GEOL (GEOG) 3200. Water Resources. Lec. 3. Credit 3.
This course deals with water as a resource basic for life on
Earth. Topics to be covered include: dams and reservoirs,
irrigation, inter-basin transfers, river channel modification, flood
control, water quality, and water law.

GEOL 3210. Geology for Engineers. Lec. 2. Lab. 2. Credit 3.
Introduction to principles of geology and practical application of
geology to engineering problems. Credit will not be given for
both: 1)GEOL 1040 and GEOL 1310, 2)GEOL 1040 and GEOL
3210, and 3)GEOL 1310 and GEOL 3210.
**GEOL 3230. Structural Geology and Tectonics.**
Lec. 3. Lab. 2. Credit 4.
Prerequisite: GEOL 1040 or GEOL 3210. The mechanisms of plate tectonics and the geologic structures that result from rock deformation; application of methods for structural analysis in the field and the lab.

**GEOL 3350. Paleobiology.**
Lec. 3. Credit 3.
Prerequisite: Junior standing and one of the following courses: GEOL 1040, GEOL 2000, BIOL 1010, BIOL 1020, BIOL 1050, BIOL 1110, or BIOL 1120. Survey of biologic and geologic principles related to preservation, variation, classification, speciation, evolution, paleoecology, and biogeography or fossil invertebrates.

**GEOL 3410. Paleontology.**
Lec. 2. Lab. 4. Credit 4.
Prerequisite: GEOL 1040 or GEOL 1045 or BIOL 1110. Systematics, morphology, stratigraphic distribution, and evolutionary significance of all major taxa of invertebrate macrofossils and selected microfossils.

**GEOL 3830. Field Geology.**
Credit 4.
Prerequisite: GEOL 1040 and GEOL 2500. Introduction to field methods involving the identification and tracing of geologic formations, aerial mapping and structure contouring. Eight hours field work per week.

**GEOL 4040. Summer Field Geology.**
Credit 4-9.
Field course in geological mapping.

**GEOL 4100. Environmental Sedimentology.**
Lec. 2. Lab. 4. Credit 4.
Prerequisite: GEOL 1040. Basic sampling and analytic techniques to determine compositions and textures of non-lithified sediments and the use of grain-sized distributions to interpret depositional process. Field trips will be taken to examine modern river and coastal deposits.

**GEOL 4110. Sedimentation and Stratigraphy.**
Lec. 3. Lab. 2. Credit 4.
Prerequisite: GEOL 1040 and GEOL 2500. Fundamental depositional processes, sedimentary structures, and facies models of siliciclastic and carbonate sedimentary rocks. Basic stratigraphy concepts, methods of correlation, and introduction to sequence stratigraphy.

**GEOL (GEOG) 4150 (5150). Geomorphology.**
Lec. 3. Lab. 2. Credit 4.
Prerequisite: GEOL 1040 and GEOL 2500 or consent of instructor. Analysis of landforms and processes that shape them.

**GEOL 4210. Advanced Historical Geology.**
Lec. 3. Credit 3.
Prerequisite: Completion of core curriculum in geology and GEOL 3410. Advanced treatment of the Earth's history concentrating on plate tectonics, evolution of the biosphere and chemical changes from the Archaean to the Holocene.

**GEOL (GEOG) 4410 (5410). Remote Sensing.**
Lec. 2. Lab. 2. Credit 3.
Prerequisite: GEOL 2500 and GEOL 3230 or consent of instructor. Principles and applications of remote sensing.

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Provides a survey of the concepts and techniques of remote sensing and image analysis for natural resources, geomorphology, and Earth surface processes.

**GEOL 4610. Optical Mineralogy and Petrography.**
Lec. 2. Lab. 4. Credit 4.
Prerequisite: GEOL 3120. Theory and use of the petrographic microscope in mineral optics, and study of rocks in thin sections using the petrographic microscope.

**GEOL 4650 (5650). Applied Geochemistry.**
Lec. 3. Credit 3.
Prerequisite: GEOL 1040 and CHEM 1110. Application of geochemistry to mineral exploration, environmental pollution, public health, and geologic hazards. Three field trips required.

**GEOL (GEOG) 4711 (5711). Hydrogeology.**
Lec. 3. Lab. 2. Credit 4.
Prerequisite: GEOL 1040 and GEOL 1045; CHEM 1120; MATH 1830 or MATH 1730 (MATH 1910 is recommended); or consent of instructor. Occurrence and movement of ground water, well hydraulics, water quality, and pollution.

**GEOL 4810-4820 (5810-5820). Special Problems.**
Credit 1-3.
Prerequisite: Major and consent of instructor. Advanced students may do independent investigations in some approved field. Course may be taken for credit more than once.

**GEOL (GEOG) 4930. Senior Thesis.**
Credit 3.
Prerequisite: Consent of instructor. Supervised independent study of an original research problem. Student is required to make a research proposal, collect data, review appropriate literature, write a paper, and present orally the results of the research problem. (Available only to geology majors.)

**GEOL (GEOG) 4931. Senior Thesis.**
Credit 3.
Prerequisite: GEOL 4930 and consent of instructor. Supervised independent study of an original research problem. Student is required to make a research proposal, collect data, review appropriate literature, write a paper and present orally the results of the research problem. (Available only to geology majors.)

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

**History (HIST)**

◆**HIST 1010. Survey of European Civilization I.**
Lec. 3. Credit 3.
Classical Greece and Rome; transformation of the West during Middle Ages; Renaissance; Reformation; rise of national states; and expansion overseas.

◆**HIST 1020. Survey of European Civilization II.**
Lec. 3. Credit 3.
Enlightenment; French Revolution; Industrialism, Liberalism, Nationalism, and Imperialism; World Wars; and Europe in mid-20th Century.
This course is designed to provide the students an enlarged perspective with which to succeed as history majors at Tennessee Technological.

◆ HIST 1110. World Civilizations I. Lec. 3. Credit 3.
Development of the human community from pre-history to the year 1500.

◆ HIST 1120. World Civilizations II. Lec. 3. Credit 3.
World History since 1500, including the development of modern science, the rise of the nation-state, European hegemony, colonialism, and anti-colonialism.

◆ HIST 1310. Science and World Cultures. Lec. 3. Credit 3.
Historical development of science in select world cultures, from the ancient world into the 20th century.

An exploration of the chronology and major themes in U.S. History with special attention to geography and terminology, for students who have not completed one year of U.S. History in high school (including international students).

Colonial heritage; Independence; Nationalism and Expansion; Rise of Democracy, Reform, and Sectionalism; and Civil War and Reconstruction.

Industrialism and Urbanism; World Power; Reform; World War I and aftermath; New Deal; World War II; Prosperity; and the Cold War.

Survey of Tennessee history from the earliest settlement to the present.

Development of scientific theories and concepts from antiquity through the 18th century.

Development of the natural sciences in the 19th and 20th centuries.

HIST 3100. Tennessee Topics. Lec. 3. Credit 3.
Prerequisite: for taking this course will be two of the following: HIST 2010, HIST 2020, or HIST 2030. Political, military, social, and cultural topics in Tennessee history.

U.S. military affairs, emphasizing war, role of officer corps, and relation of military to managerial, technological, and social change.

HIST 3410. Introduction to Historical Methods. Lec. 3. Credit 3.
Prerequisite: Permission required. An introduction to historical writing, research, criticism, methodology, and related technical skills.

HIST 3550. The Classical World. Lec. 3. Credit 3.

HIST 3710. Survey of Spanish History. Lec. 3. Credit 3.
The political, economic, and cultural development of Spain from the earliest time to the present.

HIST 3900. Environmental History. Lec. 3. Credit 3.
The history of human impact on the North American environment and the resulting effects on society.

Early American Society; Revolutionary conflict; and the Confederation and Constitution.

HIST 4020 (5020). The Young Republic, 1789-1849. Lec. 3. Credit 3.
Political, military, social and cultural history of the U.S., from the era of Washington through the "Age of Jackson" to the Mexican War.

HIST 4030 (5030). Civil War and Reconstruction, 1849-1877. Lec. 3. Credit 3.
Sectionalism and the coming war; war-time developments; and plans of reconstruction and their impact.

Industrialism, urbanism, populism, reform, and their impact.

Wilsonian reform, World War I, New Era, New Deal, World War II, with emphasis on changes in politics, the economy, and society.

HIST 4060 (5060). Postwar America, 1945-Present. Lec. 3. Credit 3.
Cold War diplomacy and society, troubled Sixties, post-Watergate politics, and contemporary cultural, economic, and social changes.

HIST 4200 (5200). The Old South. Lec. 3. Credit 3.
This course will focus upon the economic, cultural, educational, racial, and political developments in Southern society from its colonial beginnings to the Civil War and Reconstruction.

HIST 4210 (5210). The South. Lec. 3. Credit 3.
Southern life to the present, emphasizing economic, cultural, educational, racial, and political problems.
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HIST 4230 (5230). Topics in U.S. Economic History. Lec. 3. Credit 3.
Selected topics in U.S. economic history. A student may take HIST 4230 (5230) twice, provided the topic is different each time.

The frontier experience in American history, with emphasis on the trans-Mississippi West.

HIST 4290 (5290). Science and Technology in America. Lec. 3. Credit 3.
Origins and development of science and technology in the U.S. from the colonial period to the present.

The background, origins, and developments of 20th century American foreign relations.

HIST 4330 (5330). Religious Studies. Lec. 3. Credit 3.
Selected topics in religious history. A student may take HIST 4330 twice, provided the topic is different each time.

HIST 4350 (5350). Gender Studies. Lec. 3. Credit 3.
Selected topics in gender history. A student may take HIST 4350 (5350) twice, provided that the topic is different each time.

HIST 4360 (5360). U.S. Social History. Lec. 3. Credit 3.
Selected topics in U.S. Social History, ranging from the Colonial period to the present. A student may take HIST 4360 (5360) twice, provided the topic is different each time.

Public and private experiences of women in the United States from the colonial period to the present.

HIST 4390 (5390). Topics in African American Studies. Lec. 3. Credit 3.
Selected topics in African American History. A student may take HIST 4390 (5390) twice, provided the topic is different each time.

HIST 4400 (5400). Film Studies. Lec. 2. Lab. 2. Credit 3.
Selected topics in the history of films. A student may take HIST 4400 twice, provided the topic is different each time.

HIST 4440 (5440). Native American Studies. Lec. 3. Credit 3.
Prerequisite: Consent of the instructor. Selected topics in Native American history, ranging from the earliest times to the present. A student may take HIST 4440 twice, provided the topic is different each time.

Selected topics in the history of sports. A student may take HIST 4470 (5470) twice, provided that the topic is different each time.

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HIST 4520 (5520). Medieval Europe. Lec. 3. Credit 3.
Evolution of Medieval culture from the fall of the Roman Empire to the 13th century and its dissolution during the late medieval period.

HIST 4530 (5530). Renaissance and Reformation. Lec. 3. Credit 3.
Europe during age of New Learning; Renaissance and Mannerist art; 16th century Reformation; and Wars of Religion.

Europe during 17th and 18th centuries; rise of centralized states; dynastic wars and rise of modern science; and Enlightenment thought.

HIST 4550 (5550). French Revolution and Napoleon. Lec. 3. Credit 3.
Europe from 1789 to 1815, centering on events in France and political, diplomatic, and military history of the period.

European politics, diplomacy, society, war, and institutions from 1815 through World War I.

HIST 4570 (5570). World War II and the Cold War. Lec. 3. Credit 3.
Problems of European powers during inter-war years; background, causes, and results of World War II and Cold War.

HIST 4620 (5620). Russia. Lec. 3. Credit 3.
Political, cultural, social, and military history from the Kievan period to the present.

HIST 4650 (5650). England to 1688. Lec. 3. Credit 3.
Roman, Anglo-Saxon, and Medieval England; Tudor and Stuart Dynasties.

England since the Glorious Revolution, with special emphasis on the 19th and 20th centuries.

HIST 4690 (5690). British Empire and Commonwealth. Lec. 3. Credit 3.
Origin, development, and decline of the British Empire.

HIST 4710. History of Africa. Lec. 3. Credit 3.
History of Africa with emphasis on the nineteenth and twentieth centuries.

HIST 4730 (5730). The Modern Middle East. Lec. 3. Credit 3.
Consideration of the traditional cultural background of the region but with emphasis on the rapid changes experienced during the 20th century.

HIST 4740 (5740). History of Japan. Lec. 3. Credit 3.
Early Japanese history followed by a comprehensive investigation of the 20th century experience.
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Early Chinese history followed by an emphasis on the 20th
century revolutionary experience.

Overview of Vietnam, the French experience, and the U.S. war
and its impact on America, followed by developments since
1975.

Selected topics in Latin American history. A student may take
HIST 4790 (5790) twice, provided that the topic is different
each time.

Historical analysis of selected controversies in science and
their impact within and outside the scientific community.

HIST 4900. Topics. Lec. 3. Credit 3.
A formal course in any area where there is no other course
offering. May be taken twice, provided the topic is different.

HIST 4910. Directed Studies. Credit 1, 2, 3.
Prerequisite: Consent of instructor. Supervised research and
reading in any area where there is no appropriate course
offering. May be taken twice, provided the topic is different.

HIST 4990. Senior Seminar. Sem. 3. Credit 3.
Prerequisite: HIST 3410 and junior or senior standing as a
history major. Intensive experience in research, writing, and
oral presentation of a selected historical topic. May be taken
twice as the topic changes every semester.

◆ Meets Tennessee Technological University and Tennessee
Board of Regents minimum degree requirements.

Honors (HON)

HON 1010. Introduction to Honors. Credit 1.
Prerequisite: Consent of Honors Program director. An
introduction to the Honors Program and to the University,
taught by the Honors directors and outstanding faculty.

HON 2010. Special Topics. Credit 1, 2, 3.
Prerequisite: Consent of Honors Program director. A non-
departmental course on self-development for Honors students
approved by the Honors Council.

HON 2020-2090. Special Topics. Credit 1, 2, 3.
Prerequisite: Consent of Honors Program director. Non-
departmental special topics approved by the Honors Council.

Students may take this course up to three times.

Students may take this course up to three times.

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HON 2063. Director Intern. Int. 3. Credit 3.
Students may take this course up to three times.

Prerequisite: Permission of the Honors Director. Students may
take this course up to three times.

HON 4011, 4012, 4013. Colloquium. Credit 1, 2, 3.
Prerequisite: Consent of the Honors Program director. A non-
departmental course for Honors students on a topic approved
by the Honors Council, directed by a member of the Honors
faculty.

HON 4021, 4022, 4023. Directed Studies. Credit 1, 2, 3.
Prerequisite: Consent of the Honors director. A non-
departmental course of independent study available to Honors
students on an individual basis.

Prerequisite: Consent of the Honors Director. Students complete a 30-page literature review and prospectus for an
Honors thesis.

Prerequisite: Consent of the Honors Director. Students use
material from HON 4033 and complete and defend an Honors
thesis.

Human Ecology, (HEC)

Core

Prerequisite: Human Ecology major or minor. Introduction to
college: the HEC/CFS majors and student opportunities.
Review of the history, philosophy, trends, and professional
publications and associations in HEC/CFS. Exploration of
career opportunities.

HEC 1010. Life Span Development. Lec. 3. Credit 3.
Development of individuals and families across the life span
and factors that influence this development. Focus on
biological, cognitive, and socio-emotional processes.

Overview of acceptable behavior in business, social and family
environments. The diversity in protocols among selected
cultures will be examined.

HEC 1030. Introduction to Nutrition. Lec. 2. Credit 2.
Principles of basic nutrition for personal lifestyle choices and
selection of foods for promotion and maintenance of health
throughout the lifespan.

Prerequisite: Sophomore, junior or senior. Principles of
nutrition. Emphasis upon the function, food sources,
recommended intake and assimilation of each of the six
nutrient classes. HEC 1030 cannot be substituted for HEC
2020.
Cultural, social, psychological, physical, and economic aspects of dress.

HEC 2041. Aspects of Housing and Furnishings.  Lec. 3. Credit 3.
Designed environment with emphasis on interior components of the house and the impact on individuals and families.

The family as a social system. Family-community relationships including partnerships with families of children with special needs.

HEC 3011. Consumer Economics.  Lec. 3. Credit 3.
Prerequisite: Junior or senior. Management of individual and family resources with emphasis on the production, allocation and consumption of goods and services.

Prerequisite: Second semester junior or senior major in Human Ecology with 35 credits earned in Human Ecology.
Presentation of topics that integrate public policy issues and scientific knowledge related to the subject matter areas that make up the discipline of human ecology.

General Human Ecology Courses

Introduction to the fundamental principles and elements of design and their application in enhancing the quality of life for individuals and families.

Prerequisite: Consent of instructor. Courses designed to improve leadership skills of AG/HEC Ambassadors.

Prerequisite: Consent of instructor. Courses designed to improve leadership skills of AG/HEC Ambassadors.


Prerequisite: Departmental approval. Research in contemporary developments in human ecology. May be repeated. Maximum seven hours.

HEC 4920. Study Tour.  Lec. 3. Credit 1-3.
Study and observation of consumer services and product industries. May be repeated.

HEC 4960. Independent Study in Human Ecology.  Credit 1, 2, 3.
Prerequisite: Consent of instructor. Special study of an approved topic (area) within Human Ecology under the supervision of a member of the human ecology faculty. Up to six credit hours may be earned by independent study.

HEC 4990 (5990). Internship.*  Credit 3, 6, 8, 12.
Prerequisite: Human Ecology major, departmental approval. Supervised work experience. Application must be submitted to internship coordinator two semesters prior to internship semester.

HEC 4993. Field Experience-Environmental Health Science.  Credit 6.
Prerequisite: HEC 4242 (5240), HEC major, senior standing. Supervised work experience with an Environmental Health Science professional for application of sanitation, inspection, disease control, and quality control skills. Course may be repeated one time.

Child Development and Family Relations

Basic principles and theories of early childhood development, with emphasis on factors influencing typical development, the importance of developmentally appropriate practices, identification of at-risk populations, and understanding basic special needs principles and laws. Candidates will complete approximately 8.10 hours of observation.

HEC 2500. Creative Play.  Lec. 2. Credit 2.
Prerequisite: HEC 1010 or HEC 2200. Emphasis on the importance of play as related to developmental levels of young children (birth-9 years old) and to appropriate settings.

HEC 3500. Development: Middle Childhood/Adolescence.  Lec. 3. Credit 3.
Prerequisite: C in HEC 2200 or consent of instructor. Basic principles of child development from ten to eighteen years.

Parental involvement in the education of children; communication, decision-making, and the learning-valuing process.

Prerequisite: B in HEC 3500 or consent of instructor. Development and change from young adulthood through aging. Programs serving adults and the aging population.

Prerequisite: B in HEC 3700 or consent of instructor. Development, relationships and influencing factors in the eight stages of the family life cycle and in the diversity of family contexts of contemporary society.

Prerequisite: Junior or senior standing; HEC 2060. In depth study of family stress and effective coping mechanisms that relate to normative transitions and crisis events. Preparation for internships.
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**Family and Consumer Sciences Education**

**HEC 2800. Introduction to Teaching Family and Consumer Sciences.** Lec. 2. Lab. 2. Credit 3.
Responsibilities of the family and consumer sciences teacher in the secondary school. Includes observation and participation in local schools.

**HEC 3800. Materials and Methods of Teaching Family and Consumer Sciences Education.** Lec. 2. Credit 2.
Prerequisite: Admission to the Teacher Education Program and 20 hours of human ecology courses. Selection, use and evaluation of learning experiences and materials, programming planning.

Prerequisite or corequisite: HEC 3800. Observation and supervised teaching and participation in Family and Consumer Sciences Educational settings.

**HEC 3840. Occupational Family and Consumer Sciences Field Experience.** Lab. 4. Credit 1.
Prerequisite: HEC 2800. Organization and operation of Occupational Family and Consumer Sciences Programs at high school and adult levels.

**HEC 4833. Occupational Family and Consumer Sciences Field Experience.** Lab. 4. Credit 1.
Prerequisite: Advanced approval of instructor. Supervised field experience and seminar in teaching of Family and Consumer Sciences related occupations. A. Child Care Services; B. Food Services; and C. Fashion and Fabric Services.

**HEC 4834. Occupational Family and Consumer Sciences Field Experience.** Lab. 4. Credit 1.
Prerequisite: Advanced approval of instructor. Supervised field experience and seminar in teaching of Family and Consumer Sciences related occupations. A. Child Care Services; B. Food Services; and C. Fashion and Fabric Services.

**HEC 4835. Occupational Family and Consumer Sciences Field Experience.** Lab. 4. Credit 1.
Prerequisite: Advanced approval of instructor. Supervised field experience and seminar in teaching of Family and Consumer Sciences related occupations. A. Child Care Services; B. Food Services; and C. Fashion and Fabric Services.

**HEC 4871. Residency I.** Credit 5.
Corequisite: HEC 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

**HEC 4872. Professional Seminar I.** Credit 2.
Corequisite: HEC 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

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**HEC 4881. Residency II.** Credit 10.
Corequisite: HEC 4882. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

**HEC 4882. Professional Seminar II.** Credit 2.
Corequisite: HEC 4881. Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

**Food, Nutrition and Dietetics**

**HEC 2240. Food Preparation and Management.** Lec. 2. Lab. 4. Credit 4.
Prerequisite or Corequisite: HEC 1030 or HEC 2020. Scientific principles of food preparation and management including standard techniques, nutrient retention, menu planning, food purchasing, and meal service.

**HEC 3201. Community Nutrition.** Lec. 3. Credit 3.
Prerequisite: HEC 1030 or HEC 2020. Cultural food patterns; nutrition education assessment, implementation, and evaluation of community needs at local level; and the study of delivery systems of nutrition services at the local, state, federal, and international levels.

**HEC 3240. Quantity Food Production.** Lec. 2. Lab. 4. Credit 4.
Prerequisite: HEC 2240, three semester hours of math. Management and preparation of quality food in quantity, menu planning, recipe standardization, procurement, safety, sanitation, and food costing.

**HEC 3270. Nutrition in Disease.** Lec. 3. Credit 3.
Prerequisite: Grade of C or better in HEC 2020 and BIOL 2350 and admission to the HEC.DPD program. Principles of clinical nutrition relative to prevention and treatment of disease with dietary modifications.

**HEC 4110. Experimental Food Sciences.** Lec. 2. Lab. 4. Credit 4.
Prerequisite: HEC 2240, CHEM 1210 or CHEM 1010 and CHEM 1020, and MATH 1530. Principles and practices in foods research.

**HEC 4200 (5200). Advanced Nutrition.** Lec. 3. Credit 3.
Prerequisite: HEC 2020, CHEM 3005, and BIOL 2350, admission to the HEC.DPD program. Interrelationships of nutrients in metabolism at the cellular level. Current issues in nutrition.

