**DEPARTMENT OF NUTRITION**

http://nutrition.utk.edu

**Professors**

Burney, J., PhD ........................................ Tennessee
Erwin, P.C., MD ........................................ Alabama (Birmingham)
MHP ........................................................ Johns Hopkins
Grier, B., PhD ............................................. Tennessee
Haughton, B., EdD ......................................... Columbia
Karlstad, M., PhD ......................................... Loyola
Whelan, J., PhD ............................................ Penn State
Zemel, M., PhD .............................................. Wisconsin

**Associate Professor**

Kim, J., PhD ................................................ Tennessee

**Assistant Professors**

Bitte, J., PhD ................................................ Tennessee
Chen, G., PhD ............................................. University of Texas Southwestern Medical Center (Dallas)
Hansen-Petrik, M., PhD ................................ Tennessee
Jahns, L., PhD ............................................... North Carolina
Kavanagh-Prochaska, K., PhD ......................... California
Raynor, H., PhD ............................................ State University of New York (Buffalo)
Spence, M., PhD .............................................. Tennessee

**Lecturer**

Weisweiler, K., MS ........................................ Boston

**Emeriti Faculty**

Sachan, D., PhD ........................................... Illinois
Skinner, J., PhD ............................................ Oregon State

The Department of Nutrition promotes an understanding of nutrition for the enhancement of the physiological and social well-being of individuals and families across the lifespan through teaching, research and service. Students learn about nutritional needs from the smallest unit of the cell to the individual’s needs throughout the lifecycle; the ways that attitudes and beliefs influence food patterns; the management of resources in food service and the properties of foods. Thus, departmental programs service society through graduates who are able to interpret and contribute to social needs in regard to nutrition and wellness, both as professionals and as responsible citizens.

The professional discipline of nutrition is rooted firmly in general education and provides a clearly defined base of professional knowledge. The foundation for the major includes basic sciences, i.e., chemistry, microbiology, physiology, and psychology. The natural sciences provide a base for understanding nutrient functions in the body and the social sciences to better understand cultural aspects of food and food related consumer needs. In addition, students with a strong research interest may prepare for research-oriented careers in laboratories or as graduate students in nutrition or other biomedical disciplines.

**NUTRITION MAJOR**

This major is designed for students interested in basic and applied sciences. Students are expected to acquire advanced education in chemistry. The Bachelor of Science in Health and Human Sciences with a major in nutrition is currently granted approval status by the Commission of Accreditation/Approval for Dietetic Education of the American Dietetic Association, 120 S Riverside Plaza, Chicago, Illinois 60606-6995, (312) 899-0040, http://www.eatright.org/cade. These requirements are regarded as the basic education component for the preparation of persons entering the dietetic profession. The generalist emphasis of this program prepares individuals to enter the dietetic profession in general dietetics and includes nutrition, foodservice systems management, management theory and principles and communication sciences including computer and statistical applications. Graduates are prepared to enter accredited dietetic internships. An internship experience completes academic and practice requirements for eligibility as a member of The American Dietetic Association and qualifies the graduate to apply for the Registration Examination to become a Registered Dietitian (RD).
Students may receive more information from the department about RD requirements. RDs work as members of health care teams in acute care hospitals and community-based settings, home health care programs, college and university foodservice facilities, wellness clinics and private practice. Extension Service and food companies are also avenues of employment.

**Requirements for the Bachelor of Science in Health and Human Sciences • Nutrition Major**

**First Year**
- Chemistry 120, 130* ........................................................................ 8
- English 101*, 102* ........................................................................ 6
- Mathematics 119 and 125* ............................................................... 6
- Psychology 110 ............................................................................... 3
- Nutrition 100* ............................................................................... 3
- Social Sciences Elective* ................................................................ 3

**Second Year**
- English 101*, 102* ........................................................................ 6
- Mathematics 125 .......................................................................... 3
- Biochemistry and Cellular and Molecular Biology 230 ................. 3
- Microbiology 210* ........................................................................ 3

**Third Year**
- Accounting 200 ........................................................................... 3
- Cultures and Civilizations Elective* ................................................ 3
- Arts and Humanities Elective* ....................................................... 3
- Nutrition 310, 313, 314 ................................................................. 10
- Communication Studies 240* ....................................................... 3
- Microbiology 210* ........................................................................ 3

**Fourth Year**
- Electives ......................................................................................... 6
- Hotel, Restaurant and Tourism 341 .............................................. 3
- Classics 273 ................................................................................ 3
- Arts and Humanities Elective* ....................................................... 3
- Nutrition 303, 410, 412*, 415, 416, 420 ..................................... 17

* Meets University General Education Requirement.
1 If a student successfully completes the proficiency exam for Math 119, those credit hours must be replaced with additional elective credit hours.

**Minor in Nutrition**

**Required Courses**
- Nutrition 100, 302, 310, 313, 314 .................................................. 16

Total 120

NOTE: All course prerequisites are required. A student must earn a grade of C or better in each course to successfully complete the requirements for this minor.

**DEPARTMENT OF RETAIL, HOSPITALITY, AND TOURISM MANAGEMENT**

http://rhtm.utk.edu
Nancy J. Rutherford, Head

**Professors**
- Costello, C., PhD ................................................................. Tennessee
- Fairhurst, A., PhD .............................................................. Oklahoma State
- Kim, Y., PhD ........................................................................... North Carolina
- Rutherford, N., PhD .............................................................. North Carolina State

**Associate Professors**
- Chen, R., PhD ................................................................. North Carolina State
- Morse, Steve, PhD ............................................................. Tennessee
- Wise, D., PhD ........................................................................ Texas A&M

**Assistant Professors**
- Antun, J., PhD ................................................................. South Carolina
- Costen, W., PhD .............................................................. Washington State
- Lim, H., PhD ........................................................................... Purdue

**Internship Coordinators**
- Aaser, D., MS ................................................................. Wisconsin (Stout)
- Simpson, L., MS .............................................................. Tennessee

**Executive-in-Residence**
- Piper, C., BA ................................................................. Maryville College

The mission of the Department of Retail, Hospitality, and Tourism Management is to provide nationally and internationally recognized interdisciplinary programs that prepare professionals and serve organizations in the public and private sectors through teaching, research, and technology transfer.

**HOTEL, RESTAURANT, AND TOURISM MAJOR**

The hotel, restaurant, and tourism major focuses on meeting the mid- and upper-level management needs of the food and lodging industry. It is a program that assists students in getting the breadth of knowledge, responsibility and creativity to meet the changing environment of complex management problems in industry. A business minor is built into the degree requirements.

The major requires extensive field experience. The curriculum provides a strong base in management and practical application of these skills. The general education electives help students to sharpen their analytical, conceptual, and communications abilities. Graduates may start as management trainees in restaurants, foodservice, hotels, support industries, or in tourism operations with subsequent upward mobility into management positions.

**Progression Requirements**

Students should apply for progression into the major after completing at least three of the following Hotel, Restaurant, and Tourism 210, 211, 212, and 224 and prior to entering Hotel, Restaurant, and Tourism 390. Applications for progression are available in the department office.

For progression into the major, students must meet the following criteria.

- Cumulative grade point average 2.30 or greater for at least 30 semester hours completed.
- Grade of C or better in all hotel, restaurant, and tourism prefix courses.
- Successful completion of English 101, 102, and Mathematics 125.
- Complete 300 post-secondary school hours of industry related work for the chosen major. A complete list of appropriate work experiences is available in the department office.

For graduation, students must earn a grade of C or better in all hotel, restaurant, and tourism courses.