**HEC 4210. Medical Terminology for the Human Sciences.** Credit 1.
Prerequisite: Anatomy & Physiology course. This course provides students with an understanding of the terminology used in health care and wellness programs.
HEC 4220 (5220). Research in Food Science and Nutrition. Credit 2.
Prerequisite: Departmental approval. Independent work for students with special ability. May be repeated for a total of six credits when content varies.

Prerequisite: HEC 2240 and HEC 3240. Legal issues in foodservice management, including evaluation of food and nutrition laws and regulations.

HEC 4242 (5240). Food Systems Administration. Lec. 3. Lab. 2. Credit 3.
Prerequisite: HEC 2240 and HEC 3240. Systems approach to food service management; facilities, financial, personnel, equipment, and legal issues in food service.

HEC 4250 (5250). Field Experience in School Food Service.* Credit 4.
Prerequisite: HEC 3240 and HEC 4242 (5240). Work experience in school food service management. Supervision by instructor and Tennessee-certified School Food Service Supervisor.

HEC 4271 (5271). Medical Nutrition Therapy. Lec. 3. Credit 3.
Prerequisite: HEC 3270. Prerequisite or corequisite: HEC 4200. Medical nutrition therapy and nutritional status assessment.

Prerequisite: HEC 4200, HEC 4271, HEC major, and senior standing. Application of medical nutrition therapy in a supervised environment and practice setting. Preparation for HEC 4994 Field Experience.

Basic principles of wellness promotion through exercise and nutrition. Assessment and intervention strategies are included.

HEC 4992. Field Experience—Food Systems.* Credit 3.
Prerequisite: HEC 4242 (5240), HEC major, senior standing. Supervised work experience in a food related organization for application of food service, inspection, or quality control skills. Course may be repeated one time.

HEC 4994. Field Experience—Health Care.* Credit 3.
Prerequisite: HEC 4242, HEC 4272, and senior standing. Supervised work experience in a health care facility to develop medical nutrition therapy skills. Course may be repeated one time.

Housing and Design

Prerequisite: Departmental approval. Applied service learning and work experience in a housing and design setting.

Prerequisite: HEC 2041. Basic architectural drafting including graphics and symbols for residential floor plans and blueprint reading.

HEC 2431. Residential Design I. Lec. 2. Lab. 2. Credit 3.
Prerequisite: Grade of C or better in HEC 2421. Fundamental execution of residential design problems including perspectives, floor plans and renderings using both hand and computer techniques.

Prerequisite: HEC 2421. An introduction to concepts and methods of computer-aided design in residences.

HEC 2460. Interior Architecture Codes and Standards. Lec. 2. Credit 2.
Prerequisite: HEC 2421. Survey of interior architecture codes and standards including their application and implementation as required by law.

HEC 3420. Housing. Lec. 3. Credit 3.
Prerequisite: HEC 2041. Evaluation of housing in terms of family needs, economics, construction, legislation, and technological developments.

HEC 3431. Residential Design II. Lec. 2. Lab. 2. Credit 3.
Prerequisite: Grade of C or better in HEC 2431. Space planning of residences with emphasis on presentations through floor plans, elevations, perspectives, and sample boards.

HEC 4450. Commercial Design. Lec. 2. Lab. 2. Credit 3.
Prerequisite: Three credits in Math, SPCH 2410, and HEC 2440, Grade of C or better in HEC 3431. Various media for planning and rendering interior spaces for the commercial environment. Portfolio preparation and visual developmental skills are attained. Submission of resume and portfolio.

Prerequisite: HEC 2041. Overview of architecture, interior design, and furnishings from Ancient Egyptian period to present.

Merchandising and Design

Prerequisite: HEC 2031 and Human Ecology Major or Fine Art major-Fiber Arts concentration. Construction and analysis of apparel and home décor.

Prerequisite: HEC 1300 or Fine Arts major-Fiber Arts concentration. Evaluation and use of tailoring techniques in the selection, fitting, and construction of garments.
Prerequisite: Departmental approval. Work experience in a fashion merchandising setting.

Prerequisite: Must be Human Ecology/HEHO major; HEC 2041; and consent of instructor. Applied service learning and work experience in a housing and design setting.

Prerequisite: HEC 1300 or Fine Arts major-Fiber Arts concentration. Apparel design from sketching to pattern making to garment completion.

HEC 3310. Textiles I.  Lec. 2. Lab. 2. Credit 3.
Prerequisite: Grade of C or better in HEC 2031, CHEM 1010, CHEM 1020. Fibers, yarns, fabrics, finishes, and applied design related to the selection, evaluation, use and care of textile products.

HEC 3320. Textiles II.  Lec. 2. Lab. 2. Credit 3.
Prerequisite: Grade of C or better in HEC 3310. Problems involving fiber and fabric identification, textile performance, end-use and care, legislation and standardization in the textile/apparel industry.

HEC 3350. Merchandising I.  Lec. 3. Credit 3.
Prerequisite: HEC 2031. Introduction to the merchandising of apparel and home furnishing products.

Prerequisite: HEC 2031, HEC 3350. Practice in merchandise and consumer information presentation.

HEC 4320. Merchandise Promotion and Advertising.  Lec. 3. Credit 3.
Prerequisite: HEC 3350. Communication of product information through special promotions and advertisements.

Prerequisite: HEC 2031. Study of dress and adornment from ancient times to present day.

HEC 4360. Merchandising II.  Lec. 3. Credit 3.
Prerequisite: HEC 3350, MATH 1010. Principles of merchandising including merchandise planning and decision making. Emphasis on the role of the buyer in case studies.

*See the HEC 4990 (5990) Internship Manual, Additional Information Section, regarding criteria including student eligibility and responsibilities and work requirements for HEC Internships and Field Experiences.

Instructional Leadership (INSL)

Special topics concerning school law and legal issues in education presented in workshop and seminar formats. Students may repeat the course for credit for a maximum of three credit hours.

Interdisciplinary Studies (LIST)

LIST 1091. Special Topics.  Credit 1.
Consent of advisor and Dean of Interdisciplinary Studies.

LIST 1092. Special Topics.  Credit 2.
Consent of advisor and Dean of Interdisciplinary Studies.

LIST 1093. Special Topics.  Credit 3.
Consent of advisor and Dean of Interdisciplinary Studies.

LIST 4091, 4092, 4093. Special Topics.  Credit 1, 2, 3.
Prerequisite: Senior standing. Consent of advisor and Dean of Interdisciplinary Studies. Upper division level study in a specific topic not commonly found in a discipline on campus, not to include work experience.

LIST 4850. Topics in Organizational Development.  Credit 3.
Consent of faculty; concentration on a topic in Organization Development. May be repeated with different topics. No more than nine hours of special topics may be used for degree.

International Business and Cultures (IBC)

IBC 4980. Practicum.  Credit 3-10.
Prerequisite: Junior or senior standing and consent of advisor. Semester-long, practical experience with international trade or commerce. Credit assigned by advisor and monitored by the IBC Executive Committee.

IBC 4990 develops students’ understanding and knowledge of business practices in a foreign nation(s). Topics covered include social and cultural differences, national and regional political forces that influence business practices, and the internal economic environment and its impact on marketing, finance, organizational structure, and operations of businesses in the host country (countries).

Journalism (JOUR)

(O) and (E) Denote Odd and Even Years Respectively.

JOUR 2200 is a prerequisite for all other journalism courses.

Mass communications in a democracy. Trends in media, the government as friend and foe, legal problems, and the invasion of privacy. May include experience on the student media.

Prerequisite: JOUR 2200 is a prerequisite for all other journalism courses. Basics of gathering and writing news. Introduction to copy editing and the Associated Press Stylebook. May include experiences on the student media.
JOUR 3350. Newspaper Production and Design.-- Fall.  
Lec. 3. Credit 3.  
Typography and current trends in newspaper production and design.

JOUR 3370. Fundamentals of Photojournalism.  
Lec. 3. Credit 3.  
An introduction to the technical, aesthetic and ethical aspects of digital photography with an emphasis on photojournalism and visual storytelling.

JOUR 3400. Introduction to Broadcast Journalism.  
Lec. 3. Credit 3.  
Prerequisite: JOUR 2200 or JOUR 2220. Electronic media with emphasis on news writing for radio and television. May include experience on the campus radio.

JOUR 3460. Introduction to Public Relations.-- Spring (E).  
Lec. 3. Credit 3.  
Career opportunities in public relations. Historical, philosophical, and ethical aspects.

JOUR 3740. Advertising Copy and Layout.-- Fall.  
Lec. 3. Credit 3.  
Advertising in current publications with emphasis on trends in copy and layout.

JOUR 3760. History and Law of Journalism.-- Fall (E).  
Lec. 3. Credit 3.  
The history and law of the press from colonial times to the present. Emphasis on major trends, persons, events, and laws.

JOUR (PC) 4230. Free Lance Writing.-- Spring.  
Lec. 3. Credit 3.  
Writing and marketing of feature stories, commentaries, and articles.

JOUR 4360 (5360). Magazine Production and Design.-- Spring.  
Lec. 3. Credit 3.  
Current trends in magazine production and design.

JOUR 4460 (5460). Public Relations/Cases and Practices.-- Fall (O).  
Lec. 3. Credit 3.  
Prerequisite: JOUR 3460. Practical aspects of public relations emphasized. Case studies considered. Builds on knowledge and expertise acquired in JOUR 3460.

JOUR 4710. Literary Journalism.  
Lec. 3 Credit 3  
Prerequisite: ENGL 1020 and JOUR 2220. Instruction in the form of the literary essay..both short and book length--through both reading and writing literary essays. Course may be repeated for credit provided content is different.

JOUR 4820 (5820). Advanced Reporting.-- Fall.  
Lec. 3. Credit 3.  
Prerequisite: JOUR 2220. Writing and reporting for the commercial media. Students may serve as reporters for the campus newspaper.

JOUR 4830 (5830). Feature Writing.  
Lec. 3. Credit 3.  
Prerequisite: JOUR 2220. Recommended: JOUR 4820. An introductory course in the writing and marketing of feature stories, commentaries and articles for the print and digital media.

JOUR 4843 (5843). Special Problems.  
Credit 3.  
Prerequisite: Senior standing or consent of instructor. Independent work in mass media research and/or writing related to student academic and career goals.

JOUR 4846 (5846). Special Problems.  
Credit 6.  
Prerequisite: Senior standing or consent of instructor. Independent work in mass media research and/or writing related to student academic and career goals.

JOUR 4849 (5849). Special Problems.  
Credit 9.  
Prerequisite: Senior standing or consent of instructor. Independent work in mass media research and/or writing related to student academic and career goals.

JOUR 4853 (5853). Internship.  
Credit 3.  
Part-time or full-time employment in a business, industrial, or institutional communications setting related to student academic and career goals.

JOUR 4856 (5856). Internship.  
Credit 6.  
Part-time or full-time employment in a business, industrial, or institutional communications setting related to student academic and career goals.

JOUR 4859 (5859). Internship.  
Credit 9.  
Part-time or full-time employment in a business, industrial, or institutional communications setting related to student academic and career goals.

JOUR 4930 (5930). Advanced Copy Editing.-- Spring.  
Lec. 3. Credit 3.  
Prerequisite: JOUR 2220. Additional training in editing copy. Laboratory work may be required on the university student newspaper.

JOUR 4940 (5940). Technical Editing.-- Spring.  
Lec. 3. Credit 3.  
Prerequisite: JOUR 4930, ENGL 3250, and ENGL 4970. Principles and practices of technical editing.

Library Science (LSCI)

LSCI 4000 (5000). Information Sources.  
Lec. 2. Credit 2.  
Selection, evaluation, and use of standard and current information sources for teachers, librarians, and children.

LSCI (READ) 4020 (5020). Storytelling and Traditional Literature.  
Lec. 3. Credit 3.  
Storytelling techniques and literature presentation through storytelling.

LSCI 4400 (5400). Audio-Visual Aids to Teaching.  
Lec. 2. Credit 2.  
Prerequisite: EDPY 2200. Survey of educational media available to educators with emphasis given to effective utilization.
LSCI 4500 (5500). Children's Literature.  
Lec. 3. Credit 3.  
Prerequisite: Full admission to the Teacher Education Program. Survey of elementary school library materials for children, including classic and modern titles.

LSCI (ECED) 4530 (5530). Books and Related Materials for Infants and Toddlers.  
Lec. 1. Credit 1.  
Survey of developmentally appropriate books and materials for infants and toddlers.

LSCI (READ) 4540 (5540). Multiethnic Literature for Infants, Toddlers and Preschoolers.  
Lec. 1. Credit 1.  
Introduction to preschool trade books and related materials reflecting an understanding of multiethnicity.

LSCI (READ) 4550 (5550). Multiethnic Literature for Children.  
Lec. 1. Credit 1.  
Introduction to children's trade books and related materials reflecting an understanding of multiethnicity.

LSCI (READ) 4560 (5560). Multiethnic Literature for Adolescents and Adults.  
Lec. 1. Credit 1.  
Introduction to adolescent and adult trade books and related materials reflecting an understanding of multiethnicity.

LSCI (READ) 4570 (5570). Books and Related Materials for Adolescents and Adults.  
Lec. 3. Credit 3.  
Survey of books and materials for middle level, high school students, and adults focusing on techniques to assist in reading these materials with understanding.

LING (ENGL) 4511 (5511). Introduction to Descriptive Linguistics.  
Lec. 3. Credit 3.  
Introduction to descriptive analysis of language: phonology, morphology, lexicon, and syntax.

LING (ENGL) 4521 (5521). History of the English Language.  
Lec. 3. Credit 3.  
History of the language from its origins to the present; emphasis upon historical development of English sounds, word structure, and syntax.

LING (ENGL) 4531 (5531). Grammar and Language.  
Lec. 3. Credit 3.  
Grammatical structure of English in relation to dialect and register with some emphasis on historical and potential changes in grammar.

LING (ENGL) 4541 (5541). Topics in Linguistics/Language.  
Lec. 3. Credit 3.  
Examination of specific aspects of language and/or linguistic study, such as Old and Middle English, the language of dialect literature or American English dialects. Course may be repeated provided the content is different each time.

MIT 1110. Introduction to Manufacturing Technology.  
Lec. 2. Lab. 2. Credit 3.  
Introduction to the materials and processes used in the manufacturing of metals, ceramics, polymers, and wood products.

MIT 1835. Applications of Math in Engineering Technology Lab.  
Lab. 2. Credit 1.  
Prerequisite: MATH 1830, ENGR 1120. Use of integral and differential calculus with numerical applications for engineering technology.

Lec. 2. Credit 2.  
Occupational safety and health hazards associated with man-machine systems with emphasis on recognition, evaluation, and control of such hazards.

MIT 2063. Metal Manufacturing Technology.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: ENGR 1110, MIT 1110 and MATH 1730. Machine tool functions and use of hand tools and machines used to forming metals.

Lec. 2. Lab. 2. Credit 3.  
Prerequisite: MATH 1730 and PHYS 2010. This course is an introduction to concurrent force analyses, stresses, strains and combined stresses in structures and machines components.

MIT 2640. Aviation Ground Instruction I.  
Lec. 3. Credit 3.  
Basic theory and principles of flight, aircraft systems, and material for instruments. Completion of Ground School Certification Examination.

MIT 2650. Aviation Flight Instruction.  
Lec. 1. Lab. 4. Credit 3.  
Prerequisite: MIT 2640. This course will cover only the aeronautical knowledge and skills necessary to meet the requirements of a Private Pilot FAA Certificate. To meet FAA flight requirements, students should arrange and pay for their own flight lessons.

MIT 3000. Principles of Metal Casting.  
Lec. 1. Lab 2. Credit 2.  
Prerequisite: ENGR 1110, MIT 1110 and ME 3110 Principles of molding and casting aluminum, brass and gray iron. Use of cores, patterns and machine molding included.

MIT 3010. Foundry Technology.  
Lec. 3. Credit 3.  
Prerequisite: MIT 3000. An in-depth study of foundry operations including modern practices, equipment, and materials.

MIT 3060. Computer Numerical Control Machining Practices.  
Lec. 1. Lab. 4. Credit 3.  
Prerequisite: ENGR 1120 and MIT 2063. Theory of numerical control equipment and programming for machine setup and operation of CNC equipment.
MIT 3080. Plastics Processing and Applications.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: Junior standing, CHEM 1010. Studies in the use of plastic-related products with laboratory activities.

MIT 3130. Maintenance Technology I.  
Lec. 3. Credit 3.  
Prerequisite: Junior standing, MIT 1110. Principles of organizing and controlling maintenance operations in industrial plants.

MIT 3200. Applied Electricity and Electronics.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: PHYS 2020, MATH 1730 and MATH 1910 or 1830. Fundamentals of electricity and electronics, basic circuits, motors, generators and power distribution, advanced electronic circuits, semiconductors and power supplies, electronic communication, and data systems.

MIT 3301. CAD for Technology.  
Lec. 1. Lab. 2. Credit 2.  
Prerequisite: ENGR 1110. CAD techniques for industrial applications with laboratory experiences.

Lec. 2. Lab. 2. Credit 3.  
Prerequisite: MIT 2400, MIT 3301, ME 3110, PHYS 2010. Static and dynamic properties of materials. Principles of machine elements calculations, components selection, assembly, and lubrication.

MIT 3460. Welding Technology.  
Lec. 1. Lab. 2. Credit 2.  
Prerequisite: Junior standing. Welding materials using current welding processes and techniques.

MIT 3560. Advanced Welding.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: MIT 2063. An in-depth experience in welding and inspection procedures.

Lec. 2. Credit 2.  
Prerequisite: Junior standing, MIT 1110. This is an experiential learning course where the students participate in solving an industrial problem. This course requires the application of computer-aided design, bill of materials, manufacturing processes, process design, writing a report, and presentation of the results.

Lec. 2. Credit 2.  
Prerequisite: Junior standing, MIT 1110. Introduction to concepts and the practice of methods improvement and work measurement for lean manufacturing.

Lec. 2. Credit 2.  
Prerequisite: Junior Standing, MIT 1110. Using 6-Sigma methods for controlling the quality of materials and products in production systems.

MIT 4010. Technical Communications.  
Lec. 3. Credit 3.  
Prerequisite: Senior standing. The basic methods used in industrial communications as related to technology with an emphasis on oral and written communications.
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Integrated treatment of tool design, specification and application by the use of standard tooling data.

**MIT 4610. Engineering Technology Seminar.**
Lec. 1. Credit 1.
Prerequisite: Senior standing. Discussion and preparations of problems and topics pertinent to engineering technology.

**MIT 4620. Senior Projects.**
Lec. 2. Lab. 2. Credit 3.
Prerequisite: MIT 3403, MIT 4200. This course is the capstone experience, which requires both teamwork and individual skills in identifying and solving an industrial problem. It requires the application of design, manufacturing processing, project management plan and public presentation of results.

**MIT 4990. Special Problems.**
Lec. 1. Lab. 4. Credit 3.
Prerequisite: Senior standing. Investigations of industrial topics in the students area of interest. May not be repeated for improvement of grade.

### Marketing (MKT)

Enrollment in junior- and senior-level MKT courses requires junior standing. All business majors must have completed the Basic Business Program.

**MKT 3310. Services Marketing.**
Lec. 3. Credit 3.
This course will focus on service organizations, and services marketing issues to make students aware of the unique challenges involved in marketing and managing organizations in sections such as finance, health care, entertainment, hospitality, professional services, retailing, education and transportation. Some of the specific topics will include understanding service processes, learning how to manage service encounters, consumer behavior in service settings, complaint handling, pricing and positioning of services, and balancing demand and capacity.

**MKT 3400. Principles of Marketing.**
Lec. 3. Credit 3.
Prerequisite: ECON 2010. Marketing in an economic system, including marketing strategy and marketing mix variables available to the marketing manager.

**MKT 3430. Advertising.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400. Techniques and methods of advertising, including an analysis of major media. Emphasis on case studies and special projects involving integrated advertising campaigns and trends.

**MKT 3650. Sales Management.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400. Responsibilities and techniques of managing the sales force. Course includes case studies.

**MKT 3900. Entrepreneurship/Small Business.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400 or consent of instructor. An introduction to the process of new venture creation and the challenges of operating and growing a small business.

**MKT 4100. International Marketing.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400. Focuses on the study of consumer behavior and buying cultures in all major regions of the world and relates the information to the creation of international marketing plans and strategies.

**MKT 4500. Retail Marketing Management.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400. Theory and practice of modern retail marketing. Included are merchandising, budgeting, store location and design, retail pricing decisions, product sourcing, and promotion strategies.

**MKT 4530. Consumer Behavior.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400 (Principles of Marketing) or permission of instructor. This course provides a comprehensive interdisciplinary framework of consumer behavior concepts and processes. It further enables students to apply what is learned to market analysis, product/service design, strategy and control of marketing programs.

**MKT 4550. Business Marketing Management.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400. Study of business marketing management including industrial buying practices, governmental buying, business services, institutional marketing, modern purchasing practices, TQM decision making, and inventorying, particularly JIT.

**MKT 4620 (5620). Marketing Research.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400 and ECON 3610. Information systems and traditional research through text and cases.

**MKT 4730 (5730). Marketing Strategy.**
Lec. 3. Credit 3.
Prerequisites: MKT 3400, BMGT 3510, and two marketing courses beyond MKT 3400. The role of the modern marketing manager in making marketing decisions and selecting strategies. Includes case studies.

**MKT 4900. Special Topics in Marketing.**
Lec. 3. Credit 3.
Prerequisite: MKT 3400 and approval of the instructor. Selected current topics in marketing.

**MKT 5200. Basic Marketing.**
Lec. 3. Credit 3.
Structure of markets, techniques and tools available to the marketing manager, motivation of buyers.

### Mathematics (MATH)

**MATH 1010. Introduction to Contemporary Mathematical Ideas.**
Lec. 3. Credit 3.
Mathematics as applied to real-life problems selected from such topics as preference schemes for voting, fair division and apportionment methods, routing and scheduling problems, analysis of graphs, growth, and symmetry and counting problems.

**MATH (CSC) (PHYS) 1020. First-Year Connections.**
Rec. 2. Credit 1.
This course is intended as a bridge course for students entering TTU from high school. The course is designed to strengthen the student’s connection to TTU, the College of Arts
MATH 1130. College Algebra. Lec. 3. Credit 3.
Review of algebra and coordinate geometry; functions; polynomial, rational, exponential, and logarithmic functions; systems of equations; binomial formula; counting (multiplication principle, permutations, and combinations); and conics. Credit towards graduation will not be given for MATH 1130 and MATH 1710 or for MATH 1130 and MATH 1730.

MATH 1710. Pre-calculus I. Lec. 3. Credit 3.
Review of algebra; relations and functions and their graphs, including polynomial and rational functions; conic sections; inequalities; arithmetic, and geometric sequences and series. Credit will not be given for both MATH 1710 and MATH 1730.

MATH 1720. Pre-calculus II. Lec. 3. Credit 3.
Circular functions and radian measure, graphs of the trigonometric functions, trigonometric identities, and equations, the inverse trigonometric functions, polar coordinates. Applications involving triangles, vectors in the plane, and complex numbers. Credit will not be given for both MATH 1720 and MATH 1730.

MATH 1730. Pre-calculus Mathematics. Lec. 5. Credit 5.
Prerequisite: Two years of high school algebra, one year of high school geometry, and 12 weeks of trigonometry. Review of algebra and trigonometry; relations and functions and their graphs, including polynomial and rational functions; conic sections; inequalities; polar coordinates; complex numbers; and advanced topics in algebra. Credit will not be given for both MATH 1730 and any of MATH 1710 and MATH 1720.

Prerequisite: ACT mathematics score of 25 or above and three years of high school mathematics, including algebra and geometry; or, special permission of the Mathematics Department; or, C or better in MATH 1130 or MATH 1710 or equivalent. A survey of limits, continuity, and the differential and integral calculus with applications in business, economics and the life sciences.

Prerequisite: ACT mathematics score of 27 or above and four years of high school mathematics, including algebra, geometry, trigonometry, and advanced or pre-calculus mathematics, or special permission of the Mathematics Department; or C or better in MATH 1730; or C or better in MATH 1720 and MATH 1710; or equivalent. Limits, continuity, and derivatives of functions of one variable. Applications of differentiation and introduction to the definite integral.

MATH 1911. Calculus I Honors Seminar. Lab. 1. Credit 0.
Corequisite: Concurrent enrollment in MATH 1910. An ACT score of 30 or higher is also recommended. Selected topics to add depth to the understanding of the material in MATH 1910. Honors students can receive honors credit for MATH 1910 by successfully completing both MATH 1910 and MATH 1911.

Prerequisite: C or better in MATH 1910; or equivalent AP credit for MATH 1910. Integration techniques, applications of the definite integral, polar coordinates, parametric equations, sequences, and series.

MATH 1921. Calculus II Honors Seminar. Lab. 1. Credit 0.
Corequisite: Concurrent enrollment in MATH 1920. A grade of A in MATH 1910 is also recommended. Selected topics to add depth to the understanding of the material in MATH 1920. Honors students can receive honors credit for MATH 1920 by successfully completing both MATH 1920 and MATH 1921.

Prerequisite: C or better in MATH 1910. Introduction to basic operations, determinants, inverses, systems of linear equations, bases and dimension of Euclidean spaces, linear transformations, eigenvalues, and eigenvectors.

Prerequisite: C or better in MATH 2010 or concurrent
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enrollment in MATH 2010. This lab complements matrix theory taught in MATH 2010 by providing students with the experience in applying matrix methods and modern computer software such as Matlab or Maple to solve various computational problems in mathematics, engineering, or sciences. The course will be taught in a computer laboratory. Previous knowledge of the computer software is not necessary.

Prerequisite: C or better in MATH 1920; or AP credit for MATH 1910 and MATH 1920. Analytic geometry and vectors, differential calculus of functions of several variables, multiple integration, and topics from vector calculus.

MATH 2120. Differential Equations. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 1920. First order equations, linear equations of higher order, power series solutions (including Frobenius method), Laplace transforms, other topics. It is recommended but not required that students take MATH 2010 before taking MATH 2120.

Prerequisite: C or better in MATH 1920. Topics to be chosen from algebra of sets and relations, functions, algebras, graphs and digraphs, monoids and machines, groups and subgroups, computer arithmetic, binary codes, logic, and languages.

MATH 3000. Selected Topics in Mathematics. Lec. 1. Credit 1.
Prerequisite: C or better in MATH 1920 and consent of instructor. Lectures on and discussion of topics from upper level mathematics to be selected by the instructor in a setting with less structure than in a traditional class.

MATH 3070. Statistical Methods I. Lec. 3. Credit 3.
Prerequisite: Recommended C or better in MATH 1130. Introduction to parametric statistical methods with some non-parametric alternatives, sampling, probability, Type I and Type II error, sample size estimation, confidence interval estimation, test of hypotheses using normal, Student's t, Snedecor's F, Chi-square and the binomial distributions, linear regression, analysis of variance, and data analysis utilizing statistical software.

MATH 3080. Statistical Methods II. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3070. Introduction to parametric statistical methods with some non-parametric alternatives, sampling, probability, Type I and Type II error, sample size estimation, confidence interval estimation, test of hypotheses using normal, Student's t, Snedecor's F, Chi-square and the binomial distributions, linear regression, analysis of variance, and data analysis utilizing statistical software.

Prerequisite: C or better in MATH 1920. A rigorous treatment of elements of logic and set theory including propositional calculus (statements, connectives, conditionals, and negation), quantifiers, sets and operations on sets, mappings, equivalence relations, and mathematical induction. Students are expected to work in an abstract setting using precise definitions and formal proofs.

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MATH 3430. College Geometry. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3400. A rigorous development of geometry from first concepts using the metric approach. Topics include constructions and hyperbolic geometry.

Prerequisite: C or better in MATH 1920. Probability, random variables, discrete and continuous distributions and their simulation, elementary sampling theory, and estimation with an overall emphasis on simulation of random processes (Not allowed for mathematics majors after having taken MATH 4480.)

Introduction to randomization, unconditional and conditional probability, independence, and concepts of random variables. Distributions and density functions, moments and moment generating functions, univariate and multivariate random variables, random process concepts, spectral characteristics of random processes, and linear systems with random inputs.

MATH 3810. Complex Variables. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2110. Complex numbers, calculus of complex variables, analytic functions, Cauchy's Theorem, series, the Residue Theorem, and applications.

MATH 3910. Independent Study. Credit 1-3.
Prerequisite: Consent of instructor. Readings and study under the supervision of a qualified staff member.

MATH 4010 (5110). Modern Algebra I. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2010 or equivalent and C or better in MATH 3400. Groups and subgroups including cyclic, abelian, finite; permutation groups, group homomorphisms, cosets and Lagrange's Theorem, normal subgroups and factor groups. Rings including integral domains, unique factorization domains and Euclidean domains, ideals and factor rings, ring homomorphisms, fields and their extensions, geometric constructions.

MATH 4020 (5020). Modern Algebra II. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 4010. Groups and subgroups including cyclic, abelian, finite; permutation groups, group homomorphisms, cosets and Lagrange's Theorem, normal subgroups and factor groups. Rings including integral domains, unique factorization domains and Euclidean domains, ideals and factor rings, ring homomorphisms, fields and their extensions, geometric constructions.

MATH 4050 (5050). Number Theory. Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3400 or consent of instructor. Properties of integers, division algorithms, prime numbers, diophantine equations, and congruences.

Prerequisite: C or better in MATH 3400 or consent of instructor. Rigorous treatment of functions of one and several
variables, improper integrals, sequences, infinite series, uniform convergence, and applications. Students are expected to improve their ability to work in an abstract setting using precise definitions and formal proofs and to present their work in class.

**MATH 4120 (5120). Advanced Calculus II.**
Lec. 2. Rec. 2. Credit 3.
Prerequisite: C or better in MATH 4110 (5110). Rigorous treatment of functions of one and several variables, improper integrals, sequences, infinite series, uniform convergence, and applications. Students are expected to improve their ability to work in an abstract setting using precise definitions and formal proofs and to present their work in class.

**MATH 4210 (5210). Numerical Analysis I.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2120. Iterative methods for nonlinear equations, computational error analysis, convergence of iterative techniques, interpolation, numerical differentiation and integration, approximate solutions of initial-value problems, boundary-value problems, and nonlinear systems, and direct and iterative methods for linear systems.

**MATH 4220 (5220). Numerical Analysis II.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2120 or consent of instructor. Iterative methods for nonlinear equations, computational error analysis, convergence of iterative techniques, interpolation, numerical differentiation and integration, approximate solutions of initial-value problems, boundary-value problems, and nonlinear systems, and direct and iterative methods for linear systems.

**MATH 4250 (5250). Advanced Ordinary Differential Equations I.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2110 and MATH 2120. Systems of ordinary differential equations, matrix methods, approximate solutions, stability theory, basic theory of nonlinear equations and differential systems, trajectories, phase space stability, and construction of Liapunov functions.

**MATH 4260 (5260). Advanced Ordinary Differential Equations II.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 4250 (5250). Systems of ordinary differential equations, matrix methods, approximate solutions, stability theory, basic theory of nonlinear equations and differential systems, trajectories, phase space stability, and construction of Liapunov functions.

**MATH 4310 (5310). Introduction to Topology I.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3400. Topological spaces, continuity, connectedness, compactness, separation axioms, function spaces, and fundamental groups.

**MATH 4320 (5320). Introduction to Topology II.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 4310 (5310). Topological spaces, continuity, connectedness, compactness, separation axioms, function spaces, and fundamental groups.

**MATH 4340 (5340). Linear Algebra II.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 4530 (5530). A theoretical study of vector spaces, bases and dimension, subspaces, linear transformations, dual spaces, eigenvalues and eigenvectors, inner product spaces, spectral theory, duality, and quadratic and bilinear forms.

**MATH 4350 (5350). Introductory Combinatorics.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3400 or consent of instructor. Topics to be covered include permutations, combinations, multisets, partitions, recurrence relations, generating functions, and the principle of inclusion-exclusion.

**MATH 4360 (5360). Graph Theory.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3400 or consent of instructor. Fundamental concepts of undirected and directed graphs, trees, connectivity, traversability, colorability, network flows, and matching theory.

**MATH 4410 (5410). Differential Geometry.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2110, MATH 2010 and MATH 3400. Geometry of curves and surfaces in three dimensional space. Calculus on surfaces, curvature, and Riemannian geometry.

**MATH 4470 (5470). Probability and Statistics I.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2110. Mathematical foundations of elementary statistical methods, application and theory, probability in discrete and continuous distribution, correlation and regression, sampling distributions, and significance tests.

**MATH 4480 (5480). Probability and Statistics II.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 4470 (5470). Mathematical foundations of elementary statistical methods, application and theory, probability in discrete and continuous distribution, correlation and regression, sampling distributions, and significance tests.

**MATH 4510 (5510). Advanced Mathematics for Engineers.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2110 and MATH 2120. Fourier series, Sturm-Liouville problems, orthogonal functions, Legendre polynomials, Bessel functions, separable partial differential equations (e.g. heat, wave and Laplace equations) and other topics.

**MATH 4530 (5530). Linear Algebra I.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 2010 and MATH 3400. A theoretical study of vector spaces, bases and dimension, subspaces, linear transformations, dual spaces, eigenvalues and eigenvectors, inner product spaces, spectral theory, duality, and quadratic and bilinear forms.

**MATH 4540 (5540). Linear Algebra II.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 4530 (5530). A theoretical study of vector spaces, bases and dimension, subspaces, linear transformations, dual spaces, eigenvalues and eigenvectors, inner product spaces, spectral theory, duality, and quadratic and bilinear forms.

**MATH 4610 (5610). History of Mathematics I.**
Lec. 3. Credit 3.
Prerequisite: C or better in MATH 3400. The development of mathematics and its relation to the development of civilization prior to the beginnings of calculus.
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MATH 4620 (5620). History of Mathematics II.  
Lec. 3. Credit 3.  
Prerequisite: C or better in MATH 3400. History of mathematics from the beginnings of calculus through the modern times.

MATH 4710 (5710). Vector Analysis.  
Lec. 3. Credit 3.  
Prerequisite: C or better in MATH 2110. The algebra and the differential and integral calculus of vectors and applications to geometry and mechanics.

MATH 4750 (5750). Category Theory of Sets.  
Lec. 3. Credit 3.  
Prerequisite: C or better in MATH 3400 (or consent of instructor for MATH 5750). Abstract sets and mappings, categories, sums, universal property, monomorphisms and parts, finite inverse limits, colimits, epimorphisms, the Axiom of Choice, mapping sets and exponentials, covariant and contravariant functoriality of function spaces, Cantor's diagonal argument, powers sets, variable sets, models of additional variations, and selected applications.

MATH 4850 (5850). Computational Algebraic Geometry I.  
Lec. 3. Credit 3.  
Prerequisite: C or better in MATH 2120 and C or better in MATH 3400 or equivalent (or consent of instructor for MATH 5850). Additional recommended prerequisite: MATH 3510 or any other 4000/5000-level mathematics course in which proofs are required. Affine varieties and polynomial ideals, Groebner bases, elimination theory, Hilbert's Nullstellensatz, Zariski closure, and decomposition into irreducible varieties.

MATH 4860 (5860). Computational Algebraic Geometry II.  
Lec. 3. Credit 3.  
Prerequisite: C or better in MATH 4850 (5850). Polynomial and rational functions on a variety, projective varieties, the dimension of a variety, selected applications in robotics, automatic theorem proving, and invariant theory of finite groups.

MATH 4910-4920 (5910-5920). Directed Readings.  
Credit 1-3.  
Prerequisite: Consent of instructor. These courses provide an opportunity for individual reading and study under the supervision of a qualified staff member.

MATH 4950 (5950). Topics in Mathematics.  
Lec. 3. Credit 3.  
Prerequisite: Consent of instructor. A formal course in any area where there is no other course offering. May be taken more than once provided that the topic is different.

Lec. 2. Credit 2.  
Prerequisite: ENGR 1120 and MATH 1910. An introduction to mechanical engineering analysis through the study of numerical methods and matrix algebra and the use of modern numerical computing tools for problem solving.

ME 2330. Dynamics.  
Lec. 3. Credit 3.  
Prerequisite: CEE 2110 and PHYS 2110. Particle Kinematics; relative motion; kinetics, applications of Newton's Laws, work-energy principle, impulse-momentum principle, vibrations.

ME 3001. Mechanical Engineering Analysis.  
Lec. 3. Credit 3.  
Prerequisite: ENGR 1120, MATH 2120, and MATH 2110. Analytical and numerical techniques are developed for problems arising in mechanical engineering. Analytical methods include applications of Laplace transforms, Fourier series and separation of variables. Numerical methods include root finding, quadrature rules, and solutions to ordinary and partial differential equations. Use of modern numerical computing tools for problem solving.

ME 3010. Materials and Processes in Manufacturing.  
Lec. 3. Credit 3.  
Prerequisite: CEE 3110, CHEM 1020 or CHEM 1120. Property/microstructure interrelations and design considerations for engineering materials; overview of manufacturing processes; interrelations among materials, design and manufacturing; and introduction to failure criteria and material selection. CEE 3110 may be taken concurrently.

ME 3023. Measurements in Mechanical Systems.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: CEE 3110, ECE 3810 and ECE 3860. Principles of measurement and calibration; basic instrumentation and measurement techniques in mechanical systems. CEE 3110 may be taken concurrently.

ME 3050. Dynamic Modeling and Controls.  
Lec. 3. Credit 3.  
Prerequisite: MATH 2120, ME 3023, and ME 2330. Corequisite: ME 3060. Dynamic Modeling and Controls Laboratory (1 hr Lab). Modeling and simulation of lumped parameter mechanical, electrical, thermal, fluid, and mixed systems, control algorithms, stability, transient response and frequency response.

ME 3060. Dynamic Modeling and Controls Laboratory.  
Lab. 2. Credit 1.  
Corequisite: ME 3050. Experiments and simulations of lumped parameter mechanical, electrical, thermal, fluid, and mixed
systems, control algorithms, stability, transient response, and frequency response.

**ME 3110. Physical Metallurgy and Heat Treatment.**
Lec. 3. Credit 3.
Prerequisite: Junior standing. Structure and properties of ferrous and nonferrous metals and alloys; equilibrium diagrams; heat treatment methods and effects; and behavior in service. Not for ME majors.

**ME 3210. Thermodynamics I.**
Lec. 3. Credit 3.
Prerequisite: CHEM 1110 and MATH 2110. Concepts, models and laws; energy and the first law; properties and state; energy analysis of thermodynamics systems; entropy and the second law; and conventional power and refrigeration cycles.

**ME 3220. Thermodynamics II.**
Lec. 3. Credit 3.
Prerequisite: ME 3210. Gas power and refrigeration cycles, equations of state and general thermodynamic relations, ideal gas mixtures, properties of gaseous mixtures, combustion and chemical equilibrium.

**ME 3610. Dynamics of Machinery.**
Lec. 3. Credit 3.
Prerequisite: ME 2330. Motion converters and design process. Mobility equations; solutions of vector equations; kinematic position, velocity and acceleration analysis of mechanisms; introductory geometric synthesis of linkages; design of cam-follower mechanisms; gear tooth geometry; analysis and synthesis of gear trains and planetary gear differentials; and computer-aided studies.

**ME 3710. Heat Transfer.**
Lec. 3. Credit 3.
Prerequisite: MATH 2120 and ME 3210. Single and multidimensional steady-state and transient heat conduction; role of convection for internal and external forced flows and in buoyancy-driven flow; and thermal radiation processes and properties. ME 3210 may be taken concurrently.

**ME 3720. Fluid Mechanics.**
Lec. 3. Credit 3.
Prerequisite: ME 2330. Fundamentals of fluid flow; fluid statics; systems and control volumes; continuity, momentum and energy equations; dynamic similarity; one-dimensional open channel flow; and compressible flow.

**ME 3900. Professionalism and Design.**
Lec. 2. Lab. 2. Credit 3.
Prerequisite: ENGR 1110, MATH 1920. Introduction to engineering design with emphasis on the design process, economics and professionalism.

**ME 3910. Mechanical Engineering Seminar.**
Lec. 2. Credit 1.
Second term junior standing. Professional, social, and ethical issues in engineering practice; oral and written technical communication.

**ME 4010. Machine Design.**
Lec. 3. Credit 3.
Prerequisite: CEE 3110, ME 3010 and ME 3610. Tools of machine design; stress strain and deformation of machine parts; inherent properties of machine parts; design of machine parts for strength; design of machine parts for rigidity; and introduction to finite element analysis. ME 3810 may be taken concurrently.
Lec. 3. Credit 3.  
Prerequisite: ME 3220, ME 3710, or equivalent. Energy conversion and conservation techniques used in industrial applications; energy audits, heat loss considerations, and energy measurements.

ME 4310 (5310). Gas Dynamics.  
Lec. 3. Credit 3.  
Prerequisite: ME 3220 and ME 3720. Fundamental motions, shock waves, flow through ducts and nozzles, unsteady wave motion, linearized flows, and method of characteristics.

ME 4370 (5370). Mechatronics and Intelligent Machines Engineering.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: ECE 3810, and ECE 3860; ME 3050 and ME 3060. Mechatronics; number systems; microcontroller technology and architecture of 8-bit microcontrollers (e.g. Motorola MC68H110), assembly language programming, A/D and D/A conversion, parallel I/O; programmable timer operation, interfacing sensors and actuators, applications, and team project on design and implementation of a mechatronic system.

Lec. 3. Credit 3.  
Prerequisite: Senior of graduate level standing in any College of Engineering Department. Nano manufacturing, silicon Micro machining and fabrication, laser materials processing of microstructures, abrasive micro machining, mechanical micro machining, micro rapid prototyping and sintering, and case studies.

ME 4444. Senior Design Project.  
Lec. 2. Lab. 4. Credit 4.  
Prerequisite: ME 3050, ME 3060, ME 3910; ME 4751; and ME 4020 as a prerequisite with ME 4720 as a corequisite, or ME 4720 as a prerequisite with ME 4020 as a corequisite. Capstone group design project in mechanical engineering with FE exam review.

ME 4450 (5450). Design for Manufacturability.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: ME 3010 and CEE 3110. Material and manufacturing process constraints on design shape, size and quantity; plastic and fibrous composite parts manufacturing; rapid prototyping; design for X; dimensions and tolerances.

Lec. 3. Credit 3.  
Prerequisite: CEE 3110, ME 3010, or consent of instructor. Elastic and anelastic properties, edge and screw dislocations, slip planes, plastic deformation, and properties of ceramics and polymers.

Lec. 2. Lab. 2. Credit 3.  
Prerequisite: CHEM 1120, MATH 2120, and PHYS 2110. Selected materials synthesis for metals, ceramics and their composites, application of fracture mechanics and failure models, mechanical, chemical, and morphological characterization theory and practice, and materials design.
ME 4751. Energy Systems Laboratory.  
Lec. 1. Lab. 2. Credit 2.  
Prerequisite: ME 3023, ME 3710, and ME 3720. Basic instrumentation and principles of measuring pressure, temperature, fluid velocity, and fluid flow rate; demonstrations, measurements, and evaluations of heat transfer and fluid flow processes.

ME 4810 (5810). Automatic Controls.  
Lec. 3. Credit 3.  
Prerequisite: ME 3050. Mathematical modeling of physical systems, control algorithms, stability, transient response, and frequency response. ME 3050 may be taken concurrently.

ME (CEE) 4930 (5930). Noise Control.  
Lec. 2. Lab. 2. Credit 3.  
Prerequisite: MATH 2120 and PHYS 2110. Identification and description of noise sources and noise radiation, methods of noise measurement and criteria for noise levels, principles, and techniques of noise control.

Lec. 3. Credit 3.  
Prerequisite: Senior standing in engineering or consent of instructor. Introduce the design, fabrication and performance of MEMS devices. Topics include bulk and surface micromachining, photolithography, sensors, actuation systems, optical MEMS, and microcantilever based systems.

ME 4990. Special Problems.  
Credit 1 to 9 per semester. Maximum 24.  
Prerequisite: Approval of department chairman. Investigation of current topics in the student's area of interest. Because of the impossibility of duplicating the conditions for a special topic, this course may not be repeated for the improvement of a grade.

Military Science (MS)

BASIC

MS 1000. Basic Physical Conditioning.  
Lab. 3. Credit 1.  
Physical Fitness Program to develop stamina, flexibility, coordination, speed, upper body strength and to enhance lifestyle.

MS 1001. Basic Physical Conditioning.  
Lab. 3. Credit 1.  
Physical Fitness Program to develop stamina, flexibility, coordination, speed, and upper body strength and to enhance lifestyle.

MS 1010. Fundamental Concepts.  
Lec. 1. Lab. 1. Credit 2.  
Fundamental components of service as an officer. Addresses "life skills," including fitness, communications theory, and interpersonal relationships.

MS 1020. Basic Leadership.  
Lec. 1. Lab. 2. Credit 2.  
Builds upon previous semester and introduces problem-solving, critical thinking, leadership theory, followership, group interaction, goal setting, and feedback mechanisms.

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MS 2000. Basic Physical Conditioning.  
Lab. 3. Credit 1.  
Army PT Program to develop stamina, flexibility, coordination, speed, upper body strength, self-discipline, and health, and to enhance lifestyle.