**Requirements for the Bachelor of Science in Service Management • Hotel, Restaurant, and Tourism Major**

**First Year**
- English 101*, 102* ........................................................................ 6
- Natural Sciences Electives* .......................................................... 7-8
- Mathematics 119 or 123* and 125* ............................................. 6
- Arts and Humanities Electives* .................................................... 6
- Cultures and Civilizations Elective* ............................................. 3

**Second Year**
- Accounting 200 ........................................................................... 3
- Statistics 201* ............................................................................. 3
- Economics 201* .......................................................................... 4
- Social Sciences Elective* ............................................................. 3

**Business Administration 201** ...................................................... 4
- Hotel, Restaurant, and Tourism 210 .......................................... 3
- Hotel, Restaurant, and Tourism 211 .......................................... 3
Hotel, Restaurant, and Tourism 224 ........................................... 3  
Hotel, Restaurant, and Tourism 311 ........................................... 3  
Hotel, Restaurant, and Tourism 212 ........................................... 3  

Third Year  
2Marketing 300 ................................................................. 3  
Communication Studies 240* ................................................. 3  
Cultures and Civilizations Elective* ........................................... 3  
Retail and Consumer Sciences 341 ........................................... 3  
Hotel, Restaurant, and Tourism 326 ........................................... 3  
Hotel, Restaurant, and Tourism 360 ........................................... 3  
1Hotel, Restaurant, and Tourism Elective .................................... 3  
Hotel, Restaurant, and Tourism 390* ........................................... 3  
Hotel, Restaurant, and Tourism 392 ........................................... 3  
Elective ................................................................................. 3  

Fourth Year  
2Management 300 ................................................................... 3  
Finance 301 ........................................................................... 3  
Hotel, Restaurant, and Tourism 410 ........................................... 4  
Hotel, Restaurant, and Tourism 425 ........................................... 3  
Hotel, Restaurant, and Tourism Electives ..................................... 6  
1Hotel, Restaurant, and Tourism 492 or Hotel, Restaurant, and Tourism Elective .................................................. 6  
Elective ................................................................................. 6  

Total 121-122  
* Meets University General Education Requirement.  
Students must meet the General Education Requirement for Communicating through Writing by selecting a course with a (WC) designation. This course may be in the major or from another discipline.  
1 Choose from 101, 341, 423, 435, 440, 445, 450, 484.  
2 Business administration minor requirement.

MINORS

Minor in Restaurant and Foodservice Management  
Required Courses  
Hotel, Restaurant and Tourism 101, 210, 311, 326, 341, 445  ............... 15  

Minor in Tourism and Hospitality Management  
Required Courses  
Hotel, Restaurant and Tourism 210, 211, 224 ......................................... 9  
Select two from Hotel, Restaurant, and Tourism 311, 423, 435, 450 . . . 6  
Total 15

RETAIL AND CONSUMER SCIENCES MAJOR  
Through a combination of classroom instruction and field-based experience, students prepare for entry-level positions in diverse occupations and for advanced education. The retail and consumer sciences major is one of the largest programs of this type in the southeast. Retailing is one of the fastest growing segments of our economy, and opportunities for employment will continue to be excellent through the 21st century.

Retail and consumer sciences provides students with knowledge of the retailing industry and the principles and theories involved in managing personnel and merchandising goods for the consumer. A business minor is built into the degree requirements. The progressive direction that this program takes provides graduates with excellent management opportunities in the retail sector.

This program requires field study experiences where students are guided by faculty in the selection of locations for on-the-job experiences related to their career area as a part of their educational program. Professional contacts made in field study experiences often lead to opportunities for career placement upon graduation.

Progression Requirements  
Students should apply for progression into the major after completing Retail and Consumer Sciences 210, and prior to entering Retail and Consumer Sciences 390. Applications for progression are available in the department office. For progression into the major, students must meet the following criteria:

- Cumulative grade point average 2.30 or greater with a minimum of 30 semester hours completed.
- Grade of C or better in all retail and consumer sciences prefix courses.
- Completion of English 101, 102, and Mathematics 125.
- Complete 300 post-secondary school hours of industry related work for the chosen major. A list of appropriate work experiences is available in the department office.

For graduation, students must earn a grade of C or better in all retail and consumer sciences courses.

Requirements for the Bachelor of Science in Service Management • Retail and Consumer Sciences Major  
First Year  
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
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<tbody>
<tr>
<td>English 101*, 102*</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Natural Sciences Electives*</td>
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<td>7.8</td>
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<tr>
<td>Mathematics 119 or 123*, and 125*</td>
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<td>6</td>
</tr>
<tr>
<td>Arts and Humanities Electives*</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Cultures and Civilizations Elective*</td>
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<td>3</td>
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<tr>
<td>Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total 15</td>
<td></td>
<td>15</td>
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</tbody>
</table>

Second Year  
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Administration 201</td>
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<td>4</td>
</tr>
<tr>
<td>Retail and Consumer Sciences 210, 341</td>
<td></td>
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<td>3</td>
</tr>
<tr>
<td>Total 15</td>
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<td>15</td>
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</table>

Third Year  
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing 300</td>
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<td>3</td>
</tr>
<tr>
<td>Management 300</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Communication Studies 240*</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Retail and Consumer Sciences 310, 311, 346, 376, 390*</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Retail and Consumer Sciences 422</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Total 121-122</td>
<td></td>
<td>121-122</td>
</tr>
</tbody>
</table>

* Meets University General Education Requirement.  
1 Select 12 hours from Retail and Consumer Sciences 320, 411, 412, 415, 421, 480, 482, 484, 493, 495, 497; Hotel, Restaurant, and Tourism 425; Materials Science and Engineering 220.

Minor in Retail and Consumer Sciences  
Required Courses  
Retail and Consumer Sciences 210, 341 ........................................... 6  
Select 3 from Retail and Consumer Sciences 310, 346, 376, 412, 415, 421, 480 ........................................... 9  
Total 15
Susan M. Benner, Head

**Professors**
- Allington, R., PhD ........................................ Michigan State
- Benner, S., EdD ............................................ Columbia
- Brewer, E., EdD ........................................... Tennessee
- Davis-Wiley, P., EdD ....................................... Houston
- Hatch, J., PhD .......................................... Florida
- Long, V. (Associate Dean), EdD ......................... Missouri
- McMillan, F., EdD ........................................... State University of New York (Albany)
- Rider, R. (Dean), PhD ................................ North Carolina
- Rowell, C., EdD ........................................... George Peabody
- Turner, T., EdD ........................................... Penn State
- Ubben, G., PhD ............................................. Minnesota

**Associate Professors**
- Anfara, V., PhD ........................................ New Orleans
- Barclay-McLaughlin, M., PhD ........................... Michigan
- Bell, S., PhD ................................................ Tennessee
- Cagle, L. (Associate Dean), EdD ......................... Georgia
- Davis, J., PhD ............................................. New Mexico
- Gilrane, C., PhD ........................................... Illinois
- Melear, C., PhD ........................................... Ohio State

**Assistant Professors**
- Angelle, P., PhD ........................................ Louisiana State
- Botzakis, S., PhD ......................................... Georgia
- Broemmel, A., PhD ...................................... Southern Illinois
- Brown, C., EdD ......................................... George Washington
- Cady, J., PhD .............................................. Illinois State
- Cihak, D., PhD ........................................... Georgia State
- Groenke, S., PhD ......................................... Virginia Tech
- Hagevick, R., PhD ....................................... North Carolina State
- Hendricks, D., PhD .................................... Alabama
- Hodge, L., PhD ........................................... Vanderbilt
- Patterson, F., EdD ....................................... Tennessee
- Rearden, K., PhD ........................................ Texas A&M
- Stairs, A., PhD ............................................ Boston College
- Woolsey, L., PhD ...................................... Virginia Tech
- Wooten, D., PhD ......................................... New York

**ART EDUCATION MAJOR**

Students seeking licensure to teach art in the schools pursue the Bachelor of Fine Arts degree with a major in studio art or the Bachelor of Arts Degree with a major in studio art in the College of Arts and Sciences and will complete a major in art education at the undergraduate level. The undergraduate major in art education includes the following.

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Education 301</td>
<td>3</td>
</tr>
<tr>
<td>Art Education 302</td>
<td>3</td>
</tr>
<tr>
<td>Art Education 303</td>
<td>3</td>
</tr>
<tr>
<td>Art Education 350</td>
<td>3</td>
</tr>
<tr>
<td>Educational Psychology 210</td>
<td>3</td>
</tr>
<tr>
<td>Educational Psychology 401</td>
<td>3</td>
</tr>
<tr>
<td>Special Education 402</td>
<td>3</td>
</tr>
<tr>
<td>Instructional Technology 486</td>
<td>3</td>
</tr>
</tbody>
</table>

**Undergraduate Total 25**

The following courses are taken during the post-baccalaureate professional year. Students must apply to and be admitted by the Office of Graduate and International Admissions prior to registration.

**Hours Credit**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td>Education 574</td>
<td>2</td>
</tr>
<tr>
<td>Education 575</td>
<td>12</td>
</tr>
<tr>
<td>Education 591</td>
<td>4</td>
</tr>
<tr>
<td>Art Education 530</td>
<td>3</td>
</tr>
<tr>
<td>Art Education 540</td>
<td>3</td>
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</tbody>
</table>

**Graduate Total 24**

**NOTE:** Teacher licensure is granted at the successful completion of the professional year; 12 additional hours may be taken to complete the master's degree. For details, see the Graduate Catalog.

**SPECIAL EDUCATION MAJOR**

**Requirements for the Bachelor of Science in Education**

- **Special Education Major • Educational Interpreting Concentration**

  **First Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 101*, 102*</td>
<td>6</td>
</tr>
<tr>
<td>Arts and Humanities Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Social Sciences Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting Elective</td>
<td>7-8</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Physical Education Activity or Recreation Therapy Elective</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Reasoning Electives*</td>
<td>6</td>
</tr>
</tbody>
</table>

  **Second Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Studies 210* or 240*</td>
<td>3</td>
</tr>
<tr>
<td>Communicating through Writing (WC) Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>History 241*, 242*</td>
<td>6</td>
</tr>
<tr>
<td>Arts and Humanities Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Social Sciences Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting 223 and 226</td>
<td>6</td>
</tr>
</tbody>
</table>

  **Third Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Technology 486</td>
<td>3</td>
</tr>
<tr>
<td>Philosophy 340*</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting 210</td>
<td>3</td>
</tr>
<tr>
<td>Psychology 300*</td>
<td>3</td>
</tr>
<tr>
<td>Educational Psychology 401</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting 431, 432</td>
<td>6</td>
</tr>
<tr>
<td>Educational Interpreting 335</td>
<td>3</td>
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<tr>
<td>Educational Interpreting 340</td>
<td>3</td>
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<tr>
<td>Educational Interpreting 350</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting 355</td>
<td>3</td>
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</tbody>
</table>

  **Fourth Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education of the Deaf/Hard of Hearing 415, 416, 425</td>
<td>9</td>
</tr>
<tr>
<td>Educational Interpreting 345</td>
<td>3</td>
</tr>
<tr>
<td>Special Education 402</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting 435</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting 440</td>
<td>3</td>
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</tbody>
</table>

  **Total 121-122**

* Meets University General Education Requirement.

**NOTE:** Progression to the educational interpreting concentration requires a 2.70 cumulative GPA after a minimum of 30 semester hours of coursework and completion of Educational Interpreting 223 and 226 with a grade of B or better in both courses. A Board of Admissions will meet once a year to review applications and conduct interviews with each applicant. Students admitted to the program must maintain a minimum cumulative GPA of 2.70 while in the program. Students with less than a 2.70 GPA for two consecutive semesters will be dropped from the program. Students who fail to meet the standards for professional conduct during the course of their fieldwork will not be retained in the major.

**Requirements for the Bachelor of Science in Education**

- **Special Education Major • Education of the Deaf and Hard of Hearing Concentration**

  **First Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 101*, 102*</td>
<td>6</td>
</tr>
<tr>
<td>Arts and Humanities Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Anthropology 130*</td>
<td>3</td>
</tr>
<tr>
<td>Cultural and Civilizations Electives*</td>
<td>3-4</td>
</tr>
<tr>
<td>Educational Interpreting*</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics 113*-115* or 123*-125*</td>
<td>6</td>
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</tbody>
</table>

  **Second Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Studies 210* or 240*</td>
<td>3</td>
</tr>
<tr>
<td>Literature Elective</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting 223</td>
<td>3</td>
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<tr>
<td>Educational Interpreting 223</td>
<td>3</td>
</tr>
<tr>
<td>Educational Interpreting 226</td>
<td>3</td>
</tr>
<tr>
<td>Biological Science Elective</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total 121-122**

* Meets University General Education Requirement.

**NOTE:** Progression to the educational interpreting concentration requires a 2.70 cumulative GPA after a minimum of 30 semester hours of coursework and completion of Educational Interpreting 223 and 226 with a grade of B or better in both courses. A Board of Admissions will meet once a year to review applications and conduct interviews with each applicant. Students admitted to the program must maintain a minimum cumulative GPA of 2.70 while in the program. Students with less than a 2.70 GPA for two consecutive semesters will be dropped from the program. Students who fail to meet the standards for professional conduct during the course of their fieldwork will not be retained in the major.
**Requirements for the Bachelor of Science in Education**

- **Special Education Major** • Modified and Comprehensive Special Education Concentration (with Optional Endorsements in Early Childhood Special Education and Elementary Education)

**First Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education 574</td>
<td>2</td>
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<tr>
<td>Education 575</td>
<td>12</td>
</tr>
<tr>
<td>Education 591</td>
<td>4</td>
</tr>
<tr>
<td>Education of the Deaf/Hard of Hearing 528, 529</td>
<td>6</td>
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**Second Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
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<tbody>
<tr>
<td>Philosophy 246*(AH) (WC) Communication 210* or 240* or Communicating Orally (OC)</td>
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<tr>
<td>General Education Elective*</td>
<td>3</td>
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<tr>
<td>Educational Psychology 210</td>
<td>3</td>
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<tr>
<td>Non-US History</td>
<td>6</td>
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<tr>
<td>Geography Elective</td>
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<tr>
<td>1Biological Science Electives*</td>
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<tr>
<td>2Foreign Language*</td>
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**Third Year**

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Arts and Humanities*</td>
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</tr>
<tr>
<td>Economics Elective</td>
<td>3</td>
</tr>
<tr>
<td>Child and Family Studies 211</td>
<td>3</td>
</tr>
<tr>
<td>Information Science 330</td>
<td>3</td>
</tr>
<tr>
<td>Educational Psychology 320</td>
<td>3</td>
</tr>
<tr>
<td>Recreation and Leisure Studies 425</td>
<td>3</td>
</tr>
<tr>
<td>Educational Psychology 401</td>
<td>3</td>
</tr>
<tr>
<td>3Elementary Education 422</td>
<td>6</td>
</tr>
<tr>
<td>3Reading Education 430</td>
<td>2</td>
</tr>
<tr>
<td>4Special Education 410</td>
<td>3</td>
</tr>
</tbody>
</table>

**Fourth Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Education 402</td>
<td>3</td>
</tr>
<tr>
<td>Special Education 419</td>
<td>6</td>
</tr>
<tr>
<td>Special Education 420</td>
<td>3</td>
</tr>
<tr>
<td>Education 591</td>
<td>4</td>
</tr>
</tbody>
</table>

**Graduate Total 24**

1 * A physical or biological science course to complete science sequence
2 * Any course with a (WC) designation satisfies this requirement.