Lab. 3. Credit 1.  
Army PT Program to develop stamina, flexibility, coordination, speed, upper body strength, self-discipline, and health, and to enhance lifestyle.

MS 2010. Advanced Leadership.  
Lec. 2. Lab. 2. Credit 2.  
Prerequisite: MS 1010 and MS 1020 or permission of Professor of Military Science. Principal leadership instruction of the Basic Course. Building on the fundamentals introduced in the MS I year, this class delves into several aspects of communication and leadership theory.

MS 2020. Tactics and Officership.  
Lec. 2. Lab. 2. Credit 2.  
Prerequisite: MS 1010, MS 1020, and MS 2010 or permission of Professor of Military Science. An extensive examination of the unique purposes, roles and obligations of commissioned officers. Includes a detailed look at the origin and practical application of the Army's institutional values.

MS 2900. Leader's Training Course.  
Credit 8.  
Prerequisite: Permission of the Professor of Military Science. Five week training during the summer. Conducted at an Army post; leadership, small unit tactics, weapons, drill and a writing assignment due two weeks after the five weeks of training.

ADVANCED

MS 3000. Advanced Physical Conditioning.  
Lab. 3. Credit 1.  
Army Physical Fitness Program to develop stamina, flexibility, coordination, speed, upper body strength, self-discipline, and health and to enhance lifestyle.

MS 3001. Advanced Physical Conditioning.  
Lab. 3. Credit 1.  
Army Physical Fitness Program to develop stamina, flexibility, coordination, speed, upper body strength, self-discipline, and health and to enhance lifestyle.

MS 3010. Small Unit Leadership.  
Lec. 3. Lab. 2. Credit 3.  
Leadership and development through study and practical application of principles of social sciences and management and military tactics.

MS 3020. Small Unit Operations.  
Lec. 3. Lab. 2. Credit 3.  
Practical application of leadership skills. Techniques for planning, organizing, and decision-making in military operations.

MS 3040. Leader Development Assessment Course.-- Summer.  
Credit 3.  
Prerequisite: MS 3010 and MS 3020. Five weeks training conducted at an Army Post evaluating practical application of
classroom skills and developing leadership potential.

**MS 3222. Introduction to Officer Professional Development.**  Lec. 3. Credit 3. The course is designed to foster and instill necessary life-long learning necessary from the Military professional.

**MS 4000. Advanced Physical Conditioning.**  Lab. 3. Credit 1. Application of planning/conducting Army Physical Fitness Program.

**MS 4001. Advanced Physical Conditioning.**  Lab. 3. Credit 1. Application of planning/conducting Army Physical Fitness Program.

**MS 4002. Advanced Physical Conditioning.**  Lab. 3. Credit 1. Prerequisite: Consent of instructor. Army Physical Fitness Program.

**MS 4003. Advanced Physical Conditioning.**  Lab. 3. Credit 1. Prerequisite: Consent of instructor. Army Physical Fitness Program.

**MS 4010. Leadership, Management & Ethics.**  Lec. 3. Lab. 2. Credit 3. Techniques of military leadership, communications, ethics, and decision-making process. Includes research and writing requirements.

**MS 4020. Transition to Lieutenant.**  Lec. 3. Lab. 2. Credit 3. Advanced techniques in leadership, planning and decision making. Includes research, writing requirements, and battlefield study trip.

**Music (MUS)**

**Organizations**

**MUS 1001. Horn Choir.**  Lab. 2. Credit 0-1. Preparation of chamber music scores for instruments of the horn family.

**MUS 1002. Trombone Choir.**  Lab. 2. Credit 0-1. Preparation of chamber music scores for instruments of the trombone family.

**MUS 1003. Flute Choir.**  Lab. 2. Credit 0-1. Preparation of chamber music scores for instruments of the flute family.

**MUS 1004. Clarinet Choir.**  Lab. 2. Credit 0-1. Preparation for concert performance of chamber music scores for instruments of the clarinet family.

**MUS 1005. Chamber Music.**  Lab. 2. Credit 0-1. Preparation for concert performance of vocal and instrumental chamber music scores.

**MUS 1007. Tuba Ensemble.**  Lab. 3. Credit 0-1. Preparation for concert performance of chamber music scores for instruments of tuba family.

**MUS 1009. Trumpet Choir.**  Lab. 2. Credit 0-1. Preparation for concert performance of chamber music scores for instruments of the trumpet family.


**MUS 1015. Percussion Ensemble.**  Lab. 2. Credit 0-1. Preparation for concert performance of music written or transcribed for percussion ensemble.

**MUS 1016. Accompanying.**  Lab. 2. Credit 1. Instruction and performance in accompanying for piano majors.

**MUS 1017. Bassoon Choir.**  Lab. 2. Credit 0-1. Preparation of chamber music scores for instruments of the bassoon family.

**MUS 1018. Saxophone Choir.**  Lab. 2. Credit 0-1. Preparation of chamber music scores for instruments of the saxophone family.

**MUS 1025. Wind Ensemble.**  Lab. 2. Credit 0-1. Prerequisite: Successful audition. A select ensemble of wind and percussion instrumentalists.


**MUS 1033. Marching Band.**--Fall.  Lab. 4. Credit 0-1. Preparation and performance for all home football games and other campus and community events.

**MUS 1040. Symphony Band.**  Lab. 5. Credit 0.1. Prerequisite: Successful audition. A wind band comprised of 60-80 instrumentalists.

**MUS 1045. Concert Band.**  Lab. 4. Credit 0-1. Prerequisite: Successful audition. A wind and percussion band; open to all students.

**MUS 1050. Women's Chorus.**  Lab. 2. Credit 0-1. Prerequisite: Successful audition. A choral performance ensemble for female voices, open to all University students.

**MUS 1054. Men's Chorus.**  Lab. 2. Credit 0-1. Prerequisite: Successful audition. A choral performance ensemble for male voices, open to all University students.

**MUS 1060. Chorale.**  Lab. 5. Credit 0-1. Prerequisite: Successful audition. A select choral ensemble.

**MUS 1062. Madrigal Singers.**  Lab. 2. Credit 0-1. Prerequisite: Successful audition. A select chamber ensemble open, by audition, to all university students. The ensemble will consist of 16 to 20 singers who will primarily perform music
from the Renaissance period and will perform one "Madrigal Feaste" per school year.

MUS 1065. Mastersingers. Lab. 2. Credit 0-1. A choral ensemble open to students and members of the community for the purpose of performing major choral works.

MUS 1070. Concert Choir. Lab. 3. Credit 0-1. A large choral ensemble open to all university students.

MUS 1076. Beginning West African Drumming. Lec. 2. Credit 1. Prerequisite: Consent of instructor. The performance of drum rhythms and songs from Ghana and surrounding countries.


MUS 1078. Beginning West African Dance. (also listed as PHED 1250) Lab. 2. Credit 1. Performance of dances and songs from Ghana and surrounding countries.

MUS 1079. Advanced West African Dance. (also listed as PHED 1260) Lab. 2. Credit 1. Prerequisite: MUS 1078. A continuation of the performances of dances and songs from Ghana and surrounding countries.

MUS 1080. Bryan Symphony Orchestra. Lab. 2. Credit 0-1. Prerequisite: Successful audition. A symphony orchestra including students, faculty and regional musicians.

MUS 1085. University Orchestra. Lab. 3. Credit 0-1. An orchestra open to all university students, exploring repertoire for chamber and full symphony orchestra.

MUS 1090. Jazz Ensemble. Lab. 3. Credit 0-1. Prerequisite: Successful audition. Organized instrumental groups rehearsing and performing music in the jazz and "Pop" idiom.

MUS 1091. Jazz Lab Band. Lab. 3. Credit 0-1. An instrumental experience in the jazz/pop idiom; open to all students.

MUS 3006. Opera Workshop. Lab. 2. Credit 0-1. Prerequisite: Successful audition. Techniques of auditioning, staging, rehearsal and production of musical comedy and opera.

Class Instruction

MUS 1011. Beginning Class Piano for Music Majors I. Lec. and Lab. 2. Credit 1. Designed to give a functional knowledge of the piano.

MUS 1012. Beginning Class Piano for Music Majors II. Lec. and Lab. 2. Credit 1. Designed to give a functional knowledge of the piano.

MUS 1021. Class Voice Instruction I. Lec. and Lab. 2. Credit 1. Rudiments of posture, breathing and song interpretation, tone production, and stage deportment.

MUS 1022. Class Voice Instruction II. Lec. and Lab. 2. Credit 1. Rudiments of posture, breathing and song interpretation, tone production, and stage deportment.

MUS 1023. Intermediate Class Piano for Music Majors III. Lec. and Lab. 2. Credit 1. Prerequisite: MUS 1012 or previous piano experience. Designed to prepare music students with previous keyboard experience for the piano proficiency examination.

MUS 1024. Intermediate Class Piano for Music Majors IV. Lec. and Lab. 2. Credit 1. Prerequisite: MUS 1023 or previous piano experience. Designed to prepare music students with previous keyboard experience for the piano proficiency examination.

MUS 1027. Keyboard Skills for Music Therapy I. Lab. 2. Credit 1. Prerequisite: Music Therapy major; passed ALL portions of piano proficiency. Keyboard skills and repertoire necessary for the practice of music therapy, including: accompaniment, harmonization, improvisation, performance of selected repertoire.

MUS 1028. Keyboard Skills for Music Therapy II. Lab. 2. Credit 1. Prerequisite: Music Therapy major; passed ALL portions of piano proficiency; MUS 1027 or consent of instructor. Keyboard skills and repertoire necessary for the practice of music therapy, including: accompaniment, harmonization, improvisation, performance of selected repertoire. Continuation of MUS 1027.

MUS 1029. Oratorio Class. Lab. 2. Credit 1. A survey of the major representative oratorio literature, which features sections and arias for the solo voice and ensembles. Periods of study will include the Baroque to the Twentieth Century.

MUS 1031. Stringed Instrument Class I. Lec. and Lab. 2. Credit 1. Each student studies the four instruments of the string section: violin, viola, violincello, and bass viol.

MUS 1032. Stringed Instrument Class II. Lec. and Lab. 2. Credit 1. Each student studies the four instruments of the string section: violin, viola, violincello and bass viol.

MUS 1036. Intermediate Class Guitar. Lab. 2. Credit 1. Prerequisite: MUS 1035 or consent of instructor. Additional skills and techniques for students already possessing a basic command of the instrument.

MUS 1041. Woodwind Instrument Class I. Lec. and Lab. 2. Credit 1. Each student will learn basic performance skills on two instruments each semester.

MUS 1051. Brass Instrument Class I. Lec. and Lab. 2. Credit 1. Each student will learn basic performance skills on two instruments each semester.

MUS 1071. Percussion Instrument Class I. Lec. and Lab. 2. Credit 1. Each student will learn basic performing skills on a snare drum and mallet instruments as well as study other percussion family instruments.

MUS 1072. Percussion Instrument Class II. Lec. and Lab. 2. Credit 1. Each student will develop performance skills on a wide range of percussion instruments through laboratory ensemble experiences.

MUS 1081. Improvisation I. Lab. 2. Credit 1. Prerequisite: MUS 1140 and MUS 1150 with a grade of C or better. Development of improvisation skills in varied musical styles. Emphasis on performance and aural perception.

MUS 1082. Improvisation II. Lab. 2. Credit 1. Prerequisite: MUS 1081 with a grade of C or better. Development of improvisation skills in varied musical styles. Emphasis on performance and aural perception.

MUS 1195. Student Recital. Credit 1. Prerequisite: Consent of studio instructor. Corequisite: Enrollment in private instruction in pertinent studio. Open to any non-curricular solo recital performance. May be repeated for credit. Recital fee applies.

MUS 1210. Diction for Singers I. Lab. 2. Credit 1. Language diction for singers, including Latin and Italian, stressing similarities and differences of sung language.

MUS 1220. Diction for Singers II. Lab. 2. Credit 1. Prerequisite: MUS 1210. Language diction for singers, including English, German and French, stressing similarities and differences of sung language.

MUS 3530. Music Applications. Lec. 3. Credit 3. Prerequisite: Admission to the Teacher Education Program. Course content is directed toward the music education needs of prospective elementary classroom teachers.

Private Instruction (Lower Division)

The following courses can be repeated for multiple credit.

MUS 1000. Private Composition. Credit 1-2.
MUS 1500. Private Trumpet. Credit 1-2.

Private Instruction (Upper Division)

The completion of four semesters in the Lower Division is required for enrollment in the Upper Division. In addition, each applicant must be approved by the jury hearing his/her performance examination at the end of the fourth semester, and also by his/her private instructor before being allowed to register for study at the 3000-level. The following courses can be repeated for multiple credit except for MUS 3950 and MUS 4000.

MUS 3000. Private Composition. Credit 1-2.
Music Theory

A basic course for general students, including the study of music construction, notation, literature and techniques for listening.

MUS 1120. Harmony I. Lec. 3. Credit 3.
Prerequisite: Passing score on Entrance Exam. Corequisite: MUS 1130. Scales, intervals, triads, rhythms, chord functions, part-writing, inversions, cadences, non-harmonic tones, and musical analysis.

MUS 1130. Aural Techniques I. Lab. 2. Credit 1.

MUS 1140. Harmony II. Lec. 3. Credit 3.
Prerequisite: MUS 1120 with a grade of C or better.
Corequisite: MUS 1150. Modulation to closely related keys, borrowed chords, neapolitans, irregular chord resolution, original composition, and musical analysis.

MUS 1150. Aural Techniques II. Lab. 2. Credit 1.
Prerequisite: MUS 1130 with a grade of C or better.
Corequisite: MUS 1140. Aural perception, singing, and keyboard performance of materials in MUS 1140.

MUS 2110. Harmony III. Lec. 1. Lab. 2. Credit 2.
Prerequisite: MUS 1140 with a grade of C or better.
Corequisite: MUS 2120. Chromaticism, altered chords, secondary functions, augmented sixth chords, and musical analysis.

MUS 2120. Aural Techniques III. Lab. 2. Credit 1.
Prerequisite: MUS 1150. Corequisite: MUS 2110. Aural perception, singing, and keyboard performance of materials in MUS 2110.

Prerequisite: MUS 2110 with a grade of C or better.

MUS 2140. Aural Techniques IV. Lab. 2. Credit 1.
Prerequisite: MUS 2120 with a grade of C or better.
Corequisite: MUS 2130. Aural perception, singing, and keyboard performance of materials in MUS 2130.

MUS 3130. Form and Analysis. Lec. 2. Credit 2.
Prerequisite: MUS 1024, MUS 2130 with a grade of C or better and Harmony/AT Exam. A comprehensive study of the structure of music from all historic periods.

MUS 3140. Counterpoint. Lec. 3. Credit 3.
Prerequisite: MUS 3130 with a grade of C or better. The study of 18th century/counterpoint: analysis, composition. The relationship between Baroque and 20th century contrapuntal techniques.

Prerequisite: MUS 1024, MUS 2130, MUS 2140, MUS 4510, MUED 3620 with a grade of C or better and Harmony/AT Exam. Ranges, timbre mixtures, and transpositions for all music media, as related to standard scoring techniques. Ensemble scores are constructed.

MUS 3220. Jazz Composition and Arranging I. Lec. 2. Credit 2.
Prerequisite: MUS 1024, MUS 2130, MUS 2140 with a grade of C or better and Harmony/AT Exam. Original compositions and arrangements in jazz styles for large and small ensembles. Student work will be performed and recorded.

MUS 3230. Jazz Composition and Arranging II. Lec. 2. Credit 2.
Prerequisite: MUS 3220 with a grade of C or better. Original compositions and arrangements in jazz styles for large and small ensembles. Student work will be performed and recorded.

Prerequisite: MUS 1024, MUS 2130, MUS 2140 with a grade of C or better and Harmony/AT Exam. The study of the diverse types of vocal combinations with attention to age groups, ensemble size and styles. Particular attention to text setting and the voice with various instrumental possibilities.

Activities designed to offer supervised, practical experience in private studio teaching: planning and presenting lessons, and directing individual study.

MUS 4720 (5720). Supervised Teaching Experience II. Ind. Credit 2.
Continuation of MUS 4710 (5710).

◆ Meets Tennessee Technological University and Tennessee
Tennessee Technological University

Board of Regents minimum degree requirements.

Music History and Literature

◆ MUS 1030. Music Appreciation. Lec. 3. Credit 3. Survey of various styles and forms of music with recordings used for class listening.


MUS 3010. Music History and Literature I. Lec. 3. Credit 3. Prerequisite: MUS 1030, MUS 1140, and MUS 1150 with a grade of C or better. Western music of the Ancient, Medieval, Renaissance, Baroque and Classical periods. Materials basic to research on musical topics.

MUS 3020. Music History and Literature II. Lec. 3. Credit 3. Prerequisite: MUS 1030, MUS 1140, and MUS 1150 with a grade of C or better. Western music of the Romantic period and 20th century. Expansion of research experience on a variety of musical topics.

MUS 3710. Pedagogy and Literature I. Lec. 2. Credit 2. Techniques, materials, and methodologies used in the application of learning theory to studio instruction.


MUS 3800. Vocal Pedagogy and Literature I. Lec. 2. Credit 2. A study in methodologies, principles, and procedures developed for systematized learning in the art of singing. Directed information for the singer, studio teacher, and choral director. Vocal acoustics, breathing, and laryngeal functions are studied.

MUS 3810. Vocal Pedagogy and Literature II. Lec. 2. Credit 2. Prerequisite: MUS 3800 with a grade of C or better. Teaching strategies and philosophies, diagnosis of vocal faults, stage deportment, vocal repertoire, and ethics for teachers are studied. Supervised lab experience in teaching by participating students.

MUS 4110 (5110). History and Literature of Jazz. Lec. 2. Credit 2. Jazz traced from its multi-ethnic origin through to its present form and its influences on American culture.

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MUS 4120 (5120). Contemporary Music. Lec. 2. Credit 2. Prerequisite: MUS 3010 or MUS 3020 and MUS 2110. MUS 2120 with a grade of C or better. The culture of musical pluralism since World War II, including art music, jazz, rock, and folk.

Music Technology

MUS 4250. Recording Techniques. Lec. 2. Lab. Arr. Credit 2. Prerequisite: MUS 1024, MUS 2130, MUS 2140 with a grade of C or better. An introduction to sound recording, including analog and digital formats. Emphasis on applications appropriate to performing musicians.

MUS 4510. Computer Applications in Music. Lec. 1. Lab. 2. Credit 2. Prerequisite: MUS 1120 and MUS 1130 with a grade of C or better. An introduction to computer applications in music performance, composition, teaching, and related fields.

Music Education (MUED)

MUED 1820. Introduction to Music Education. Lab. 3. Credit 1. Prerequisite: MUS 1140 and MUS 1150. Introduction to the music education profession with emphasis on observing a variety of K.12 public school teaching/conducting settings. Music Education majors only.

MUED 3110. Materials and Methods in Music, Grades K-5. Lec. 3. Lab. 1. Credit 3. Prerequisite: Admission to Teacher Education Program and MUS 1024. This course will explore materials, methods and techniques used in teaching general music to children in grades Kindergarten through five. Public school field experience required.

MUED 3130. Materials and Methods in Instrumental Music, Grades 6-12. Lec. 3. Lab. 1. Credit 3. Prerequisite: Admission to Teacher Education Program and MUS 1024. Intended for the instrumental music education major, this course will explore a variety of materials, methods and techniques which can be used to build and maintain successful school band and orchestra programs. Public school field experience required.

MUED 3140. Materials and Methods in Vocal Music, Grades 6-12. Lec. 3. Lab. 1. Credit 3. Prerequisite: Admission to Teacher Education Program and MUS 1024. Intended for the vocal/general music education major, this course is directed towards developing a working knowledge of teaching strategies necessary for successful choral/general music programs. Public school field experience required.

MUED 3230. Marching Band Techniques. --Fall. Lec. 2. Lab. Arr. Credit 2. Prerequisite: MUS 1024, MUS 2130, MUS 2140, and Harmony/AT Exam; MUS 1820 with a grade of B; and pass
Praxis I exam. Group and individual drill maneuvers; music selection and arranging; and designing and charting for effective outdoor performances.

**MUED 3620. Fundamentals of Conducting.**  
Lec. 1. Credit 1.  
Prerequisite: MUS 1024, MUS 2130, MUS 2140, and Harmony/AT Exam; MUED 1820 with a grade of B. Technique, practice and principles of conducting. Development of effective hand and baton techniques.

**MUED 3630. Instrumental Conducting and Literature.**  
Lec. 1. Lab. 2. Credit 2.  
Prerequisite: MUED 3620. Technique, practice, and principles of instrumental conducting in performance through a study of the standard repertoire.

**MUED 3640. Choral Conducting and Literature.**  
Lec. 1. Lab. 2. Credit 2.  
Prerequisite: MUED 3620. Technique, practice and principles of choral conducting in performance through a study of the standard repertoire.

**MUED 3735. String Pedagogy and Literature I.**  
Lec. 1. Lab. 2. Credit 2.  
Techniques and methods used in developing a public school string education program.

**MUED 3740. String Pedagogy and Literature II.**  
Survey of string literature from the 17th Century to the present, which is appropriate to the development of the public school string program.

**MUED 3810. Practicum in Music Education I.**  
Credit 1.  
Corequisite: MUS 1024, MUS 2130, MUS 2140, and Harmony/AT Exam; MUED 1820 with a grade of B; and pass Praxis I exam. Supervised work experiences in the public schools stressing the translation of theory into practice.

**MUED 3830. Practicum in Music Education II, Instrumental.**  
Credit 1.  
Prerequisite: MUS 1024, MUS 2130, MUS 2140, and Harmony/AT Exam; MUED 1820 with a grade of B; and pass Praxis I exam; and MUED 3620. Corequisite: MUED 3130. Instrumental music education majors will have the opportunity to translate theory into practice through guided work experiences in the public schools.

**MUED 3840. Practicum in Music Education II, Vocal.**  
Credit 1.  
Prerequisite: MUS 1024, MUS 2130, MUS 2140, Harmony/AT Exam; MUED 1820 with a grade of "B"; pass Praxis I exam; MUED 3620. Corequisite: MUED 3140. Intended for the vocal/general music education major, this course provides the student with practical teaching experience in secondary choral/general music classes.

**MUED 4510-4520. Special Problems.**  
Lab. 4. Credit 1-2.  
Prerequisite: Consent of appropriate area coordinator. Work in a field approved by the coordinator.
MUST 2110. Introduction to Music Therapy.  
Lec. 3. Credit 3.  
Overview of the field of music therapy; therapeutic applications of music. Professional aspects of the discipline.