Students who are earning a baccalaureate degree in the College of Arts and Sciences and who are also seeking teacher licensure in elementary education, English as a Second Language, English education, foreign language education, mathematics education, music education, science education, social science education, are urged to earn a minor in elementary, English language learning, middle grades, or secondary education. Students who do not earn a minor as a part of their undergraduate studies will be required to complete the equivalent of a minor as a prerequisite to entering the fifth year of professional study.

Students should note that courses taken to satisfy the minor will not fulfill teacher licensure requirements.

**Teaching Minors**

Students interested in becoming elementary school teachers (K-grade 6) earn a Bachelor of Art or a Bachelor of Science in the College of Arts and Sciences. While completing requirements for the baccalaureate degree, students are encouraged to complete a minor in elementary education.

**Minor in Elementary Education**

Students who are earning a baccalaureate degree in the College of Arts and Sciences and who are also seeking teacher licensure in elementary education, English as a Second Language, English education, foreign language education, mathematics education, music education, science education, social science education, are urged to earn a minor in elementary education. Students who do not earn a minor as a part of their undergraduate studies will be required to complete the equivalent of a minor as a prerequisite to entering the fifth year of professional study.

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Psychology 210</td>
<td>3</td>
</tr>
<tr>
<td>Information Sciences 330</td>
<td>3</td>
</tr>
<tr>
<td>Reading Education 430</td>
<td>2</td>
</tr>
<tr>
<td>Instructional Technology 486</td>
<td>3</td>
</tr>
<tr>
<td>Educational Psychology 401</td>
<td>3</td>
</tr>
<tr>
<td>Special Education 402</td>
<td>3</td>
</tr>
<tr>
<td>Elementary Education 351</td>
<td>2</td>
</tr>
<tr>
<td>Elementary Education 422</td>
<td>6</td>
</tr>
</tbody>
</table>

**Undergraduate Total 25**
Minor in English Language Learning

Students interested in becoming PreK-12 English as a Second Language teachers typically earn a Bachelor of Arts degree in the College of Arts and Sciences with a major in English, linguistics, or a world language (i.e., Asian Studies, French, German, Spanish). As part of their degree, they should take English 477 or 372; English 471 (Sociolinguistics) is highly recommended. While completing requirements for the baccalaureate degree, students are encouraged to matriculate a minor in English language learning.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Psychology 210</td>
<td>3</td>
</tr>
<tr>
<td>Theory and Practice in Teacher Education 203</td>
<td>1</td>
</tr>
<tr>
<td>Foreign Language/ESL Education 466</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Language/ESL Education 476</td>
<td>3</td>
</tr>
<tr>
<td>Educational Psychology 401</td>
<td>3</td>
</tr>
<tr>
<td>Special Education 402</td>
<td>3</td>
</tr>
<tr>
<td>Instructional Technology 486</td>
<td>3</td>
</tr>
</tbody>
</table>

Graduate Total 24

The following courses are taken during the post-baccalaureate professional year. Students must apply to and be admitted by the Graduate School prior to registration.

Hours Credit

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education 574</td>
<td>2</td>
</tr>
<tr>
<td>Education 575</td>
<td>12</td>
</tr>
<tr>
<td>Education 591</td>
<td>4</td>
</tr>
<tr>
<td>Elementary Education 505</td>
<td>6</td>
</tr>
</tbody>
</table>

Graduate Total 24

Minor in Middle Grades Education

Students interested in becoming middle school teachers (grades 4-8) earn a BA or BS in the College of Arts and Sciences in either mathematics, English, an area of science (e.g., astronomy, biology, chemistry, geology, physical geography, physics, environmental science) or one of the social sciences (e.g., history, geography, political science, anthropology, sociology, economics). Students who have pursued programs in engineering or forestry may have coursework that may count in this area.

Students also complete a minor in middle grades education which consists of a minimum of 12 credit hours in one of the other four content areas: mathematics, science, social science, or English, as well as the professional education core courses (6 hours) as outlined below. Contact advisors in the college’s Student Services Center, A332 Jane and David Bailey Education Complex, for more information about specific requirements. The coursework listed below leads to middle grades licensure.

The following courses are taken during the post-baccalaureate professional year. Students must apply to and be admitted by the Office of Graduate and International Admissions prior to registration.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Psychology 210</td>
<td>3</td>
</tr>
<tr>
<td>Theory and Practice in Teacher Education 352</td>
<td>1</td>
</tr>
<tr>
<td>Theory and Practice in Teacher Education 355</td>
<td>3</td>
</tr>
<tr>
<td>Educational Psychology 401</td>
<td>3</td>
</tr>
<tr>
<td>Special Education 402</td>
<td>3</td>
</tr>
<tr>
<td>Instructional Technology 486</td>
<td>3</td>
</tr>
</tbody>
</table>

Graduate Total 24

NOTE: Teacher licensure is granted at the successful completion of the Professional Year; 12 additional hours may be taken to complete the master’s degree. For details, see the Graduate Catalog.
Engineers solve problems. To do so, they apply science, mathematics, and creativity to invent, design, test, build, and operate engineering systems that will meet the needs of society. In the latter half of the 20th century, engineers developed the personal computer, the space shuttle, artificial hearts, and many other “high-tech” products. The opportunities to use technology for the benefit of 21st century society will be even greater.

Engineers use the same problem-solving strategies whether designing a bridge, trouble shooting a computer chip problem, or developing a more efficient automobile engine. This commonality of approach makes it easy for an engineer to move from one specialization to another. The engineer’s can-do, problem solving outlook is also good preparation for management, and many engineers follow this career path.

Increasingly, engineers must also have good interpersonal skills to work effectively in the interdisciplinary groups required to tackle modern engineering projects. They must understand the ethical, environmental, social, political, and business implications of their work. Engineers must work comfortably among the cultures, customs, and languages of multi-national enterprises.

In light of modern society’s ever-increasing dependence on technology, there is a continuing and urgent need for engineering graduates who possess the high levels of technical competence and social understanding that will enable them to fulfill their responsibilities as professional engineers. The College of Engineering prepares men and women to face these challenges and to seize opportunities to become the technology leaders of the 21st century.

Graduates of the Bachelor of Science curricula offered by the college may enter directly into a position in industry, government, or private practice, or may pursue advanced study in graduate school. Their professional activities include research, development, design, operations analysis, construction, production supervision, and technical sales. Many practice their profession in Tennessee; but engineering knows no geographical bounds, and graduates of the college serve throughout the nation and in other countries as well.

The college offers twelve undergraduate majors – aerospace engineering, biomedical engineering, chemical engineering, civil engineering, computer engineering, computer science, electrical engineering, engineering physics, industrial engineering, materials science and engineering, mechanical engineering, and nuclear engineering.

Biosystems engineering is based in the College of Agricultural Sciences and Natural Resources with facilities located on the Agricultural Campus. The biosystems engineering curriculum is offered cooperatively by the College of Agricultural Sciences and Natural Resources and the College of Engineering. Details of the curriculum may be found in the College of Agricultural Sciences and Natural Resources section of this catalog.

The college, in cooperation with industrial sponsors, established the Minority Engineering Scholarship Program in 1973 and in 1999 renamed it the Diversity Engineering Scholarship Program. The program’s goal is to increase significantly the number of qualified minority engineering graduates. This program is maintained in the Office of Professional Practice.

College Admission Requirements

The College of Engineering has established admissions criteria for incoming freshmen based on several performance criteria, including completion of core academic subjects, GPA scores on these subjects and standardized test (SAT or ACT) scores. In addition to these requirements, a Success Prediction Indicator (SPI) number is used for admission to the College of Engineering. The SPI is calculated by adding an individual’s ACT mathematics score to 10 times their core high school GPA (based on a 4.0 scale). For information on what constitutes core high school courses, please consult the admission website http://admissions.utk.edu/undergraduate/apply/requirements.shtml.

The following table indicates the minimum required SPI for the corresponding academic year:

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Minimum SPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-09</td>
<td>58</td>
</tr>
<tr>
<td>2009-10</td>
<td>59</td>
</tr>
<tr>
<td>2010-11</td>
<td>60</td>
</tr>
</tbody>
</table>

SPI EXAMPLE: A student with a high school core GPA of 3.5 and an ACT mathematics score of 28 would have an SPI of 63 using the formula \(3.5 \times 10 + 28 = 63\). SAT scores are converted to an equivalent ACT score to perform this calculation.

Students who wish to pursue a degree in the College of Engineering at the University of Tennessee, Knoxville, but do not meet the SPI criterion may enroll as University Undecided students and complete appropriate mathematics, science, and other courses before applying for admission to the College of Engineering.
Facilities
Most of the college’s facilities are on the southeastern corner of
“The Hill.” Administration and Civil and Environmental Engineering
are in Perkins Hall; Electrical and Computer Engineering are in
Ferris Hall; Industrial and Information Engineering and the
Interdisciplinary Engineering Research Centers are in East
Stadium Hall; Nuclear Engineering is in the Pasqua Engineering
Building; Mechanical, Aerospace, Biomedical, Chemical, and
Materials Science are in Dougherty Hall. The Engineering
Fundamentals Division, Engineering Advising Services, and
Engineering Diversity Programs offices are located in Estabrook
Hall. The Office of Professional Practice is in Perkins Hall. The
Engineering Physics program is administered through the Physics
Department in the Nielsen Physics Building.

Advising Services
http://www.engr.utk.edu/advising/

Engineering Advising Services provides excellent academic
program planning services to undergraduate students in the
College of Engineering, with specific attention given to the fresh-
man class. Central to the mission of academic advising at the uni-
versity is teaching students to understand the purpose of the cur-
riculum and fostering their intellectual and personal development
toward academic success and lifelong learning. Through individ-
ual, collaborative relationships with academic advisors students
are best able to define and implement sound educational plans
that are consistent with their personal values, goals, and career
plans.

The College of Engineering is committed to the belief that
academic advising engages students by teaching them how to
become members of the higher education community, to think
critically about their role and responsibilities as engineers, and
to prepare them to be educated members of a global communi-
ty. The students’ learning outcomes of academic advising in the
college are to craft a coherent educational plan based on
assessment of abilities and interests; use a variety of campus
resources to set goals, reach decisions, and achieve those
goals; assume responsibility for meeting academic program
requirements; cultivate the intellectual habits that lead to a life-
time of learning; and behave as citizens who engage in the
wider world around them. The Advising Services Office is locat-
ed in 202 Estabrook Hall. The office can be reached by phone
at (865) 974-4008.

New freshman students are assigned to Engineering Advising
Services for academic advising until they have completed the
freshman curriculum. Freshmen students admitted to the College
of Engineering are required to designate a field of study by the
end of their freshman year. Upon completion of Engineering
Fundamentals 152 (or equivalent), the students are assigned
faculty advisors in their selected departments.

First-Year Courses for Honors
Concentrations
(For Computer Science, see listing in Department of
Electrical Engineering And Computer Science section)

Beginning students who wish to pursue an honors concentra-
tion in one of the engineering majors will normally be part of the
Chancellor’s Honors Program. Requirements for first-year
coursework duplicate those of the Chancellor’s Honors Program.
Coursework requirements in the upper division are specific to the
individual departments and the student is referred to those indi-
vidual descriptions for explanation.

Specifically, first year requirements are:

• English 118, under the same conditions as stated in the
requirements for the Chancellor’s Honors Program.

• University Honors 100.

• One 200-level University Honors seminar to be completed
during the second semester of the freshman year.

• Four additional 100- or 200-level honors courses. For engi-
neering students, these would normally be Engineering
Fundamentals 157, Engineering Fundamentals 158, and
two courses chosen from Mathematics 147, 148, 247 or
Chemistry 128, 138.

Other courses may be approved by the individual engineering
departments upon entry to their honors concentration.

Office of Professional Practice
www.coop.utk.edu

The University of Tennessee College of Engineering encour-
ages all its students to obtain relevant paid work experience
through the Office of Professional Practice. Engineering students
can choose to participate in Cooperative (Co-op) Engineering or the
College’s Internship Program. Both offer qualified assignments that
are an integral part of the educational process, as well as helps UT
engineers identify skills, build networks, and foster relations in the
engineering community.

Since 1926, UT engineers have blended classroom theory with
practical engineering application in corporate or government set-
tings. The Co-op Engineering Program is a study-work plan of edu-
cation in which a student alternates periods of campus coursework
with periods of employment in industry related to the student’s
major. As the second oldest Co-op Engineering Program in the
south, most UT engineers work in assignments across the United
States, however, more students are seeking opportunities interna-
tionally. Currently, over 40% of the undergraduate engineering stu-
dents register and pursue one of the many positions available. One
of the value added components is that all positions are paid.
Salaries vary between organizations and locations. Most students
are able to offset a substantial amount of college expenses with Co-
op or Intern savings. We encourage our students to seek exposure
that offers depth and skills development.

Professional staff will work in conjunction with advisors to out-
line academic work plans (Degree Plan), and address scholar-
ship issues to schedule cycles of full-time academic terms with
alternating terms of work. The University of Tennessee believes that
this process offers a "real world" understanding of after graduation
expectations. It also affords each student feedback from the
employer to help gauge areas of interest and career direction. An
added incentive, many companies hire their Co-op students for full-
time employment after graduation.

Internships through the Office of Professional Practice follow the
same standard of quality, but tend to be just one term. Most inter-
ships are offered in the summers (10-13 weeks) and are very com-
petitive; and just like Co-op Engineering assignments, are moni-
tored by university professionals. Sound advising helps intern can-
didates pursue positions offered at times other than summers.

All students in the College of Engineering can participate and
should begin reviewing these opportunities the first semester at UT.
Because of changing economic trends, some engineering majors
may be in greater demand and selection criteria will vary among
organizations. The practice of engineering is an art, which is
learned on the job site as well as in the classroom. Only those stu-
dents completing at least 52 weeks of approved work experiences
will receive the Program’s Cooperative Engineering Certificate. All
students participating in internships and co-op engineering pro-
grams through the Office of Professional Practice must enroll in
Engineering Fundamentals 333 (1) for each semester employed in
a co-op or internship assignment.