Lec. and Lab. 2. Credit 1.  
Prerequisite: MUST major; MUST 1220 or consent of instructor. Teaching and modeling techniques; therapy techniques: relaxation with music, songwriting, musical improvisation, song arranging for ensembles, song repertoire development.

MUST 2310. Clinical Orientation.  
Lec. 2. Credit 2.  
Prerequisite: MUST major; MUST 2110 with a grade of "C" or better. The music therapy treatment process and related clinical skills.

MUST 3220. Advanced Techniques of Music Therapy.  
Lec. and Lab. 2. Credit 1.  
Prerequisite: MUST major; MUST 1220, MUST 2220 or consent of instructor. Advanced group leadership techniques and music therapy procedures, including: lyric discussion, client songwriting, advanced improvisation. Group process; music therapy with various treatment models.

MUST 3520. Psychology of Music.  
Lec. 3. Credit 3.  
Human musical behavior, auditory perception, emotional response to music; reading and evaluating research literature in psychology of music.

MUST 3530. Music Therapy Research.  
Lab. 2. Credit 1.  
Prerequisite: MUST major with grade of "C" or better in MUST 3520; admission to Professional Level. Research designs and models; assigned project in music therapy/music psychology research.

MUST 4110. Special Topics in Music Therapy.  
Lab. 4. Credit 2.  
Prerequisite: Consent of Director of Music Therapy. Individualized study in an area of music therapy research or clinical practice approved by the instructor.

MUST 4220. Music Therapy Theory and Practice I.  
Lec. 3. Credit 3.  
Prerequisite: MUST major; admission to Professional Level. Theory and applications of music therapy with identified conditions and disabilities. Study of professional issues.

MUST 4230. Music Therapy Theory and Practice II.  
Lec. 3. Credit 3.  
Prerequisite: MUST major; admission to Professional Level. Theory and applications of music therapy with identified conditions and disabilities. (Continuation of MUST 4220).

MUST 4510. Practicum in Music Therapy.  
Credit 5.  
Prerequisite: MUST major; consent of Director of Music Therapy. Supervised clinical field work in music therapy. Setting, clients and skill-development levels to be designated in consultation with instructor.

MUST 4610. Internship in Music Therapy.  
Prerequisite: MUST major; completion of all required on-campus course work. A six-month (1040 hours) internship at an AMTA-approved training site.

Nursing (NURS)

NURS 1020. First-Year Connection: University and Nursing.  
Credit 1.  
Prerequisite: First-time college student, minimum ACT 20 and high school GPA 3.00. A course designed to enhance connection of the first-time college student with the University and to nursing. This course is designed to augment skills required for academic success through academic and non-academic out-of-classroom activities.

NURS 2300. Introduction to Professional Nursing Concepts I.  
Lec. 2. Credit 2.  
Historical perspectives, mathematics, and terminology basic to nursing; critical thinking and professional communication; and roles of the professional nurse.

NURS 3220. Fundamentals of Nursing.  
Lec. 2. Lab 1. Credit 3.  
This introductory course in nursing is designed to introduce the student to basic concepts, principles, and skills necessary for building effective nursing practice. Nursing process is introduced as a foundation for future clinical application.

NURS 3230. Pharmacological Concepts in Nursing I.  
Lec. 2. Credit 2.  
Introduction to major drug classifications, including actions, interactions, reactions, and contraindications as well as monitoring parameters. This course will prepare the nurse to safely administer medications, monitor drug therapy, and teach the client to safely take part in his/her drug regimen.

NURS 3250. Medical Surgical Nursing I.  
Lec. 4. Credit 4.  

NURS 3280. Medical Surgical Nursing I: Lab.  
Lab. 9. Credit 3.  
Corequisite: NURS 3250. Performance of nursing skills in lab and clinical settings based on principles of nursing process and practice.

NURS 3281. Health Assessment and Promotion.  
Lec. 2. Lab. 1. Credit 3.  
This course is an introduction to health assessment based on an understanding of anatomy and physiology and social sciences. The focus is on comprehensive data collection through history and physical examination.

NURS 3360. Medical Surgical Nursing II.  
Lec. 5. Credit 5.  
Corequisite: NURS 3361. Medical-surgical nursing concepts; also including communication skills, teaching/learning principles, ethical/legal, and economic issues.
Tennessee Technological University

NURS 3361. Medical Surgical Nursing II: Lab.  
Lec. 3. Lab. 9. Credit 3.  
Corequisite: NURS 3360. Emphasizes the application of the nursing process in a variety of medical-surgical clinical settings.

NURS 3370. Mental Health Nursing.  
Corequisite: NURS 3371. Basic mental health nursing concepts; also including communication skills, teaching/learning principles, ethical/legal, and economic issues.  
Lec. 3. Credit 3.

NURS 3371. Mental Health Nursing: Lab.  
Corequisite: NURS 3370. Emphasizes the application of the nursing process in a variety of mental health clinical settings.  
Lab. 6. Credit 2.

NURS 3380. Pathophysiological Processes for the Professional Nurse.  
Lec. 3. Credit 3.  
This course will examine the outcomes of disruption of normal physiology; the alterations and mechanisms involved in the disruption; and the manifestations in disease and at risk conditions. Major diseases will be explored, in part by using a conceptual approach. The focus of the course is to provide the professional nurse with an understanding of pathophysiological principles as the basis for nursing assessment and therapeutic intervention.

NURS 3430. Survey of Pharmacological Aspects of Nursing.  
Lec. 3. Credit 3.  
Prerequisite: NURN standing or permission of the instructor. Review and update of major drug groups, and administering drugs, and intravenous solutions with implications for nursing practice.

NURS 3465. Bridging to Professional Nursing Practice.  
Credit 4.  
An online course designed for RN’s to bridge the gap between technical skills and professional nursing practice by focusing on self analysis and validation of one’s own ability to utilize critical thinking, communication, and therapeutic intervention in nursing practice and to identify improvement areas for life long learning in a changing healthcare environment.

NURS 4000. Women’s Health and Perinatal Nursing.  
Lec. 3. Credit 3.  
Corequisite: NURS 4001. This course focuses on concepts of professional nursing care of women in their childbearing years and their families. This course encompasses knowledge of growth and development, culture, family, and pathophysiology from the natural and social sciences, and liberal arts in assessing, implementing, and evaluating the health needs of these populations.

NURS 4001. Women’s Health and Perinatal Nursing: Lab.  
Lab. 6. Credit 2.  
Corequisite: NURS 4000. This course focuses on implementation of the nursing process with women in their childbearing years and their families. This course applies knowledge of growth and development, culture, family, and pathophysiology from the natural and social sciences, and liberal arts in assessing, implementing and evaluating the health needs of these populations.

NURS 4100. Nursing Care of Children.  
Lec. 3. Credit 3.  
Corequisite: NURS 4101. This course focuses on concepts of professional nursing care of children and their families. This course encompasses knowledge of growth and development, culture, family, and pathophysiology from the natural and social sciences, and liberal arts in assessing, implementing and evaluating the health needs of these populations.

NURS 4101. Nursing Care of Children: Lab.  
Lab. 6. Credit 2.  
Corequisite: NURS 4100. This course focuses on implementation of the nursing process with children and their families. This course applies knowledge of growth and development, culture, family and pathophysiology from the natural and social sciences and liberal arts in assessing, implementing, and evaluating the health needs of these populations.

NURS 4230. Pharmacological Concepts in Nursing II.  
Lec. 2. Credit 2.  
Continued study of the major drug groups with emphasis on the responsibility of the nurse in medication administration, patient education, and health promotion.

NURS 4300. Research in Health Care.  
Lec. 3. Credit 3.  
Study the research process with development and presentation of a completed research proposal.

NURS 4350. Health Care of Communities.  
Lec. 4. Credit 4.  
Corequisite: NURS 4351 Focus on the dynamics and nursing needs of individuals, families, communities, national, and international groups.

NURS 4351. Health of Communities: Lab.  
Lab. 9. Credit 3.  
Corequisite: NURS 4350. Organization and delivery of nursing care to individuals, families, and groups in a variety of community health care settings.

NURS 4355. Leadership and Management.  
Lec. 3. Credit 3.  
Corequisite: NURS 4451. Introduction to concepts of leadership and management in nursing; preparation for role transition from student to graduate.

NURS 4351. Leadership and Management: Lab.  
Corequisite: NURS 4450. Clinical experiences applying concepts of management and leadership.

Electives

NURS 3450. Personal Wellness Management.  
Lec. 3. Credit 3.  
Holistic approach to assisting individuals in the promotion of wellness including: health guidance, nutrition, stress reduction, and fitness.

NURS 4360. Oncology Nursing.  
Lec. 3. Lab. 1. Credit 3.  
Prerequisite: NURS 4250 and 4251 or consent of instructor. Focus on oncology nursing and hospice concepts used to provide care for the clients with cancer in a community or
NURS 4370. Preparation for Parenting.  Lec. 3. Credit 3. 
Prerequisite: Sophomore standing or consent of instructor. 
Focus on parenting skills with infants and children and labor, 
delivery, and newborn care.

NURS 4400. Introduction to Critical Care Nursing.  Lec. 3. Credit 3. 
Prerequisite: Consent of instructor. Developing critical care 
assessment skills, emphasizing nursing decision-making, 
problem-solving, and intervention.

Prerequisite: Consent of instructor. Care of clients with 
cardiovascular and respiratory deficits requiring invasive, 
therapeutic nursing interventions; cardiac dysrhythmias.

NURS 4500. School Health Nursing.  Credit 3. 
Prerequisite: Senior nursing major or RN degree. Introduction 
to school health nursing and the role of the school nurse as 
caregiver, coordinator, manager, consultant, and leader. This 
course provides registered nurses with the necessary 
beginning skills to manage a comprehensive school health 
program.

NURS 4610. Summer Clinical Extern.  Credit 3. 
Prerequisite: NURS 3360 and NURS 3361. Skill-oriented 
clinical experience based on nursing process in the clinical 
area of the acute care or extended care facility.

NURS 4700. Adventures in Global Awareness: Expanding 
The course provides a trans-cultural experience through 
international travel and self exploration to increase personal 
and cultural awareness, sensitivity, and respect.

Prerequisite: PSY 3200 or PSY 3300 or SOC 1010. Physical 
and psychosocial aging processes. Issues in the care of the 
senior adult.

NURS 4990. Special Topics.  Credit 1-3. 
Directed study and research on a selected topic. Available to 
students on an individual basis, with consent of the Dean, as 
faculty load permits.

Philosophy (PHIL)

◆ PHIL 1030. Introduction to Philosophy.  Lec. 3. Credit 3. 
Prerequisite: Completion of two semesters of college work. 
Introduction to central problems of the nature of humanity, 
ethics, religion, justice, and knowledge of reality.

PHIL 2250. Introductory Ethics.  Lec. 3. Credit 3. 
Prerequisite: Completion of two semesters of college work. 
Appraisal of conduct and moral reasoning by the study of 
contemporary theories of the good life and their bearing upon 
contemporary moral issues.

PHIL 3010. Philosophy of Religion.  Lec. 3. Credit 3. 
Prerequisite: Junior standing. Consideration of religious issues 
such as the nature of religious experience, existence and nature 
of God, verification of religious claims, and evil and human destiny.

PHIL 3310. History of Ancient and Medieval Philosophy.  Lec. 3. Credit 3. 
Prerequisite: Completion of two semesters of college work. Study of 
the most important philosophical systems which developed in the 
Mediterranean areas in Western Europe from the time of Socrates through St. Thomas Aquinas.

Prerequisite: Completion of two semesters of college work. Study of 
selected philosophical systems which developed in the 
Western World from the 1500s to the time of the 20th century.

PHIL 4010. The Nature of Knowledge.  Lec. 3. Credit 3. 
Prerequisite: Completion of two semesters of college work. Issues and problems concerning the nature and scope of 
knowledge: truth and evidence, skepticism and certainty, 
memory, and perception.

PHIL 4020. Comparative Religion.  Lec. 3. Credit 3. 
Prerequisite: Completion of two semesters of college work. Study of 
the great world religions with an emphasis on the 
distinctive concepts of each.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of philosophy where there is no appropriate course. May be taken twice, provided the topic is different.

PHIL 4960. Special Topics.  Credit 3. 
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue or interest area in philosophy.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Physical Education, Activity Courses (PHED)

PHED 0900. Conditioning and Agility.  Credit 0. 
Physical conditioning. Special emphasis on weights and agility 
drills.

PHED 1000, 1001. Modified Seasonal Sports.  Lab. 2. Credit 1. 
For students with physical limitations. Students are enrolled in this course on advice of their physicians.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHED 1010</td>
<td>Tennis</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1020</td>
<td>Swimming</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1030</td>
<td>Bowling (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1031</td>
<td>Advanced Bowling</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1040</td>
<td>Archery (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1050</td>
<td>Basketball for Women</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1060</td>
<td>Tumbling</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1070</td>
<td>Volleyball</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1080</td>
<td>Racketball and Handball (fee)</td>
<td>1</td>
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<tr>
<td>PHED 1090</td>
<td>Softball</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1100</td>
<td>Golf (fee)</td>
<td>1</td>
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<tr>
<td>PHED 1101</td>
<td>Advanced Golf (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1110</td>
<td>Badminton</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1120</td>
<td>Ballroom Dance</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1130</td>
<td>Modern Dance</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1140</td>
<td>Folk and Square Dance</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1150</td>
<td>Riflery (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1160</td>
<td>Scuba and Skin Diving (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1170</td>
<td>Karate</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1171</td>
<td>Kempojutsu Close quarters combat methods</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1172</td>
<td>Tai Chi/Qigong</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1173</td>
<td>Samurai Sword iaijutsu/kenjutsu</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1180</td>
<td>Self-Defense for Women</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1190</td>
<td>Water Aerobics</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1200</td>
<td>Beginning Foil Fencing</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1210</td>
<td>Clogging: Country and Western</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1220</td>
<td>Active Lifestyles and Health</td>
<td>1</td>
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<tr>
<td></td>
<td>Lec. 1 Lab. 1</td>
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<tr>
<td>PHED 1230</td>
<td>Map Reading/Orienteering</td>
<td>1</td>
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<tr>
<td>PHED 1240</td>
<td>Soccer</td>
<td>1</td>
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<tr>
<td>PHED 1250</td>
<td>Beginning West African Dance (also listed as MUS 1078)</td>
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</tr>
<tr>
<td>PHED 1260</td>
<td>Advanced West African Dance (also listed as MUS 1079)</td>
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</tr>
<tr>
<td>PHED 1290</td>
<td>Basketball for Men</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1300</td>
<td>Snow Skiing (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1310</td>
<td>Horsemanship (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1320</td>
<td>Ballet</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1360</td>
<td>Slimnastics and Aerobics</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1370</td>
<td>Weight Training and Physical Fitness</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1390</td>
<td>Firearm Safety, Hunting and Outdoorsmanship</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1420</td>
<td>Roller Skating (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1430</td>
<td>Jazz Dance</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1440</td>
<td>Skeet and Trap Shooting (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1441</td>
<td>Skeet and Trap Shooting Competition (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1470</td>
<td>Handgun Familiarization and Safety (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1590</td>
<td>Back Country Adventure I</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1600</td>
<td>Back Country Adventure II</td>
<td>1</td>
</tr>
<tr>
<td>PHED 2100</td>
<td>Life Guard Training (also listed as EXPW 2100)</td>
<td>2</td>
</tr>
<tr>
<td>PHED 3050</td>
<td>Water Safety Instructor's Course (also listed as EXPW 3050)</td>
<td>2</td>
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</table>

### Physical Education, Short Term Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHED 1510</td>
<td>Intermediate Snow Skiing (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1520</td>
<td>Canoe Camping (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1530</td>
<td>Backpacking Camping</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1550</td>
<td>Advanced Open Water Scuba Diving (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1560</td>
<td>Water Skiing (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1570</td>
<td>Bicycle Touring (fee)</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1580</td>
<td>Mountaineering</td>
<td>1</td>
</tr>
</tbody>
</table>

### Physical Education, Physical Activity Courses for Varsity Athletes and Cheerleaders

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHED 1870</td>
<td>Varsity Softball</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1880</td>
<td>Varsity Riflery</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1900</td>
<td>Varsity Volleyball</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1910</td>
<td>Varsity Football</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1920</td>
<td>Varsity Basketball for Men</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1923</td>
<td>Varsity Basketball for Women</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1930</td>
<td>Varsity Baseball</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1940</td>
<td>Varsity Tennis for Men</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1943</td>
<td>Varsity Tennis for Women</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1953</td>
<td>Varsity Golf for Women</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1956</td>
<td>Varsity Golf for Men</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1963</td>
<td>Varsity Women's Cross Country</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1966</td>
<td>Varsity Men's Cross Country</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1970</td>
<td>Varsity Soccer</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1980</td>
<td>Varsity Women's Track and Field</td>
<td>1</td>
</tr>
<tr>
<td>PHED 1990</td>
<td>Varsity Cheerleading</td>
<td>1</td>
</tr>
</tbody>
</table>

Only varsity athletes and cheerleaders may enroll in the varsity sports courses listed above. Those who are working toward licensure in Health and Physical education may use only one credit hour of the Varsity Sports series for licensure purposes. Only three semesters of varsity sports can be taken without a repeat card.

### Physics (PHYS)

A student may not earn credit in both PHYS 2010 and PHYS 2110 or in both PHYS 2020 and PHYS 2120. Credit will not be given for both PHYS 1310 and any of the above courses.

### PHYS (CSC) (MATH) 1020. First-Year Connections.

Rec. 2. Credit 1.

This course is intended as a bridge course for students entering TTU from high school. The course is designed to strengthen the student’s connection to TTU, the College of Arts and Sciences, and the appropriate department (CSC, MATH, or PHYS) by focusing on the enhancement of skills needed for academic success. This course engages the student in meaningful academic and non-academic out-of-the-classroom activities, as learning occurs both in and out of the classroom. It emphasizes critical thinking, the formation of academic and social goals and support groups, and time-management and study skills.
Tennessee Technological University

**PHYS 1100. Acoustics of Music.** Lec. 3. Credit 3.
Prerequisite: Background knowledge of high school algebra and geometry. Physical principles of sound as it relates to music, acoustics of musical instruments, auditorium acoustics and sound reinforcement, and sound recording and reproduction. This course will not count as part of a physics sequence.

◆**PHYS 1310. Concepts of Physics.**
Lec. 2. Lab. 3. Credit 3.
Prerequisite: One semester of college-level mathematics (numbered 1000 or higher) and background knowledge of high school algebra and geometry. Selected topics from classical and modern physics with applications to familiar phenomena, including the environment. This course will not count as part of a physics sequence.

Prerequisite: Consent of chair and instructor. (Up to six credits may be earned under this course title.) Topics covered will be chosen on the basis of student interest and need.

◆**PHYS 2010. Algebra-based Physics I.**
Lec. 3. Lab. 3. Credit 4.
Prerequisite: Background knowledge of high school algebra and geometry. Basic laws of classical mechanics, waves and heat with elementary applications to familiar phenomena.

◆**PHYS 2020. Algebra-based Physics II.**
Lec. 3. Lab. 3. Credit 4.
Prerequisite: PHYS 2010. Basic laws of electromagnetism and light with elementary applications and brief introduction to modern physics.

◆**PHYS 2110. Calculus-based Physics I.**
Lec. 3. Credit 3.
Prerequisite: MATH 1920. (May be taken concurrently.) Introduction to classical mechanics, mechanical waves, and thermodynamics.

◆**PHYS 2111. Calculus-based Physics Laboratory I.**
Lab. 3. Credit 1.
Prerequisite: PHYS 2110. (May be taken concurrently). Experiments in classical mechanics, mechanical waves and thermodynamics.

**PHYS 2112. General Physics I Honors Recitation.**
Rec. 1. Credit 0.
Corequisite: PHYS 2110. Selected topics to add depth to the understanding of material in PHYS 2110. Honors students can receive honors credit for PHYS 2110 by satisfactorily completing this course and obtaining a grade of A or B in PHYS 2110.

◆**PHYS 2120. Calculus-based Physics II.**
Lec. 3. Credit 3.
Prerequisite: PHYS 2110 and either MATH 2110 or MATH 2120. (MATH 2110 or MATH 2120 may be taken concurrently). Introduction to classical electromagnetism and optics. A student may not earn credit in both PHYS 2110 and PHYS 2110 or in both PHYS 2020 and 2120. Credit will not be given for both PHYS 1310 and any of the above courses.

◆**PHYS 2211. Calculus-based Physics Laboratory II.**
Lab. 3. Credit 1.
Prerequisite: PHYS 2111, PHYS 2120. (PHYS 2120 may be taken concurrently). Experiments in classical electromagnetism and optics.

**PHYS 2420. Modern Physics.** Lec. 3. Credit 3.
Prerequisite: PHYS 2120. Introduction to modern physics. Topics include special relativity, quantum theory of light, wave nature of matter, Bohr's theory of the atom, quantum mechanics in one dimension. Selected topics from atomic, molecular, solid state, nuclear, and particle physics.

**PHYS 2920. Mathematical Physics.** Lec. 3. Credit 3.
Prerequisite: PHYS 2120 and MATH 2110. Mathematical methods for classical and modern physics. Selected topics from vector analysis, complex analysis, and vector spaces, with emphasis on applications to physical systems. (PHYS 2120 and MATH 2110 may be taken concurrently).

**PHYS 3120. Statistical Thermal Physics.** Lec. 3. Credit 3.
Prerequisite: PHYS 2420, PHYS 2920, and MATH 2120. Development of the laws of thermodynamics using statistical mechanics.

**PHYS 3610. Classical Mechanics.** Lec. 3. Credit 3.
Prerequisite: PHYS 2920 and MATH 2120. Theoretical development of classical mechanics, including Newtonian, Lagrangian, and Hamiltonian descriptions.

**PHYS 3810. Quantum Mechanics I.** Lec. 3. Credit 3.
Prerequisite: PHYS 2420, PHYS 2920, and MATH 4510 (5510). (MATH 4510 (5510) may be taken concurrently). Introduction to principles of quantum mechanics.

**PHYS 3820. Quantum Mechanics.** Lec. 3. Credit 3.
Prerequisite: PHYS 3810. Application of quantum mechanics to simple systems.

**PHYS 4120. Advanced Modern Physics.** Lec. 3. Credit 3.
Prerequisite: PHYS 3820. Applications of quantum mechanics to selected topics from atomic physics, molecular physics, solid state physics, nuclear and particle physics, and astrophysics.

**PHYS 4610. Classical Electricity and Magnetism I.** Lec. 3. Credit 3.
Prerequisite: PHYS 2120, PHYS 2920 and MATH 4510 (5510). (MATH 4510 (5510) may be taken concurrently). Theory of electrostatics, electrodynamics, Maxwell's Equations, and boundary value problems.