Further details are available on our Web site or write to: Office
of Professional Practice; 310 Perkins Hall; Knoxville, Tennessee
37996-2030.

International Engineering Program
The United States, like most countries throughout the world, can
no longer thrive economically with only a domestic market for its
goods and services. To compete in the global marketplace, engi-
neers must understand how to design and manufacture products
for world-wide use. The College of Engineering works with several
organizations, both on and off campus, to enable interested students to participate in significant engineering experiences abroad. Students interested in making an international experience part of their engineering education should begin exploring opportunities and develop plans during the freshman year. Language preparation to a level of substantial proficiency may be required. Thus, language preparation should be started immediately. For further information on international engineering educational programs, contact the Center for International Education, 1620 Melrose Avenue.

Graduate Program

Graduate programs leading to the Master of Science are offered in twelve majors – aerospace engineering, biomedical engineering, chemical engineering, civil engineering, electrical engineering, engineering science, environmental engineering, industrial engineering, materials science and engineering, mechanical engineering, nuclear engineering, and polymer engineering. The Doctor of Philosophy is offered in twelve majors – aerospace engineering, biomedical engineering, chemical engineering, civil engineering, computer science, electrical engineering, engineering science, industrial engineering, materials science and engineering, mechanical engineering, nuclear engineering, and polymer engineering. See the Graduate Catalog for information on these programs.

Tau Beta Pi National Headquarters

The college is honored to have the national headquarters of Tau Beta Pi, the Engineering Honor Society, housed on our campus since 1907. This honor was earned in part through the untiring efforts of R.C. “Red” Matthews, Secretary-Treasurer for the organization from 1905 to 1947. The suite of offices, located in Dougherty Hall, is occupied by Mr. J.D. Froula, Secretary-Treasurer, R.E. Hawks, Assistant Secretary-Treasurer, and eight additional staff members.

National Accreditation

Since 1936, engineering programs at institutions of higher learning have been accredited by an organization formed by many engineering societies and known as the Accreditation Board for Engineering and Technology (ABET). ABET accreditation ensures that graduates of the University of Tennessee, Knoxville, engineering programs are adequately prepared to enter and continue the practice of engineering. Accredited engineering programs at the University of Tennessee, Knoxville, include aerospace, biomedical, biosystems, chemical, civil, computer, electrical, industrial, mechanical, materials science, and nuclear.

Accreditation criteria require each engineering degree program to design a curriculum and educational process that will achieve defined educational objectives consistent with ABET criteria and the mission of the University of Tennessee, Knoxville. The educational objectives of each degree program are presented by the department responsible for the program later in this chapter. In each case the objectives are consistent with the mission of the College of Engineering. That mission is to

• Provide high quality education in the major engineering disciplines from the undergraduate through doctoral levels through a creative balance of academic, professional, and extracurricular programs.
• Foster and maintain mutually beneficial partnerships with our alumni, friends, industry, and state, and federal governments through public services, assistance, and collaborative research.
• Be a major contributor to our nation’s technology base through scholarship and research.

In addition, the educational objectives of each degree program are also guided by and consistent with the strategic objectives of the College of Engineering. Two particularly relevant strategic objectives are “to continuously provide quality delivery of courses, programs, extracurricular activities, assistance, and support that enhances each student’s desire to learn and that excites each student’s interest in engineering and the work environment” and “to continuously provide and improve the education and working abilities that employers want our engineering graduates to have.”

ABET accreditation criteria also require an assessment process to ensure that program outcomes critical to successful engineering practice are being achieved. Assessment of eleven program outcomes common to all engineering disciplines are required by ABET. Specifically, each engineering degree program must demonstrate that its graduates have

• An ability to apply knowledge of mathematics, science, and engineering.
• An ability to design and conduct experiments, as well as to analyze and interpret data.
• An ability to design a system, component, or process to meet desired needs.
• An ability to function on multi-disciplinary teams.
• An ability to identify, formulate, and solve engineering problems.
• An understanding of professional and ethical responsibility.
• An ability to communicate effectively.
• The broad education necessary to understand the impact of engineering solutions in a global/societal context.
• A recognition of the need for and an ability to engage in life-long learning.
• A knowledge of contemporary issues.
• An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The College of Engineering has embraced these program outcomes as valid and valuable indicators of educational program effectiveness. Thus, the college prepares students to demonstrate sufficiency and to strive for excellence in each of these areas. This goal is achieved by ensuring that instruction and other learning experiences are provided that will produce each program outcome. Engineering courses, mathematics and natural science courses, and the humanities and social sciences each provide essential contributions to the achievement of this goal. Program outcomes that are critically dependent on humanities and social science courses are discussed in the General Education Requirement section to follow. Additional program outcomes selected by individual degree programs to supplement ABET outcomes are also discussed in subsequent sections.

Designation of a Minor

An engineering undergraduate may declare a minor in an engineering or a non-engineering subject area and have the minor listed on the permanent record under the following conditions.

• Minors must be officially approved and described in the Undergraduate Catalog. No unofficial minors will be recognized.
• Courses taken to satisfy the minor may also be used to satisfy engineering degree requirements provided that the courses would be a part of engineering degree requirements even if no minor was declared. Completion of a minor often involves the taking of some courses which cannot be used to satisfy the minimum requirement for an engineering degree.
• A student should notify his or her advisor and major department office when beginning work on a minor. The intention to complete a minor must be declared at the time of application for graduation if the minor is to appear on the final transcript. Graduation applications are available in the Office of the University Registrar.
Minor in Reliability and Maintainability Engineering

A coursework program leading to a minor in reliability and maintainability engineering is offered by the College of Engineering. Fifteen hours of coursework are required as listed below. The grade in each of the required classes must be at least a C. Students should consult with their advisor for the appropriate elective courses in their major.

### Hours Credit

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Engineering 483 or Mechanical Engineering 483</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Industrial Engineering 484 or Mechanical Engineering 484</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Nuclear Engineering 483 or Nuclear Engineering 484</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Industrial Engineering 484 or Mechanical Engineering 484</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Materials Science and Engineering 484 or Nuclear Engineering 484</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Mathematics 323</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Electrical and Computer Engineering 313</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Statistics 251</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Electives (choose at least 2)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Chemical Engineering 360</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Electrical and Computer Engineering 315, 471</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Industrial Engineering 300</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Nuclear Engineering 304</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Statistics 365 (for non-Industrial Engineering)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mechanical Engineering 345, 363</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Total 15

### Course Load

The maximum number of hours which can be taken by an undergraduate engineering student without special permission is 19. The Associate Dean for Student Affairs (or designee) must give permission to take 20 hours or more. In general, this decision is based on the student’s previous performance at the University of Tennessee, Knoxville. Students can obtain the required paperwork to request an overload either in the Engineering Advising Services Office or on the College of Engineering Web site under the Advising Services section.

### General Requirements

Students are advised to consult the university’s degree requirements as stated in the front section of this catalog, as well as departmental requirements.

### Transfer Students

Transfer students, including internal University of Tennessee, Knoxville, transfers, must meet the minimum requirements stated below to be considered for admission to a major within the college.

- Must have earned a minimum 2.30 cumulative average and a C or better in each of these specific courses, or their equivalent: English 101, Chemistry 120, and Mathematics 141 (and subsequent courses in the three sequences, if taken).
- The overall record will be evaluated for quality and seriousness of purpose. An excessive number of withdrawals, incompletes, repeated courses, or failures may result in denial.

Any University of Tennessee, Knoxville, student desiring association with one of the departments of the College of Engineering should go to the departmental office for the desired major. An interview with the department head or his/her designee is held, with the major items of consideration being the same as for external transfer students. If association is granted, the departmental (major) office will update the student’s college and major within the university computer system.

### Transfer Credit

Every attempt will be made to give maximum credit for courses taken elsewhere and transferred to the college. Discussions concerning the evaluation of transfer credits should be conducted with the head of the department (or designee) into which the student is to transfer, but only after receiving the evaluation of transfer credits by the Admissions Office.

### Second Bachelor of Science Degree

Upon approval by the Dean of Engineering and the Committee on Degrees of a program of study recommended by the major engineering department, a student who already holds a bachelor’s degree may obtain a degree in engineering upon meeting all of the course requirements of the selected engineering program. In no case will the minimum requirement be less than 30 semester credits. The prevailing university regulations shall apply.

### University General Education Requirement

The University of Tennessee has established a University General Education Requirement that includes emphases upon building basic skills and developing broadened perspectives. These requirements apply to all undergraduate students and are listed at the front of this catalog. Engineering students should consult with their advisor and carefully select General Education Electives to ensure that courses meet both the general education needs of their program and the University General Education Requirement.

### American History Requirement

Engineering students, regardless of national origin, must fulfill the American history requirement described in the Academic Policies and Procedures section of this catalog. Those students who have not had the required year of American history in high school may choose the required 6 hours from History 221 and 222, or other courses deemed suitable by the Department of History. See additional information about the American History Requirement in the Academic Policies and Procedures section of this catalog.

### Technical Electives

Technical electives are to be selected with the advice and approval of the student’s major department. In some of the curricula tabulations, a choice of such electives is indicated and regulations in regard to their selection are stated.

### The Voluntary ROTC Program

Engineering students may participate in the ROTC Program. Advanced ROTC courses (300- and 400-series) may be counted as technical elective credit toward an engineering degree up to a total of 6 hours. Normally, military science and leadership courses cannot be used as humanities/social science electives. Individual departments determine the appropriate substitutions.

### Approval of Electives and Substitutions

Each student shall discuss with an advisor the status of the program of study no later than the beginning of the second semester prior to anticipated graduation. Any necessary additions to or substitutions in the program or electives requiring special approval must be approved in writing at that time. It is each student’s responsibility to see that all necessary approvals are secured. Inattention to such matters will most likely delay graduation.

### Curricula

Course requirements for the various engineering curricula are listed in each department’s section. Individual course prerequisites should be strictly adhered to, even if courses are not taken in the semester indicated. Although the requirements for each major can be completed in four academic years (five for the cooperative program), the quality of the learning experience is much more important than the speed with which the curricula are completed.

Questions about individual courses should be directed to the department responsible for the course. Questions about a particular curriculum should be directed to the major department.
Prerequisites

Before registering for any engineering course, a student should make certain that any necessary background work has been completed. In addition to specific prerequisites listed, it is assumed that a student taking sophomore engineering courses has completed all freshman courses, whether specifically listed as a prerequisite or not. When this is not the case, a student should seek advice from the advisor or department responsible for the course in question before registration in order to minimize the chances of academic difficulty. Students who do not have prescribed prerequisites may be dropped from a course at any time during a semester when the lack of prerequisites is discovered.

Probation and Dismissal Procedures

Academic Probation in Engineering

The university will review students having academic difficulty and on academic probation the week after final grades are posted. The university academic probation policy is stated in the Academic Policies and Procedures section of this catalog.

Dismissal from Engineering

Students dismissed from the College of Engineering and/or the University of Tennessee, Knoxville, will be removed from all courses if pre-registered for the following term. Dismissed students must follow university policies and procedures regarding academic dismissal and readmission as stated in the Academic Policies and Procedures and Admission to the University sections in this catalog. Dismissed students who are re-admitted will be University Undecided status and advised in the Arts and Sciences Advising Office. Dismissed students may no longer pursue a major in the College of Engineering.

ENGINEERING FUNDAMENTALS DIVISION

J. R. Parsons, Director

Professors
Bennett, R.M., Civil and Environmental Engineering
Parsons, J.R., Mechanical, Aerospace and Biomedical Engineering

Associate Professors
Pionke, C.D., Mechanical, Aerospace and Biomedical Engineering
Scott, T.H., Nuclear Engineering

Instructor
Schleeter, W.R., Engineering Fundamentals

The Engineering Fundamentals Division is the academic home for all first-year engineering students. Located in Estabrook Hall, the division serves as a focus for all freshman student activities. The faculty of the division teach the principal courses in Engineering Fundamentals. These courses are designed to prepare students for entry into the sophomore year of every major in the college.

Academic standards in the first year are necessarily high. To assist students with deficient academic backgrounds in the necessary mathematics and computer skills, supplementary resources are offered as needed.

Minor in Engineering Communication and Performance

The division co-administers, with the College of Education, Health, and Human Sciences, the engineering communication and performance minor for engineering students desiring additional training and certification in team facilitation and organizational communication. (See College of Education, Health, and Human Sciences – Department of Educational Psychology and Counseling catalog section for requirements.)
on preparation for graduate school or professional employment, and to concentrate in either chemical or biomolecular tracks. To graduate from chemical and biomolecular engineering programs, students must complete the curriculum with a grade of C or better in all required chemical engineering courses, as well as meeting general university and college requirements.

A minimum of 18 hours of general education courses is required. These courses must meet the University General Education Requirement. A writing course (WC) and oral communication course (OC) must be included in the general education electives.

**Progression to Upper Division**

Progression of students in the Department of Chemical and Biomolecular Engineering to departmental courses numbered 310 and above is competitive and is based on capacity. Factors considered include overall grade point average, performance in selected lower-division courses, and evidence of satisfactory and orderly progress through the prescribed curriculum.

**Upper-Division Status**

A lower-division student must apply for progression to upper-division status after completing Chemical Engineering 201, 235, 240, and 250 with a grade of C or better in each course and an overall GPA of 2.30 or better.

**Provisional Status**

Students who have completed Chemical Engineering 201, 235, 240, and 250 with an overall GPA of at least 2.30 may apply for provisional status. The granting of provisional upper-division status is based on availability of space in the departmental programs after upper-division status students have been accommodated. Provisional students are required to demonstrate the ability to perform satisfactorily in upper-division courses by completing a total of seven departmental courses with a grade of C or better in each course (including the four required for upper-division status). Permission to continue with upper-division classes depends on this minimum level of performance.

Any student with an overall GPA below 2.10 will not be admitted to upper-division chemical engineering courses. Students who have not been admitted to upper-division or provisional status will be dropped from upper-division departmental class rolls.

**Transfer Students**

Upper-division level transfer students are admitted on a provisional status basis only.