**PHYS 4620. Classical Electricity and Magnetism II.** Lec. 3. Credit 3.
Prerequisite: PHYS 4610 and PHYS 2420. (PHYS 2420 may be taken concurrently.) Applications of Maxwell's Equations to electromagnetic waves and other phenomena. Relativistic electrodynamics.
PHYS 4710-4720. Advanced Experimental Physics.  
Lab. 8. Credit 4.  
Prerequisite: Consent of instructor. The student will perform selected experiments in classical and modern physics. Emphasis will be placed on computer-based data analysis and development of appropriate oral and written presentation techniques.

PHYS 4900. Selected Topics in Physics.  
Credit 1 to 4.  
(Up to eight credits may be earned under this course title). Topics covered will be chosen on the basis of student interest and need.

PHYS 5900. Selected Topics in Physics.  
Credit 3, 6, 9.  
Topics covered will be chosen on the basis of student interest and need.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Political Science (POLS)

◆ POLS 1000. American Government.  
Lec. 3. Credit 3.  
American systems of constitutional governance; emphasis on the major institutions and policies.

POLS 1100. Introduction to Political Science.  
Lec. 3. Credit 3.  
Overview of political science and its subfields: American politics, comparative politics, political behavior, international relations and political theory. Focus on core questions in the discipline as well as the development of writing and critical thinking necessary for upper-division courses in the major.

POLS 2230. Mock Trial I.–Fall.  
Lec. 2. Lab 2. Credit 2.  
Prerequisite: Sophomore standing or consent of instructor. Introduce the arts of persuasion in mock trial cases of civil law or criminal law, and emphasis courtroom demeanor and learning rules of evidence. You participate actively in a Tennessee invitational intercollegiate scrimmage in November. (Students may repeat once for a total of four credits, three of which may be counted an "approved course" in the major.)

POLS 2240. Mock Trial II.–Spring.  
Lab 1. Credit 1.  
Prerequisite: POLS 2230 or consent of instructor. Intensive individual and teamwork preparation for competition of case learned in fall semester, with emphasis on participation at regional competition for possible advancement to semi-finals and/or finals. (Students may repeat once for a total of two credits.)

POLS 3000. Data Analysis.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Computer aided data analysis. Emphasis on statistical analysis of political variables.

POLS 3200. American Political Thought.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Survey of American political theory.

POLS 3300. Introduction to Latin American Politics.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Survey of selected Latin American political systems.

Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Focus on the internal politics of selected developing nations.

POLS 3320. U.S. Policy Toward Latin America.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Focus on U.S. foreign policies that have an impact on Latin America and the Caribbean.

POLS 3330. State and Local Government.  
Lec. 3. Credit 3.  
Comparative study of state executives, legislatures, judiciaries, and policies; overview of counties and municipalities.

POLS 3400. Gender and Politics.  
Lec. 3. Credit 3.  
Role of gender in American politics and public policy, emphasizing the influence of political theories on individual world views.

POLS 3610. International Politics.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Analysis of foreign policy conceptions and factors that affect relations among nations.

POLS 3650. International Organizations.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Analysis of international organizations.

POLS 3670. Foreign Policy.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Development and the formulation of U.S. foreign policy.

POLS 3700. The Legislative Process.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. The origins, organization and functions of legislatures.

POLS 3710. The American Executive.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. A comparative study of governmental executives.

Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Survey of American state and federal court systems, using qualitative and quantitative methods.

POLS 4100. International Law.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Analysis of the nature, development, and concepts of international law.

POLS 4210. American Political Parties.  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Study of
political parties, pressure groups, and public opinion.

**POLS 4310. Constitutional Law I: Struggle for Federal Powers and Accountability.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor.  
Recommended POLS 3810. Landmark cases in powers of the judiciary, presidency, Congress, and states' rights, with a Moot Court Term project.

**POLS 4320. Constitutional Law II: Civil Liberties and Civil Rights.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of instructor.  
Recommended POLS 3810 and POLS 4310. Landmark cases in the development of civil liberties and civil rights of individuals with a Moot Court term project.

**POLS 4400. Political Satire.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Study of political satire from the ancients to postmodern influences with an evaluation of the contemporary study of popular culture.

**POLS 4410. Political Theory: Ancient and Medieval.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Analysis of political thought from ancient Greece to 1500.

**POLS 4420. Political Theory: Early Modern.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Analysis of political thought from 1500 toward the present.

**POLS 4510. Comparative Government: Europe.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. A comparison of the political systems of Europe.

**POLS 4610. Public Administration and Public Policies.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Theory and cases in public administrative organizations and controls.

**POLS 4900. Independent Study.**  
Credit 3.  
Prerequisite: Consent of the instructor. Supervised research and reading in any area where there is no appropriate course offering. May be taken twice, provided the topic is different.

**POLS 4910. Seminar in Public Law.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Advanced readings in human rights issues.

**POLS 4911-19. Special Projects.**  
Credit 3  
Prerequisite: POLS 1000 or consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in political science.

**POLS 4920. Seminar in Comparative Politics.**  
Lec. 3. Credit 3.  
Prerequisite: POLS 1000 or consent of the instructor. Advanced reading and research on selected topics in comparative politics.

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**POPC 4010 (5010). Topics.**  
Lec. 1-3. Credit 1-3.  
Special topics in popular culture.

**POPC 4050 (5050). Science Fiction and Fantasy.**  
Lec. 3. Credit 3.  
Analysis and discussion of themes, conventions, and stereotypes in short stories, novels, and films.

**POPC 4060 (5060). Detective Fiction.**  
Lec. 3. Credit 3.  
Private detectives, policemen, and spies in fiction.

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**PC 2500. Communicating in the Professions.**  
Lec. 3. Credit 3.  
Prerequisite: ENGL 1020 or concurrent enrollment in ENGL 1020. Overview of skills and principles related to oral communications in various professions.

**PC (ENGL) 3250. Professional Communication I.**  
Lec. 3. Credit 3.  
Prerequisite: ENGL 1020. The preparation of effective technical and professional reports; the preparation and delivery of effective oral reports. (Same as ENGL 3250.)

**PC (WEBD) 3500. Web Site Construction/The Rhetoric of Internet Publishing.**  
Lec. 3. Credit 3.  
Prerequisite: ENGL 1020 Instruction in web site analysis and document design, including background in rhetorical theory and principles.

**PC 3700. Technical Documents in the Professions.**  
Lec. 3. Credit 3.  
Prerequisite: ENGL 3250 or PC 3250. Practical experience in developing various technical documents required of persons working in professional communications. Students will focus in depth of these documents and in the technologies used to develop and publish such documents.
PC 3750. Ethics in the Professions. Lec. 3. Credit 3.
Prerequisite: ENGL 1010 and ENGL 1020. Overview of multidisciplinary ethical issues that affect all disciplines, including privacy, social responsibility, informed consent, morality, responsibility, and professional codes of ethics. The course focuses on case studies of ways these issues apply in various professions.

PC (JOUR) 4230 (5230). Free Lance Writing.--Spring.
Lec. 3. Credit 3.
Writing and marketing of feature stories, commentaries, and articles.

PC (JOUR) 4360 (5360). Magazine Production and Design.--Spring.
Lec. 3. Credit 3.
Current trends in magazine production and design.

PC (JOUR) 4460 (5460). Public Relations--Cases and Practices.--Fall (O).
Lec. 3. Credit 3.
Prerequisite: JOUR 3460. Practical aspects of public relations emphasized. Case studies considered. Builds on knowledge and expertise acquired in JOUR 3460.

PC 4830 (5830). Free Lance Writing.--Spring.
Lec. 3. Credit 3.
Prerequisite: JOUR 3220. Recommended: JOUR 4820 (5820). Writing and marketing of feature stories, commentaries, and articles.

PC 4840 (5840). Special Problems. Credit 3.
Prerequisite: Senior standing or consent of instructor. Independent work in mass media research and report writing or internship programs in print or electronic media, public relations, and other areas.

PC 4850 (5850). Internship. Credit 3, 6, 9.
Part-time or full-time employment in a business, industrial, or institutional communications setting related to student academic and career goals.

PC (JOUR) 4940 (5940). Technical Editing.--Spring.
Lec. 3. Credit 3.
Prerequisite: PC 4970 (5970) Principles and practices of technical editing.

PC (ENGL) 4970 (5970). Professional Communication II.--Fall.
Lec. 3. Credit 3.
Prerequisite: ENGL 3250 or PC 3250. A continuation of PC 3250 with emphasis on more complex reports.

PC 4990. Seminar in Professional Communication.
Lec. 3. Credit 3.
Prerequisite: PC 4970. Theory and practical experience developing business and grant proposals.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Psychology (PSY)

Introduction to methods and findings of contemporary psychology. Emphasis on psychological basis for understanding human behavior. Consideration of maturation, learning, thinking, motivation, emotion, sensation, perception, and personality.

PSY 2050. Psychology of Adjustment. Lec. 3. Credit 3.
Behavior and adjustment in modern society, maturing self concept, adjustment to psychological stress, and prevention of maladjustment.

PSY 3000. Problem Solving. Lec. 3. Credit 3.
Introduction to concepts and methods used in problem-solving.

Prerequisite: PSY 2010. Fundamental statistics for the behavioral sciences, descriptive uses, probability, one-way, factorial designs, repeated measures and split-plot designs, bivariate correlation and regression, and non-parametrics.

PSY 3110. Experimental Psychology. Lec. 3. Lab. 2. Credit 4.
Prerequisite: Minimum grade of C in PSY 3010. Methods and techniques of research in general experimental psychology. Emphasis on design, data collection, analysis, and report writing.

PSY 3140. Experimental Social Psychology. Lec. 2. Lab. 2. Credit 3.
Prerequisite: PSY 3110 Experimental testing of theories and models, experimental social designs and problems, and assigned and original laboratory projects.

Prerequisite: PSY 2010 Experimental methods used in the study of memory, thinking and cognition.

Prerequisite: PSY 3010. Examination of methods used to research psychological questions of an applied nature in specialties such as industrial, health, consumer, and community psychology. Topics include survey, evaluation, and quasi-experimental research methods.

PSY 3200. Developmental Psychology. Lec. 3. Credit 3.
Developmental aspects of psychological functioning from the prenatal period to adulthood with emphasis on individual differences.

PSY 3300. Introduction to Social Psychology. Lec. 3. Credit 3.
Prerequisite: PSY 2010. Introduction to methods in social psychology and processes of social influence.
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**PSY 3400. Industrial Psychology.** Lec. 3. Credit 3.
Introduction to the areas of employee selection, training, performance appraisal, theories, work motivation, and development.

**PSY 3410. Group Dynamics.** Lec. 3. Credit 3.
Group development, the individual in group processes, interaction, leadership, and decision-making.

**PSY 4050 (5050). Learning and Cognition.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Theory, research and applications in human learning, memory and cognitive processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4100 (5100). Child Psychology.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Hereditary and environmental influence on physical and psychological growth. Cognitive, affective and language development of infant and child with an emphasis on disorders and problems in development. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4130 (5130). Physiological Psychology.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Biological approach to understanding behavior. Students will focus on the anatomy and physiology of the nervous system in reference to behavior, perception, mental disorders, and drug action. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4140 (5140). Health Psychology.** Lec. 2. Lab. 2. Credit 3.
Prerequisite: PSY 3110. Biopsychosocial approach to examining how stress, personality and lifestyle are related to physical health. Students will experientially explore a variety of coping strategies and relaxation techniques geared toward self-assessment and understanding. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4150 (5150). Psychology of Personality.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Application of psychological principles to an understanding of personality, development, and interpersonal adjustments. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4160 (5160). Abnormal Psychology.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Nature of abnormal behavior, etiology, symptomatology and treatment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4200 (5200). Adolescent Psychology.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Origin and principles of behavior with emphasis on educational problems in guiding growth and development in adolescents. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

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level course will be required to complete additional work as stated in the syllabus.

**PSY 4250 (5250). Introduction to Psychological Testing.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Basic concepts in psychological testing, interpreting test scores, and types of standardized tests. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4300 (5300). Adult Psychology.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Physical, cognitive, and psychological development in young adulthood, middle age, and old age. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4320 (5320). Introduction to Therapeutic Techniques.** Lec. 3. Credit 3.
Prerequisite: PSY 4150 (5150) and PSY 4160 (5160). An introduction to various therapeutic techniques including analytic, nondirective, in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4400 (5400). Psychopharmacology.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. An introduction to the psychological and physiological impact of drugs. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4600 (5600). Microcomputers in Psychological Research.** Lec. 1. Lab. 4. Credit 3.
Prerequisite: PSY 2010. Introduction to the use of computers in psychological research. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4800 (5800). History of Psychology.** Lec. 3. Credit 3.
Prerequisite: PSY 2010. Theoretical systems, experiments and prominent figures in the development of modern psychology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY (NURS) (SOC) 4810 (5810). Concepts of Gerontology.** Lec. 3. Credit 3.
Prerequisite: PSY 3200 or PSY 3300 or SOC 1010. Physical and psychosocial aging processes. Issues in the care of the senior adult.

**PSY 4903 (5903). Special Topics** Credit 3.
Prerequisite: Junior standing required. Concentration on a special topic in psychology. Course may be repeated if topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

**PSY 4913 (5913). Special Topics.** Credit 3.
Prerequisite: Junior standing required. Concentration on a special topic in psychology. Course may be repeated if topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.
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PSY 4921, 4922, 4923 (5920). Special Topics. Credit 1, 2, 3.
Concentration on a special topic in psychology. Course may be repeated if topic is different. Junior standing required. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Prerequisite: Minimum grade of C in PSY 3110. Capstone experience that requires students to conduct an original research project which ties together previously learned statistical methods, research skills, and oral/written communication skills. Students complete all work through the presentation of the research proposal.

Prerequisite: PSY 4930. Capstone experience that requires students to conduct an original research project which ties together previously learned statistical methods, research skills, and oral/written communication skills. Students complete the data collection, statistical analyses, and final manuscript.

PSY 4940. Practicum in Psychology. Credit 1-3.
Prerequisite: Junior standing required. Supervised application of psychology in educational, therapeutic, or commercial institutions.
◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Reading (READ)

Improvement of reading and study skills, including vocabulary, spelling comprehension, and rate.

READ 3300. Teaching of Reading. Lec. 3. Credit 3.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: For CFS majors: ECED 3300, ECED 3310, and LSCI 4500; Corequisites for MDHL majors: FOED 3810 and LSCI 4500. No corequisites for Modified SPED majors. Methods of teaching reading with emphasis on the primary grades.

READ 3301. Teaching of Reading. Lec. 3. Credit 3.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: For MDHL and MDSS majors: FOED 3810 and LSCI 4500. No corequisites for Modified SPED majors. Methods of teaching reading with emphasis on the middle grades.

READ 3311. Literacy I. Lec. 7. Credit 7.
Prerequisite: Full admission to the Teacher Education Program. This course is an integration of concepts fundamental to the development of literacy from birth through middle grades. It includes a study of children's literature, language development and communication skills, language arts, and the assessment and selection of appropriate instructional strategies based upon student need.

READ 3312. Literacy II. Lec. 5. Credit 5.
Prerequisite: Full admission to the Teacher Education Program. This course is an integration of concepts fundamental to the development of literacy from birth through middle grades. It includes a study of language development and communication skills, language arts, content area reading, and the assessment and selection of appropriate instructional strategies based upon student need.

READ 3350. Teaching Reading in the Content Areas. Lec. 3. Credit 3.
Prerequisite: Full admission to the Teacher Education Program. Emphasis on skills needed for content area reading and selection of materials and appropriate techniques for diverse learners.

READ (LSCI) 4020 (5020). Storytelling and Traditional Literature. Lec. 3. Credit 3.
Storytelling techniques and literature presentation through storytelling.

Prerequisite: Full admission to the Teacher Education Program, READ 3300 or READ 3301 or consent of instructor. Holistic views of reading and writing, naturalistic assessment, and appropriate intervention strategies.

READ 4411 (5411). The Reading-Writing Connection: Secondary. Lec. 3. Credit 3.
Prerequisite: Full admission to the Teacher Education Program. Corequisite: READ 3350. Explores the connection between the reading and writing process as a means of mutual improvement.

Introduction to preschool trade books and related materials reflecting an understanding of multiethnicity.

Introduction to children's trade books and related materials reflecting an understanding of multiethnicity.

Introduction to adolescent and adult trade books and related materials reflecting an understanding of multiethnicity.

READ (LSCI) 4570 (5570). Books and Related Materials for Adolescents and Adults. Lec. 3. Credit 3.
Survey of books and materials for middle level, high school students, and adults focusing on techniques to assist in reading these materials with understanding.

Secondary Education (SEED)

SEED 4120 (5120). Materials and Methods of Teaching English. Lec. 3. Credit 3.
Prerequisite: Admission to Teacher Education Program; CUED 4150; FOED 3830; READ 4410 or READ 4411 (5411); and SPCH 2410. Corequisite: FOED 3820. Prerequisite or Corequisites: Any two of the following: ENGL 3810, ENGL 3815, SEED 3820, and SPCH 2410.
SEED 4211 (5121). Materials and Methods of Teaching Career Technical Education. Lec. 3. Credit 3.
Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Principles, objectives, techniques, and evaluation in secondary school teaching of industrial education.

SEED 4212 (5122). Materials and Methods of Teaching Mathematics. Lec. 3. Credit 3.
Prerequisite: Admission to the Teacher Education Program. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of mathematics.

SEED 4213 (5123). Materials and Methods of Teaching the Sciences. Lec. 3. Credit 3.
Prerequisite: Admission to the Teacher Education Program. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of the sciences.

SEED 4214 (5124). Materials and Methods of Teaching Social Studies. Lec. 3. Credit 3.
Prerequisite: Admission to the Teacher Education Program. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of social studies.

SEED 4215 (5125). Materials and Methods of Teaching Foreign Language. Lec. 3. Credit 3.
Prerequisite: Admission to the Teacher Education Program. Corequisite: FOED 3820. Principles, objectives, techniques, and evaluation in secondary school teaching of foreign languages.

Prerequisite: full admission to the second level. Exploring technologies specific to mathematics teaching and appropriate applications of these technologies in the classroom.

SEED 4870. Student Teaching I. Credit 5.
Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Corequisite: SEED 4880 and SEED 4890 Activities directly related to teaching performance, planning and presenting lessons, directing study, and classroom management.

SEED 4871. Residency I. Credit 5.
Corequisite: SEED 4872. Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

SEED 4872. Professional Seminar I. Credit 5.
Corequisite: SEED 4871. Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

SEED 4880. Student Teaching II. Credit 5.
Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Corequisite: SEED 4870 and SEED 4890. Continuation of SEED 4870 in a different setting.

SEED 4881. Residency II. Credit 10.
Corequisite: SEED 4882. Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

SEED 4882. Professional Seminar II. Credit 2.
Corequisite: SEED 4881. Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

Prerequisite: The prerequisite to all upper division education courses is full admission to the Teacher Education Program. Corequisite: SEED 4870 and SEED 4880. Seminar on issues related to the interrelationships among school, culture, and society; a historical, philosophical, and sociological analysis.

Sociology (SOC)

◆ SOC 1010. Introduction to Sociology. Lec. 3. Credit 3.
Fundamental concepts and basic principles underlying human social relations.

A course required for all sociology majors, designed to assist the student in acquiring basic knowledge and skills necessary to be a successful sociology major. Additional focus upon personal and academic adjustments to college in general. May be taken at the same time as SOC 1010. Must be taken at first opportunity after declaration of sociology as a major.

◆ SOC (ANTH) 1100. Introduction to Anthropology. Lec. 3. Credit 3.
Overview of the physical and cultural development of human beings from prehistoric times to the present.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Contemporary social problems.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Interaction between human cultural systems and the physical environment in prehistoric through modern times.

SOC 2110. Social Class and Inequality in America. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor.
Current and comprehensive description of the social class structure, socioeconomic inequality, and related politics of American society.

SOC 2630. Marriage and Family Relations. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. A sociological approach to marriage and family living, dating, male-female roles, mate selection, marital adjustment, parenthood, widowhood, divorce, and remarriage.

SOC (CJ) 2660. Criminology. Lec. 3. Credit 3.
Prerequisite: Sophomore standing. Crime, the criminal, and society's responses to the behavior.

SOC 2840. The Aged in American Society. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Analysis of social, psychological, and economic problems in aging.

Prerequisite: SOC 1010. Survey of the development of major schools of thought in modern sociology with instruction and evaluation in oral presentations.

SOC 3150. Social Psychology. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. This course will examine how individuals shape and are shaped by their social situations. There will be a particular emphasis on the symbolic interaction perspective with the goal of helping students better understand their identities and social interactions.

SOC 3200. Sociology of Sex and Gender. Lec. 3. Credit 3.
Prerequisite: SOC 1010. A sociological perspective on the development and operation of gender with emphasis on social structure and culture.

SOC 3300. Occupational Sociology. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. The social dimensions of occupations (both legitimate and deviant) with an emphasis on the troubles and tensions workers encounter.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Applications of sociological knowledge and its relation to the context of interaction between sociologists and policy-makers.

SOC 3600. Environmental Sociology. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Explores the relationship between society and the physical environment with emphasis on environmental usage patterns, environmental justice issues, and the causes and consequences of environmental pollution and over-population problems, with an orientation toward possible solutions of these problems.

SOC (CJ) 3650. Juvenile Delinquency. Lec. 3. Credit 3.
Prerequisite: Sophomore standing and SOC 1010. The study of the causes of juvenile misconduct, possible responses to the problem, and the system of juvenile justice.

SOC 3710. Urban Sociology. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. History of urbanization. Analysis of contemporary urban society and its social problems.

SOC 3720. Rural Sociology. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Development of rural society, its relationship to urban society, and contemporary rural social problems.

SOC 3730. Technology and Society. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Relationships of different types of technologies to different types of social and cultural systems.

SOC (SW) 3900. Introduction to Social Research. Lec. 3. Credit 3.
Prerequisite: SOC 1010 and three hours of sociology or consent of instructor. Methods of sociological research including considerations of research design, strategies, techniques and procedures.

SOC 3910. Social Science Statistical Analysis. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or CJ 2660 or SW 1800. Introduction to basic statistics and their uses in the social sciences.

Prerequisite: Sophomore standing and SOC 1010 or CJ 2660 or SOC 2660. Organized crime in America as a product of legal, historical, cultural, and economic forces.

SOC (ANTH) (CJ) 4040 (5040). Law and Culture. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. A comparative cross-cultural analysis of primitive, traditional, and modern attitudes toward law, social control, punishment, and individual responsibility.

SOC 4080 (5080). Sociology of Appalachia. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of the instructor. An exploration of the people, culture, and political economy of Appalachia.

SOC 4090 (5090). Cross Cultural Communications and Cultural Diversity. Lec. 3. Credit 3.
An examination of the socio-cultural context of communication with emphasis upon enhancing communication skills across cultures.

SOC 4120 (5120). Sociology of Death and Dying. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. The social and cultural dimensions of death and dying in American society with emphasis on the meaning of death, the
Sociological analysis of alcohol abuse and alcoholism, issues in prevention and rehabilitation, and implications for education.

SOC 4210 (5210). Race, Ethnicity and Multiculturalism. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Ethnic and cultural variations in the U.S. and similar mass societies. Emphasis on economic, political, and social relationships between ethnic groups.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Historical and organizational analysis of various mass media and their content. Social issues and the mass media.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Cross-cultural analysis of religion as a social factor at the societal, organizational, and personality systems levels.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Sociological analysis of the interrelationship between particular population characteristics and patterns of social organization.

SOC 4430 (5430). People in Organizations. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Analysis of the structures and processes of large bureaucratic organizations with emphasis on individuals' relationships to them.

SOC 4500 (5500). Sociology of Alcohol Abuse and Alcoholism. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Sociological analysis of alcohol abuse and alcoholism, issues in prevention and rehabilitation, and implications for education.

SOC 4510 (5510). Social Deviance. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Examination of various groups who are identified as deviant due to their unacceptable behavior and relative powerlessness.

SOC 4610 (5610). Contemporary American Family. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Models of family organization, variations in the institutional pattern, kinship, and basic social trends affecting the family.

SOC (CJ) (SW) 4660 (5660). Corrections. Lec. 3. Credit 3.
Prerequisite: Sophomore standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Correctional services, practices, and issues with particular attention to the maximum security adult institution.

Prerequisite: PSY 3200 or PSY 3300 or SOC 1010. Physical and psychosocial aging processes. Issues in the care of the senior adult.

SOC 4830 (5830). Medical Sociology. Lec. 3. Credit 3.
Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Examination of the significance of the complex relationship between attitudes, beliefs relating to the underlying causes of disease, the level of health characteristics, appropriate treatment practices, and the role of the healer in various groups and societies.

Prerequisite: SOC 1010 or SOC 1100 or consent of instructor. Analysis of social movements and other kinds of planned and unplanned change in society.

SOC (CJ) (SW) 4900 (5900). Internship. Credit 3.
Prerequisite: Nine hours of sociology. See instructor prior to enrolling. Students are placed with and work in a public or private agency which is compatible with their interests. (Students may take a maximum of two internships for up to a total of 6 hours of Internship. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements with any additional hours counting as upper division general elective hours).

Prerequisite: Nine hours of sociology. Six hour internships are only available for internships that offer special opportunities that are not available in a 3 hour internship. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 6 hours of credit.

SOC 4920 (5920). Data Analysis and Management. Lec. 3. Credit 3.
Prerequisite: SOC 3900 and SOC 3910. The techniques of management and analysis of quantitative social science data from primary and secondary sources.

Prerequisite: Nine hours of sociology. Nine hour internships are only available for internships that offer special opportunities that are not available in a 3 or 6 hour internship. The great majority of these will be summer internships that require the intern to work a 40 hour week. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 9 hours of credit.

Prerequisite: SOC 3900 or consent of instructor. An in-depth examination and direct involvement with various qualitative
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research tools and techniques used by sociologists.

SOC (CJ) (SW) 4940, 4941; 4948, 4949; 4950, 4951. Independent Study. Credit 1.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ) (SW) 4970-4979 (5970, 5980, 5990). Special Topics. Credit 1.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ) (SW) 4980-4989 (5970, 5980, 5990). Special Topics. Credit 2.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC (CJ) (SW) 4990-4998 (5970, 5980, 5990). Special Topics. Credit 3.
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC 4999. Senior Seminar. Lec. 3. Credit 3.
Prerequisite: SOC 3100, SOC 3910, SOC 4920 (5920) or SOC 4930 (5930), or by permission of instructor. Capstone course designed to be taken by sociology majors in the senior year. Course reviews major areas in the field of sociology in preparation for the Major Field Exam and in preparation for professional life.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

Social Work (SW)

An introduction to the organization and structure of professional social services including major interventional methods.

SW (SOC) 3900. Introduction to Social Research. Lec. 3. Credit 3.
Prerequisite: SOC 1010 and three hours of sociology or consent of instructor. Methods of sociological research, including considerations of research design, strategies, techniques, and procedures.

SW (CJ) (SOC) 4900, 4941; 4948, 4949; 4950, 4951. Independent Study. Credit 1, 1; 2, 2; 3, 3.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SOC 4990. Senior Seminar. Lec. 3. Credit 3.
Prerequisite: Sophomore standing and SOC 1010 or CJ 2660 or SOC 2660 or SW 1800. Probation and parole services with special attention to current practices and issues.

SW (CJ) (SOC) 4910 (5100). Internship. Credit 3.
Prerequisite: Nine hours of sociology. See instructor prior to enrolling. Students are placed with and work in a public or private agency which is compatible with their interests. (May be taken once for upper division credit to fulfill major or minor requirements and a second time as a general elective.)

SW 4915. Internship. Credit 6
Prerequisite: Nine hours of sociology. Six hour internships are only available for internships that offer special opportunities that are not available in a 3 hour internship. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 6 hours of credit.

SW (CJ) (SOC) 4925. Internship. Credit 9
Prerequisite: Nine hours of sociology. Nine hour internships are only available for internships that offer special opportunities that are not available in a 3 or 6 hour internship. The great majority of these will be summer internships that require the intern to work a 40 hour week. See instructor prior to enrolling to determine if an available internship opportunity qualifies for 9 hours of credit.

SW (CJ) (SOC) 4940, 4941; 4948, 4949; 4950, 4951. Independent Study. Credit 1, 1; 2, 2; 3, 3.
Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. Students may take a total of up to 6 hours of Independent Study hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SW (CJ) (SOC) 4980. Special Topics. Credit 2
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.

SW (CJ) (SOC) 4990. Special Topics. Credit 3
Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students may take a total of up to 6 hours of Special Topics hours with no more than 3 hours on a single topic. Up to 6 hours may be taken for upper division credit to fulfill major or minor requirements.
Special Education (SPED)

(O) and (E) Denote Odd and Even Years Respectively

SPED 1010. Orientation to Exceptional Individuals.
Lec. 2. Credit 2.
Introduction to categories and awareness of individual service needs and settings. Focus on issues and practices affecting individuals and families.

SPED 2010. Introduction to Special Education
Lec. 3. Credit 3.
Historical perspectives, current issues and professional practices which influence the education of exceptional persons.

SPED 2040. Special Education Procedures and Methods.
Lec. 3. Credit 3.
Prerequisite: SPED 2010 or consent of instructor. Overview of best practices in the delivery of special education and support services.

SPED 2821. Practicum: Special Education Procedures and Methods.
Lab. 4. Credit 1.
Prerequisite: SPED 2010 or consent of instructor. Corequisite: SPED 2040. Supervised observation, recording, and practice of methods and procedures used in special education.

SPED 3000. Teaching Persons with Disabilities in the Regular Classroom.
Lec. 3. Credit 3.
Prerequisite: Full admission to the second level. Alternatives in educational assessment, materials, methods, and procedures for the regular classroom teacher.

SPED 3010. Roles and Functions for Teaching Persons with Disabilities.
Lec. 3. Credit 3.
Prerequisite: SPED 2010 or consent of instructor. This course will alert the pre-service special educator to emerging concepts and problems and to the need to be adaptable to change.

Lec. 3. Credit 3.
Prerequisite: SPED 2010 or consent of instructor. Introduction to characteristics and to planning, designing, and selecting assessment and teaching methodologies.

SPED 3030. The Education of Persons with Learning Disabilities.
Lec. 3. Credit 3.
Prerequisite: SPED 2010. Introduction to Special Education. Historical perspectives, current issues, and professional practices which influences the education of exceptional persons.

SPED 3031. Physical Management and Support Services for Orthopedic, Motor and Health Impaired.
Lec. 3. Lab. 2. Credit 3.
Introduction to medical and educational support services. Emphasizes handling, instructional modifications, and support services.

SPED 3034. Evaluation and Assessment for Content Specific Areas for Children with Special Needs.
Lec. 3. Credit 3.
Prerequisite: SPED 2010, SPED 2040 and SPED 2821. Requires full admission to Teacher Education. Authentic, curriculum based, and standardized measurement for inclusion and self-contained students with special needs. Addresses IDEA 2004 and NCLB.

SPED (AGHT) 3480. Horticultural Therapy.–Spring (O).
Lec. 2. Lab. 2. Credit 3.
Introduction to the application of horticulture for special education and as therapy for treatment, rehabilitation, and/or training of individuals with disabilities.

SPED 3810. Practicum: Assessment Procedures in Special Education.
Lab. 3. Credit 1.
Prerequisite: Full admission to the second level. Corequisite: SPED 4320 (5320). Provides the student with the experience of administering, scoring, interpreting, and determining individual strengths and weaknesses.

Lab. 3. Credit 1.
Corequisite: SPED 4030. Application of the principles of behavior in applied settings.

SPED (SPCH) 4000 (5000). Introduction to Communication Disorders.
Lec. 3. Credit 3.
Principles of and therapeutic approaches to speech, language, and hearing disorders.

SPED 4030. Applied Behavior Analysis for Teachers.
Lec. 3. Credit 3.
Overview of the principles of behavior applied to instructional management.

SPED 4040 (5040). Introduction to Education of Gifted and Talented.
Lec. 3. Credit 3.
Topics to include: characteristics, incidence, identification, diagnosis, and educational needs of gifted and talented children/youth. Graduate would include but not limited to a case study of gifted person.

SPED 4050 (5050). Sign Language I.
Lec. 3. Credit 3.
Introduction to and development of a basic vocabulary in Signed English concepts in the use of alternative methods of communication.

Lec. 2. Credit 2.
Introduction to the educator's role in identifying, reporting, preventing, and intervening on behalf of abused and chronically neglected children and youth.

SPED 4090 (5090). Sign Language II.
Lec. 3. Credit 3.
Prerequisite: SPED 4050 (5050). Continuation of vocabulary development in Signed English and appreciation of practical situations in various professional fields.

SPED 4130 (5130). Methods for Teaching Persons with Mild and Moderate Disabilities.
Lec. 3. Credit 3.
Prerequisite: SPED 4320 (5320) and admission to the Teacher Education Program.
Tennessee Technological University

Education Program. Corequisite: SPED 4820. Designed to empower the pre-service special educator with skills necessary to implement an integrated curriculum in a variety of placements.

SPED 4140 (5140). Curriculum Development and Education of Gifted and Talented Children/Youth.
Lec. 3. Credit 3.
Topics to include: School programs, curricula, materials, and methods for the education of gifted and talented. Graduate would include but not limited to comparing and contrasting three models in gifted education.

SPED 4150 (5150). Speech and Language Acquisition and Development.
Credit 3.
Normal speech/language development, anatomy of speech structures, distinctive features, and implications of process and analysis systems.

SPED 4160 (5160). Speech Pathology in the Schools.
Credit 3.

SPED 4200 (5200). Teaching Students with Autism Spectrum Disorders.
Credit 3.
Within the context of persons with ASD, this course is designed to provide the student with a model of the teaching process progressing from identification, to instructional design, to the use of research-validated methods for instructional delivery and the provision of needed educational, social, academic, and behavioral supports.

SPED 4250. Reading and Research in Special Education.
Credit 1-3.
(SPED Faculty Sponsor required.) Individualized investigations of selected topics for undergraduate Special Education majors and minors. May be repeated for credit.

SPED 4320 (5320). Assessment Procedures in SPED.
Lec. 3. Credit 3.
Prerequisite: Full admission to the second level, SPED 2010 and SPED 2040. An indepth study of assessment instruments for the evaluation of persons with mild and moderate disabilities.

SPED 4340 (5340). Systematic Instruction of Persons with Comprehensive Disabilities.
Lec. 3. Credit 3.
Prerequisite: SPED 4030 and full admission to the second level. Corequisite: SPED 3821. Examination of assessment procedures, effective and efficient instructional approaches for achievement of learning mastery and proficiency.

SPED 4820. Practicum: Teaching Persons with Mild and Moderate Disabilities.
Lab. 2. Credit 2.
Prerequisite: Full admission to the second level. Corequisite: SPED 4130 (5130). Provides direct experience for the special educator in the implementation of instruction using a variety of stimulating environments.

SPED 4821. Practicum in Systematic Instruction.
Lab. 3. Credit 2.
Prerequisite: Full admission to the second level. Corequisite: SPED 4340 (5340). Implementation of effective and efficient instructional approaches in an applied setting.

SPED 4850 (5850). Workshop in Education.
Credit 1-6.
Laboratory approach providing opportunities for experienced education personnel to study indepth Special Education problems.

SPED 4870. Student Teaching I.
Credit 5.
Corequisite: SPED 4880 and SPED 4890. Activities directly related to teaching performance; planning and presenting lessons, directing study, and managing the classroom.

SPED 4871. Residency I.
Credit 5.
Performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

SPED 4872. Professional Seminar I.
Credit 5.
Seminar for residency I candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners.

SPED 4880. Student Teaching II.
Credit 5.
Corequisite: SPED 4870 and SPED 4890. Continuation of SPED 4870 in a different setting.

SPED 4881. Residency II.
Credit 10.
Performance based full time clinical experience in authentic settings involving planning appropriate instruction based on student's needs, demonstrating effective instructional strategies, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice.

SPED 4882. Professional Seminar II.
Credit 2.
Corequisite: SPED 4881. Seminar for residency II candidates supporting professional development in areas of planning, assessment, instruction, classroom management, communication and reflection.

Credit 2.
Corequisite: SPED 4870 and SPED 4880. Seminar on issues related to the interrelationships among school, culture, and society; a historical, philosophical, and sociological analysis.

Speech (SPCH)

(O) and (E) Denote Odd and Even Years Respectively

Lec. 3. Credit 3.
This course introduces students to the theories and practices of communication within the work place. It covers various
communication settings including interviewing, presentations, group work, meetings, and email.

◆ **SPCH 2410. Introduction to Speech Communication.** Lec. 3. Credit 3.
Introduction to the communication process, interpersonal communication, group discussion, and public speaking. Students are required to prepare and deliver speeches.

**SPCH 2800. Interviewing**
Lec. 3. Credit 3.
This course introduces students to the interpersonal communication aspects of the interviewing process. Students will learn the various types of interviews and their purpose. Students will plan and prepare interviews from the roles of the interviewee and interviewer.

**SPCH 3000. Computer Mediated Communication.** Lec. 3. Credit 3.
An examination of computer, internet, and digital interaction as a form of human communication achieved through computer technology. Analysis of how the use of electronic devices such as email, instant messaging, cell phones, internet, blogs, and video games affects interpersonal and group dynamics.

Prerequisite: Upper-division status or by permission of the instructor. The course introduces basic principles of critical perception and interpretation of the processes of visual communication/rhetoric in the mass media, fine arts, films, and photography.

**SPCH 3130. Speech Activities.** Lec. 3. Credit 3.
Prerequisite: Consent of instructor. For students interested in all forms of public speaking and contest work.

**SPCH 3610. Foundations of Speech.** Lec. 3. Credit 3.
Role of speech in society and education. Overview of topics germane to understanding effective speech.

**SPCH 3620. Intercultural Communication.** Lec. 3. Credit 3.
Theoretical and practical ideas to prepare students for cross-cultural interactions. Emphasis on interpersonal, face-to-face intercultural communication in various domestic and international settings.

**SPCH 3630. Discussion and Parliamentary Procedure.** Lec. 3. Credit 3.
Conduct of a meeting: panels, symposiums, and forums. Organization, planning, and participation in group discussion and conference.

**SPCH (SPED) 4000 (5000). Introduction to Communication Disorders.**--Spring (O). Lec. 3. Credit 3.
Principles of and therapeutic approaches to speech, language, and hearing disorders.

**SPCH (SPED) 4150 (5150). Speech and Language Acquisition and Development.**--Spring (E). Lec. 3. Credit 3.
Normal speech/language development, anatomy of speech structures, distinctive features and implications of process and analysis systems.

**SPCH 4410. Organizational Communication.** Lec. 3. Credit 3.
Prerequisite: Upper-division status in communication or by permission of the instructor. Approaches to the understanding of communicative cultures in modern organizations and their operant principles.

**SPCH 4430 (5430). Interpersonal Communication.** Lec. 3. Credit 3.
Communications theory applied to informal and face-to-face situations.

**SPCH 4540. Historic American Public Address.** Lec. 3. Credit 3.
This course is a critical survey of historic American public discourse from the founding of the nation to the end of WWII. Students will analyze historically significant speeches, their rhetorical design, and their influence on public opinion and policy.

**SPCH 4550. Contemporary American Public Address.** Lec. 3. Credit 3.
This course covers public oratory from WWII to the present. Students will read some major speeches that marked important social and political events and will examine the speeches’ influence on public belief and action.

**SPCH 4601, 4602, 4603. Special Topics in Speech Communication.** Lec. 3. Credit 1, 2, 3.
Prerequisite: Upper-division status; may be repeated to a maximum nine hours. Presentation of directed, individual research in selected topics in speech communication beyond regular course offerings. Topic will be specified at time of offering.

**SPCH 4620 (5620). Advanced Public Speaking.**-- Fall (E). Lec. 3. Credit 3.
Prerequisite: SPCH 2410. Advanced oral communications as practiced from the platform, with emphasis on special types of speaking.

**SPCH 4630 (5630). Persuasion.** Lec. 3. Credit 3.
Prerequisite: SPCH 2410 or consent of instructor. Promotes intellectual understanding and critical application of how individuals and groups influence the attitudes, beliefs, and behaviors of others.

**Study Abroad (SA)**

**SA 2010, 2020. ISEP Program.** Credit 0.
Study at an institution abroad as part of the International Student Exchange Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]

**SA 2110, 2120. Magellan Exchange Program.** Credit 0.
Study at an institution abroad as part of the Magellan Exchange Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]
SA 2210, 2220. Non-Affiliate Exchange. Credit 0.
An exchange for study abroad that is not a part of the affiliated program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange. A contract will be signed for those if Financial Aid is involved.]

SA 2310, 2320. TTU-Brazil Higher Education Consortia Program. Credit 0.
Study at a partner institution in Brazil as part of the TTU-Brazil Program. [Credit may be earned as part of the curriculum in your major. See advisor for approval of courses which apply to curriculum prior to the exchange.]

Tennessee Consortium for International Studies (TCIS)

TCIS 2990, 2991, 2992, 2993. TnCIS Program. Credit 3.
Study abroad with the Tennessee Consortium for International Studies.

TCIS 4990, 4991, 4992, 4993. TnCIS Program. Credit 3.
Study abroad with the Tennessee Consortium for International Studies.

Theatre (THEA)

(O) and (E) Denote Odd and Even Years Respectively

◆ THEA 1030. Introduction to Theatre. Lec. 3. Credit 3.
Theatre appreciation, designed to enhance the student's enjoyment of plays.

THEA 2100. Acting.--Fall (O). Lec. 3. Credit 3.
Readings, improvisations, scene study; voice and movement for the stage; and basic rehearsal techniques.

Practical experience on any phase of an English department production from playwriting to performance or committee or crew work. (Courses may be repeated for credit.)

THEA 2150. Oral Interpretation of Literature.--Fall (E). Lec. 3. Credit 3.
Style and structure of literature of specific types and periods as related to the response and performance of the oral interpreter.

Representative theatrical styles from the classical through contemporary periods.

THEA 3001. Theatre Special Topics.--Spring (O). Lec. 3. Credit 3.
Coursework chosen on the basis of student interest and need. (May be taken for credit more than once if the topic is different each time.)

THEA 3300. Stagecraft. Lec. 3. Credit 3.
Lecture-laboratory course covering basic elements of scenery construction, painting, lighting, stage-properties, costuming, and stage make-up.

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Prerequisite: THEA 2100. Advanced voice and movement study for the stage with an emphasis on period acting styles; in-depth script and character analysis; and advanced scene study.

THEA (ENGL) 4121 (5121). Shakespeare. Lec. 3. Credit 3.
Historical, thematic, and other approaches in the study of Shakespeare. (May be repeated once as an elective provided the course content is different.)

THEA 4300. Play Directing.--Fall (E). Lec. 3. Credit 3.
Script analysis and principles of direction. Students direct plays for public performance.

THEA 4400 (5400). Dramatic Literature. Lec. 3. Credit 3.
Study of representative plays drawn from the classical through contemporary periods.

Use of an individual's dramatic imagination as a learning and teaching device.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.

University Art (UNAR)

UNAR 1020. First Year Art Connections (Art Majors only). Rec. 1. Credit 1.
This course engages B.F.A. students in meaningful artistic, academic, and non-academic out-of-classroom activities, emphasizing critical thinking in the formation of academic and artistic goals and providing essential guidance in self-management, study skills, and artistic development.

University Business (UBUS)

Connects students to the university and College of Business environments through meaningful academic and non-academic, out-of-classroom activities. Emphasizes critical thinking in the formation of academic and social goals, group participation, and in self-management and study skills.

University Music (UNMU)

This course engages music students in meaningful artistic, academic and non-academic out-of-classroom activities, emphasizing critical thinking in the formation of academic and artistic goals and providing essential guidance in self-management, study skills, and artistic development.
University Pre-Professional (UNPP)

This course engages the student in meaningful classroom and out-of-classroom activities. It is intended for pre-professional health science students. It emphasizes information, activities, and requirements important to becoming competitive in a professional school application pool.

University Success (UNIV)

Prerequisite: Freshman standing. Engages the student in meaningful academic and non-academic, out-of-classroom activities. Emphasizes critical thinking in the formation of academic and social goals and support groups, and in self-management and study skills.

Enhanced presentation of study skills, time management, test-taking strategies, problem solving, and in depth work in one or more content areas of difficulty.

UNIV 1030 is a course designed to strengthen the student's connection to Tennessee Technological University by focusing on the enhancement of skills needed for academic success. This course engages the student in meaningful academic and non-academic in-and-out-of-classroom activities. It emphasizes critical thinking in the formation of academic and social goals and support groups, in self-management, and in study strategies.

Work or voluntary experience that closely relates to the major, equates with skills knowledge or perspectives currently required in course work and involves analysis or reflection at lower division or upper division undergraduate credit. Portfolio evaluated by faculty team. To apply for this credit, see the following link www.tntech.edu/ISEE/CreditForLifeExperience.pdf

Work or voluntary experience that closely relates to the major, equates with skills knowledge or perspectives currently required in course work and involves analysis or reflection at lower division or upper division undergraduate credit. Portfolio evaluated by faculty team. To apply for this credit, see the following link www.tntech.edu/ISEE/CreditForLifeExperience.pdf

Work or voluntary experience that closely relates to the major, equates with skills knowledge or perspectives currently required in course work and involves analysis or reflection at lower division or upper division undergraduate credit. Portfolio evaluated by faculty team. To apply for this credit, see the following link www.tntech.edu/ISEE/CreditForLifeExperience.pdf

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Work or voluntary experience that closely relates to the major, equates with skills knowledge or perspectives currently required in course work and involves analysis or reflection at lower division or upper division undergraduate credit. Portfolio evaluated by faculty team. To apply for this credit, see the following link www.tntech.edu/ISEE/CreditForLifeExperience.pdf

UNIV 4110. PRST/LIST Internship. Lec. 3-6. Credit 3-6.
Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee.

UNIV 4113. PRST/LIST Internship. Lec. 3. Credit 3.
Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee.

Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee.

UNIV 4115. PRST/LIST Internship. Lec. 5. Credit 5.
Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee.

Prerequisite: Permission of instructor. Educational activity within an organization dealing with the type of work the student hopes to do upon graduation. The internship is a learning environment where the student is treated as one of the employees but often does not have the pressures of being a full-time employee.

UNIV 4995. PRST/LIST Culminating Project. Lec. 3. Credit 3.
Prerequisite: Permission of instructor. Academic research or other creative activity resulting in a tangible product to demonstrate synthesis of student's coursework. This course is required for all PRST and LIST majors.

UNIV 4996. PRST/LIST Special Projects. Credit 4.
Web Design (WEBD)

WEBD 1500. Introduction to Web Design.  
Lec. 3. Credit 3. 
This course is an introduction to the internet and its function as well as a hands-on workshop on how to build a basic webpage.

WEBD 2300. Web Site Design: Dynamic Sites.  
Lec. 3. Credit 3. 
Prerequisite: WEBD 1500, CIW certification, evidence of having passed CIW, Exam ID0.410, or consent of the instructor. This course focuses on authoring sites, creating content, creating digital media, and effectively employing standards and technologies for effective site design.

WEBD (PC) 3500. Web Site Construction/The Rhetoric of Internet Publishing.  
Lec. 3. Credit 3. 
Prerequisite: ENGL 1020 Instruction in web site analysis and document design, including background in rhetorical theory and principles.

WEBD 4950. Advanced Web Page Design.  
Lec. 3. Credit 3. 
Prerequisite: WEBD 2300 The development of web pages as documents using advanced tools.

WEBD 4975. Seminar in Web Design.  
Lec. 3. Credit 3. 
Integrative course focusing on major concepts of Web Design.

WFS (BIOL) 2991-2994. Topics.  
Credit 1. 
Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four hours on a special topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS)299 Topics or BIOL (WFS) 499. (599.) Advanced Topics courses are earned.

WFS (BIOL) 3120. General Ecology.  
Lec. 3. Credit 3. 
The relationship between plants and animals and their environment. This course cannot be taken as part of the university science requirement, and credit will not be given for both BIOL/WFS 3120 and BIOL 3120/WFS 3130.

WFS (BIOL) 3130. General Ecology.  
Lec. 3. Lab. 3. Credit 4. 
The relationship between plants and animals and their environment. The laboratory provides examples of concepts discussed in lecture and analytical procedures used in interpreting data.

WFS (CJ) 3500. Wildlife Law Enforcement.  
Lec. 3. Credit 3. 
State wildlife laws and practices used in their enforcement.

WFS (BIOL) 4220 (5220). Biostatistics.  
Lec. 3. Credit 3. 
Probability and frequency distribution; statistical populations and samples; and tests of hypotheses used in biological research.

WFS (BIOL) 4230 (5230). Animal Behavior.  
Lec. 2. Lab. 3. Credit 3. 
Prerequisite: Junior standing. Introduction to basic principles underlying the behavior of animals.

WFS 4500 (5500). National Wildlife Policy.  
Lec. 3. Credit 3. 
Prerequisite: Eight semester hours of biology. Policies, agencies and laws that influence wildlife management on a national level.

WFS (BIOL) 4630 (5630). Ornithology.  
Lec. 2. Lab. 3. Credit 3. 
Prerequisite: Junior standing. General survey of the class Aves with emphasis on morphology, identification and ecology of local birds.

WFS 4640 (5640). Waterfowl Ecology and Management.  
Lec. 2. Lab. 3. Credit 3. 
Prerequisite: BIOL 3130 or WFS 3130 Advanced ecological principles as illustrated by ducks, geese, and swans, including habitat selection, morphological and behavioral adaptations, intraspecific and interspecific interactions, and reproductive ecology. Field techniques for identifying species and management approaches are emphasized in the laboratory.

WFS (BIOL) 4650 (5650). Marine Biology.  
Lec. 3. Lab. 2. Credit 4. 
Prerequisite: BIOL 3130 or WFS 3130 An introduction to the study of the marine environment and marine organisms.

Lec. 2. Lab. 3. Credit 3. 
Prerequisite: BIOL 3130 or WFS 3130 or concurrent enrollment. The ecology and natural history of selected avian species, emphasizing game species, endangered species, predators, and pests. Anatomy and procedures for identification are the focus of laboratories.

WFS 4670 (5670). Wild Mammal Ecology.  
Lec. 2. Lab. 2. Credit 3. 
Prerequisite: BIOL 3130 or WFS 3130 or concurrent enrollment. The natural history and ecology of selected mammal species, emphasizing game species, furbearers, endangered species, predators, and pests. Anatomy and procedures for identification are the focus of the laboratories.

WFS 4700 (5700). Habitat Management.  
Lec. 2. Lab. 3. Credit 3. 
Prerequisite: BIOL 3240. Description, principles and techniques of quantitative characterization of wildlife habitat types.

WFS 4710 (5710). Fisheries Management.  
Lec. 3. Lab. 3. Credit 4. 
Prerequisite: BIOL 3130 or WFS 3130. Theory, methods, and techniques of freshwater fisheries management. Field and laboratory.
WFS 4711 (5711). Fisheries Management.  
Lec. 3. Credit 3.  
Prerequisite: BIOL 3130 or WFS 3130. Classroom-based overview of theory, methods, and techniques of freshwater fisheries management.

WFS 4730 (5730). Conservation Biology.  
Lec. 3. Credit 3.  
Prerequisite: BIOL 3130 or WFS 3130. Advanced concepts of plant and animal conservation, including biodiversity, population genetics, habitat fragmentation, endangered and threatened species, and ecosystem management.

WFS 4740 (5740). Wildlife Principles.  
Lec. 2. Credit 2.  
Prerequisite: BIOL 3130 or WFS 3130. Classroom-based theory and principles of wildlife management.

WFS 4760 (5760). Fish Culture.  
Lec. 2. Lab. 4. Credit 4.  
Prerequisite: BIOL 3130 or WFS 3130. Cultural practices; hatchery operation, care of brood fish, transport and stocking; and the ecological requirements of hatchery species.

WFS 4790. Wildlife Techniques.--Summer.  
Prerequisite: WFS 4740 (5740). Field-based techniques for studying and managing wildlife populations.

WFS (BIOL) 4810 (5810). Ichthyology.  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: Junior standing. Identification, classification, anatomy, physiology, ecology and adaptations of fishes; emphasis on North American freshwater species.

WFS (BIOL) 4820 (5820). Mammalogy.  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: Junior standing. Classification, structure and function, phylogeny and geographical distribution of mammals; emphasis on Tennessee mammals.

WFS (BIOL) 4830 (5830). Herpetology.  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: Junior standing. Classification, adaptations, habits, life histories and geographical distribution of amphibians and reptiles; emphasis on North American species.

WFS (BIOL) 4840 (5840). Limnology.  
Lec. 2. Lab. 3. Credit 3.  
Prerequisite: Junior standing. Physiochemical and biological dynamics of inland waters.

WFS 4900. Internship in Wildlife and Fisheries Science.  
Credit 3.  
Prerequisite: Consent of instructor required. Students work with a public agency that is compatible with their interests. (May be taken twice if the assignments are with different agencies or different divisions within an agency.)

WFS (BIOL) 4991-4994 (5991). Advanced Topics.  
Credit 1-4.  
Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one, two, three, or four credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the department chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 299-Topics or BIOL (WFS) 499- (599.) Advanced Topics courses are earned.

Women and Gender Studies (WGS)

◆ WGS 2010. Introduction to Women and Gender Studies.  
Lec. 3. Credit 3.  
Examination of issues in women and gender studies from a social sciences perspective. This course is a requirement for the Women and Gender Studies minor.

◆ Meets Tennessee Technological University and Tennessee Board of Regents minimum degree requirements.
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Jordan, Patricia, Professor of Health and Physical Education. D.A., Middle Tennessee State University, 1997 (1997).

Jordan-Wagner, James, Dean, College of Business, Professor of Finance. Ph.D., University of North Texas, 1989 (2008).

Jung, Nakwon, Assistant Professor of English and Communications. Ph.D., University of Texas, 2010 (2010).


Keller, Sarah, Associate Professor of Curriculum and Instruction. Ed.D., University of Tennessee, 2004 (2005).


Killman, Christy, Assistant Professor of Exercise Science, Physical Education and Wellness. D.A., Middle Tennessee State University, 2002 (2007).


Laningham, Susan D., Associate Professor of History. Ph.D., University of Arkansas, 2001 (2002).


Lashley, Terry, Assistant Professor of Curriculum and Instruction. Ph.D., University of Tennessee, 2002 (2004).

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Layzer, James, Professor of Biology. Ph.D., Oklahoma State University, 1982 (1985).
Leimer, H. Wayne, Instructor, Academic Development Program.
Li, Ping-Chi, Professor of Biology. Ph.D., University of Iowa, 1992 (1999).
Liu, Jan Jane, Associate Professor of Civil Engineering. Ph.D., University of Hawaii, 2002 (2002).
Loskot, Donald, Assistant Professor of Psychology. Ed.D., University of San Francisco, 1993 (2007).
Loutzenheiser, Roy C., P.E., Associate Dean for Basic Engineering, Recruiting & Retention, College of Engineering; Professor of Civil Engineering. Ph.D., Texas A&M University, 1972 (1989).
Martin, James, Associate Professor of Curriculum and Instruction. Ed.D., University of Tennessee, 1995 (2003).

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McAldoo, Stephen, Professor of Health and Physical Education. B.S., Middle Tennessee State University, 1993 (1999).
McQuiston, Linda, Assistant Professor of Nursing. M.S.N., University of Phoenix, 2004 (2009).
McRae, William M., Professor of English. Ph.D., Purdue University, 1977 (1982).
Miller, Christine, Professor of Business Management. Ph.D., University of Houston, 1994 (1993).
Mohr, Benjamin, Associate Professor of Civil & Environmental Engineering. Ph.D., Georgia Institute of Technology, 2005 (2005).
Morgan, Shannon, Assistant Professor of Counseling and Psychology. Ph.D., Arizona State University, 2004 (2008).
Munukutla, Sastry, Director of Electric Power Center; Professor of Mechanical Engineering. Ph.D., University of Iowa, 1981 (1986).
Natarajan, Ramachandran, Professor of Decision Sciences, Mayberry Professor of Management. Ph.D., University of Kansas, 1984 (1988).
Norris, G. Lachelle, Associate Professor of Sociology. Ph.D., University of Tennessee, 1996 (2002).
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O'Rourke, Michael, Professor of English. M.A., University of Iowa, 1984 (1989).


Otuonye, Francis, Associate Vice President for Research and Graduate Studies; Professor of Civil Engineering. Ph.D., Ohio State University, 1981 (2001).


Pardue, Sally J., Associate Professor of Mechanical Engineering. Ph.D., Tennessee Technological University, 1995 (1999).


Pennycuff, Kristen, Assistant Professor of Curriculum and Instruction. Ph.D., University of Tennessee, 2003 (2005).

Pharr, Julie Moore, Professor of Marketing. Ph.D., Mississippi State University, 1987 (1987).


Pineda, Rodney C., Associate Professor of Business Management. Ph.D., Texas Tech University, 1994 (1993).


Propes, Charlotte, Assistant Professor of History. Ph.D., University of Mississippi, 2003 (2010).

Pulte, Diane, Associate Professor of Music. M.M., Southeastern Louisiana University, 1998 (2004).

Qiu, Robert, Professor of Electrical and Computer Engineering (Manufacturing Center). Ph.D., Polytechnic University, 1995 (2003).


Ramirez, Guillermo R., Associate Professor of Civil Engineering. Ph.D., Colorado State University, 1998 (2000).


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Rappi, Magdalena, Professor of Economics. Ph.D., University of South Carolina, 1985 (1985).

Raymondo, James, Professor of Sociology. Ph.D., University of Tennessee, Knoxville, 1983 (2007).


Reeves, Susan, Assistant Professor of Nursing. M.S.N., Vanderbilt University, 1997 (2004).


Rice-York, Cynthia, Assistant Professor of Chemical Engineering. Ph.D., University of Illinois at Urbana Champaign, 2000 (2008).

Richards, Stephanie, Assistant Professor of Curriculum and Instruction. Ph.D., University of Southern Mississippi, 2001 (2008).


Rogers, Michael, Associate Professor of Computer Science. Ph.D., University of Kentucky, 2002 (2002).


Russell, Bedelia, Assistant Professor of Nursing. M.S.N., Vanderbilt University, 2001 (2002).


Ryan, Edmond P., P.E., Associate Professor of Civil Engineering. Ph.D., University of New Mexico, 1974 (1978).


Seay, Robert, Associate Professor of Accounting. D.B.A., Mississippi State University, 1986 (2010).


Setliff, Deborah, Associate Professor of Curriculum and Instruction. Ph.D., Louisiana State University, 2001 (2002).
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Siraj, Ambareen, Assistant Professor of Computer Science. Ph.D., Mississippi State University, 2006 (2006).


Smith, David D., Associate Professor of Mathematics. Ph.D., University of Georgia, 2001 (2002).


Smith, Matthew, Associate Professor of Curriculum and Instruction. Ed.D., Vanderbilt University, 2003 (2005).


Smith, Sandra J.W., Associate Professor of Curriculum & Instruction. Ed.D., Vanderbilt University, 2001 (2002).


Stanger, Greta G., Director, Women's Center; Associate Professor of Sociology. Ph.D., The University of Tennessee, 1986 (1966-1969, 1971).

Stap, Frank W., Jr., Professor of Geology. Ph.D., Florida State University, 1973 (1985).


Stein, Barry S., Professor of Educational Psychology. Ph.D., Vanderbilt University, 1977 (1979).

Stephens, Mark A., Associate Vice President for Academic Affairs; Professor of Economics. Ph.D., The University of Tennessee, 1985 (1980).

Stepp, Julie, Assistant Professor of Curriculum and Instruction. Ph.D., Tennessee Technological University, 2008 (2008).

Stewart, Delane, Assistant Professor of Nursing. M.S.N., University of Mississippi, 1998 (2003).


Stretz, Holly, Assistant Professor of Chemical Engineering. Ph.D., University of Texas, 2005 (2005).

Sullivan, Judith, Assistant Professor of Music. Ph.D., University of Kentucky, 2004 (2007).


Suters, Leslie, Associate Professor of Curriculum and Instruction. Ph.D., University of Tennessee, 2004 (2004).


Swartling, Daniel J., Associate Professor of Chemistry. Ph.D., University of North Dakota, 1989 (1994).

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Talbert, Douglas, Associate Professor of Computer Science. Ph.D., Vanderbilt University, 2001 (2002).


Thompson, Sharon, Assistant Professor of Nursing. M.S.N., University of Phoenix, 2007 (2010).

Throckmorton, H. Bruce, Professor of Economics. Ph.D., University of Arkansas, 1972 (1971).


Timmerman, Thomas, Professor of Decision Sciences and Management. Ph.D., Tulane University, 1996 (2001).

Ting, Kwun-Lon, Professor of Mechanical Engineering (Manufacturing Center). Ph.D., Oklahoma State University, 1982 (1982).


Ventura, Carol A., Professor of Art. Ph.D., University of Georgia, 1989 (1994).

Vondra, L. Fred, Professor of Manufacturing and Industrial Technology. D.I.T., University of Northern Iowa, 1992 (1997).


Wang, Chunseng, Assistant Professor of Chemical Engineering (Manufacturing Center). Ph.D., Zhejiang University, 1995 (2003).

Watlington, Deborah, Assistant Professor of Curriculum and Instruction. Ph.D., Texas A & M University, 1999 (2000).


Wells, Martha, Professor of Chemistry (Water Center). Ph.D., Auburn University, 1981 (1989).

Wells, S. Michael, Assistant Professor of Basic Engineering. M.S., The University of Tennessee, 1980 (1980).

Wendt, Jeremy, Assistant Professor of Curriculum and Instruction. Ph.D., Tennessee State University, 2007 (2007).


Wilcox, Zachary, Associate Professor of Counseling and Psychology. Ph.D., The University of Tennessee, 2000 (2000).
Tennessee Technological University

Wilson, Brenda, Assistant Professor of Communication. Ph.D., Tennessee Technological University, 2007 (2001).
Wilson, Christopher D., Associate Professor of Mechanical Engineering. Ph.D., The University of Tennessee, 1997 (1997).
Yoon, Hwan-Sik, Assistant Professor of Mechanical Engineering. Ph.D., The Ohio State University, 2002 (2007).
Young, Jed, Assistant Professor of Agriculture. Ph.D., Purdue University, 2003 (2004).
Zagumny, Lisa, Associate Professor of Curriculum and Instruction. Ph.D., University of Tennessee, 2003 (2005).
Zamer, Craig, Assistant Professor and Director of Choral Activities. Ph.D., Florida State University, 2007 (2008).
Zhang, Hong, Associate Professor of Chemistry. Ph.D., University of Vermont, 1998 (2002).

LIBRARY FACULTY

Davis, Delia A., Assistant Professor. M.S., University of Tennessee, 2008 (2009).
Hajdik, David, Assistant Professor. M.S.I.S., University of Tennessee, 2006 (2007).

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ADJUNCT FACULTY

Booth, James R., Jr., P.E., Adjunct Associate Professor of Chemical Engineering. Ph.D., Clemson University, 1965 (1994).
Case, R. Alex, Adjunct Faculty of Nursing. M.D., University of Tennessee at Memphis, 1984.
Clough, John, Adjunct Faculty of Nursing. M.D., Loma Linda University, 1982.
Gray, James C., Adjunct Faculty of Nursing. M.D., Medical College of Georgia, 1976.
Hopper, Katherine, MS, MT (ASCP) Program Director, Medical Technology Program, Vanderbilt University Medical Center.
Laposata, Michael, M.D., Medical Director, Vanderbilt University Medical Center.
Lenhart, Michael B., Adjunct Faculty of Nursing. M.D., Medical College of Virginia, 1988.
Stewart, Colby, Adjunct Faculty of Nursing. M.D., American University in the Caribbean, 1992.
Stout, J. Bunker, Adjunct Faculty of Nursing. M.D., University of Tennessee, Memphis, 1984.
Stuber, Harry L., Jr., Adjunct Faculty of Nursing. M.D., University of Texas Medical School, 1972.
Tansil, Donald W., Adjunct Professor of Health and Physical Education. M.D., The University of Tennessee Medical School, 1966.
Wyatt, John, Adjunct Faculty of Nursing. M.D., University of South Alabama, 1983.

EMERITUS FACULTY

Ayers, Mary Nesbitt, Professor of Curriculum and Instruction, Emerita. Ed.D., University of Georgia, 1968 (1972-2004).
Banks, Thurston B., Associate Professor of Chemistry, Emeritus. Ph.D., University of Delaware, 1968 (1972-2009).
Barker, Marvin W., Provost and Vice President for Academic Affairs; Professor of Chemistry, Emeritus. Ph.D., Duke University, 1963 (1990-2007).
Tennessee Technological University


Briggs, Robert C., III, Associate Dean, College of Arts and Sciences; Professor of Mathematics, Emeritus. Ph.D., University of Houston, 1968 (1968-2001).


Bustamante, Rafael B., P.E., Professor of Civil Engineering, Emeritus. Ph.D., Oklahoma State University 1968 (1967-1994).


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Evans, Eston E., Professor of German and ESL, Emeritus. Ph.D., University of Texas, 1975 (1977-2004).


Floyd, Joe M., Assistant Professor of Industrial Technology, Emeritus. M.S., Oklahoma State University, 1956 (1966-1995).

Folio, Mary Rhonda, Professor of Curriculum and Instruction, Emerita. Ed.D., George Peabody College of Vanderbilt University, 1975 (1975-2010).


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Goodwin, William A., P.E., Associate Vice President for Research and Professor of Civil Engineering, Emeritus. M.S., University of Kentucky, 1951 (1979-1994).


Jones, Christine Spivey, Associate Professor, Emerita. B.L.S., George Peabody College for Teachers, 1948 (1948-2007).


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King, George, Assistant Professor of English, Emeritus. M.A., Vanderbilt University, 1947 (1965-1982).


Lane, Harry F., Assistant Professor of Geography, Emeritus. M.A., University of Georgia, 1963 (1964-1998).

Leddy, Glenn L., Assistant Professor of Industrial Technology, Emeritus. M.A.T., Middle Tennessee State University, 1972 (1968-1994).


McGee, Leo, Associate Vice President for Academic Affairs; Professor of Instructional Leadership, Emeritus. Ph.D., Ohio State University, 1972 (1977-2007).
Tennessee Technological University


Phelps, Margaret S., Director of Rural Education; Professor of Curriculum and Instruction, Emerita. Ed.D., The University of Tennessee, 1975 (1975-2009).

Plummer, Virginia Wyatt, Associate Professor of Office Administration, Emerita. M.S., The University of Tennessee, 1941 (1945-1982).


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Stapor, Frank W., Jr., Professor of Earth Sciences, Emeritus. Ph.D., Florida State University, 1973 (1985-2010).

Stearman, Gail W., Assistant Professor of Nursing, Emerita. M.S.N., The University of Tennessee, 1986 (1990-2008).
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Tidwell, Marvin, Associate Professor of Physics, Emeritus. B.S., Emory University, 1948 (1955-1988).

Tolbert, R. Noel, P.E., Professor of Civil Engineering, Emeritus. Ph.D., Vanderbilt University, 1975 (1979-2007).

Tolbert, Rebecca P., Associate Vice President for Academic Affairs and Enrollment Management; Associate Professor of Nursing, Emerita. M.N.Sc., University of Arkansas, 1973 (1980-2006).


University Committees

(The President is a member, ex-officio, of all committees. The Academic Council and the Administrative Council meeting in joint session constitute the University Assembly for Tennessee Technological University).

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Administrative Council
Admissions and Credits
Athletics
Buildings and Grounds
Campus Recreation
Campus Space Utilization and Allocation
Care and Use of Laboratory Animals in Experimentation
Chapter 606 Student Monies Allocation
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