**CHEMICAL ENGINEERING MAJOR**

**Requirements for the Bachelor of Science in Chemical Engineering**

<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 101* or 118*, 102*</td>
<td>6</td>
</tr>
<tr>
<td>Chemistry 120* or 128*, 130* or 138*</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics 141* or 147*, 142* or 148*</td>
<td>8</td>
</tr>
<tr>
<td>Engineering Fundamentals 105, 151 or 157, 152 or 158</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering 201, 235, 240, 250</td>
<td>15</td>
</tr>
<tr>
<td>Mathematics 200, 231, 241 or 247</td>
<td>8</td>
</tr>
<tr>
<td>Engineering Fundamentals 230</td>
<td>2</td>
</tr>
<tr>
<td>Biology 140*</td>
<td>4</td>
</tr>
<tr>
<td>General Education Elective (Social Science)*</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering 301, 310*(WC), 340, 360, 380</td>
<td>13</td>
</tr>
<tr>
<td>Chemistry 350</td>
<td>3</td>
</tr>
<tr>
<td>1General Education Electives (Arts and Humanities)*</td>
<td>6</td>
</tr>
<tr>
<td>Physics 231</td>
<td>3</td>
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<tr>
<td>2Chem Option I</td>
<td>3</td>
</tr>
<tr>
<td>2Bio Option I</td>
<td>3</td>
</tr>
<tr>
<td>3Technical Elective</td>
<td>3</td>
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</table>

<table>
<thead>
<tr>
<th>Fourth Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering 401, 445, 450, 480, 488 or 490</td>
<td>13</td>
</tr>
<tr>
<td>2Chem/Bio Option II</td>
<td>3</td>
</tr>
<tr>
<td>General Education Electives (Cultures and Civilizations, and Social Science)*</td>
<td>9</td>
</tr>
<tr>
<td>3Technical Electives</td>
<td>6</td>
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</tbody>
</table>

**BIOMOLECULAR ENGINEERING CONCENTRATION**

**Requirements for the Bachelor of Science in Chemical Engineering • Biomolecular Engineering Concentration**

<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 101* or 118*, 102*</td>
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<tr>
<td>Chemistry 120* or 128*, 130* or 138*</td>
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<tr>
<td>Mathematics 141* or 147*, 142* or 148*</td>
<td>8</td>
</tr>
<tr>
<td>Engineering Fundamentals 105, 151 or 157, 152 or 158</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering 201, 235, 240, 250</td>
<td>15</td>
</tr>
<tr>
<td>Mathematics 200, 231, 241 or 247</td>
<td>8</td>
</tr>
<tr>
<td>Engineering Fundamentals 230</td>
<td>2</td>
</tr>
<tr>
<td>Biology 140*</td>
<td>4</td>
</tr>
<tr>
<td>1General Education Elective (Social Science)*</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering 301, 310*(WC), 340, 360, 380</td>
<td>13</td>
</tr>
<tr>
<td>Chemistry 350</td>
<td>3</td>
</tr>
<tr>
<td>1General Education Electives (Arts and Humanities)*</td>
<td>6</td>
</tr>
<tr>
<td>Physics 231</td>
<td>3</td>
</tr>
<tr>
<td>Biology 240</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Engineering 401, 445, 450, 475, 480, 488 or 490</td>
<td>16</td>
</tr>
<tr>
<td>2Bio Option I</td>
<td>3</td>
</tr>
<tr>
<td>Biochemistry and Cellular and Molecular Biology 401, 402</td>
<td>8</td>
</tr>
</tbody>
</table>

* Meets University General Education Requirement.
1 Students must also meet the Oral Communication requirement through a course with an (OC) designation (for example, Philosophy 242 or Philosophy 244).
2 See departmental Web site for course listings.

**HONORS CONCENTRATIONS**

The honors concentrations encourage highly motivated students to experience a more rigorous preparation in the Department of Chemical and Biomolecular Engineering. Admission is selective and students will normally be participating in the Chancellor’s Honors Program as well. Application to the honors concentrations is made when the student applies for upper-division status.

Candidates for the honors chemical engineering concentration and the honors biomolecular engineering concentration must complete the following requirements.

- First-year courses for honors concentrations in the engineering majors.
- Further requirements for the honors chemical engineering concentration and the honors biomolecular engineering concentration are as follows. Maintain an overall GPA of at least 3.30 and a GPA of at least 3.30 in departmental courses. Complete Mathematics 247, Chemistry 483; Chemical Engineering 407, 447, and one of the following: Chemical Engineering 467, 477, 478, 488, 498. Complete a 3-hour senior design course. This requirement is satisfied by Chemical Engineering 488.
CIVIL ENGINEERING MAJOR

Requirements for the Bachelor of Science in Civil Engineering

First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 120* or 128*, 130* or 138*</td>
<td>8</td>
</tr>
<tr>
<td>English 101* or 118*, 102*</td>
<td>8</td>
</tr>
<tr>
<td>Engineering Fundamentals 105, 151 or 157, 152 or 158</td>
<td>9</td>
</tr>
<tr>
<td>Mathematics 141* or 147*, 142* or 148*</td>
<td>8</td>
</tr>
</tbody>
</table>

Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Humanities Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Civil Engineering 205*, 210, 261</td>
<td>9</td>
</tr>
<tr>
<td>Cultures and Civilizations Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Fundamentals 202</td>
<td>2</td>
</tr>
<tr>
<td>Mathematics 231, 241 or 247, 251 or 267</td>
<td>10</td>
</tr>
<tr>
<td>Physics 231*</td>
<td>3</td>
</tr>
<tr>
<td>Statistics 251</td>
<td>3</td>
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</table>

Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Humanities Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Civil Engineering 305, 321, 330, 351, 352, 361, 380, 390, 416</td>
<td>27</td>
</tr>
<tr>
<td>Cultures and Civilizations Elective*</td>
<td>3</td>
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</table>

Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering 401, 435, 440, 442, 471, 480</td>
<td>16</td>
</tr>
<tr>
<td>Civil Engineering 400</td>
<td>3</td>
</tr>
<tr>
<td>Civil Engineering Elective</td>
<td>3</td>
</tr>
<tr>
<td>Civil Engineering/Technical Elective</td>
<td>3</td>
</tr>
<tr>
<td>Social Sciences Elective*</td>
<td>6</td>
</tr>
</tbody>
</table>

Total 128

* Meets University General Education Requirement.

All electives must be pre-approved by the advisor and the department head.

HONORS CONCENTRATION

Students who wish to pursue the honors civil engineering concentration will normally be part of the Chancellor’s Honors Program. Candidates for the honors civil engineering concentration must complete the following requirements.

- First-year courses for honors concentrations in the engineering majors.
- Two upper-division honors courses in civil engineering via honors-by-contract or Civil Engineering 407. The contract must be submitted to the Chancellor’s Honors Program for approval by the third week of the semester.
- A minimum of 3 credit hours of an honors senior project course. This requirement may be satisfied by Civil Engineering 407 or by enrolling in the honors section of the senior capstone design course (Civil Engineering 400).

Minor in Environmental Engineering

The College of Engineering offers a minor in environmental engineering to those undergraduate students whose academic history provides the prerequisites for the courses required by the minor. The minor requires the completion of a minimum of 21 credits in coursework which builds the foundation of an environmental engineering perspective. Some of the courses used in the minor may also satisfy a requirement for a major. Students are advised that the first professional degree in environmental engineering at the University of Tennessee, Knoxville, is the Master of Science with a major in environmental engineering which builds on the minor.

Students are asked to file their intent to complete the minor with the Department of Civil and Environmental Engineering, 223 Perkins Hall. The student’s home department advisor will then be supplied with the information about the minor requirements to assist with prerequisite sequencing.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering 486</td>
<td>3</td>
</tr>
<tr>
<td>Microbiology 210</td>
<td>3</td>
</tr>
<tr>
<td>Select one from: Chemistry 230, 310, or 350</td>
<td>3</td>
</tr>
<tr>
<td>Select two from: Chemical Engineering 201, Biosystems Engineering 221, Civil Engineering 380, 416</td>
<td>6</td>
</tr>
<tr>
<td>Select one from: Geology 202 or Philosophy 245</td>
<td>3</td>
</tr>
</tbody>
</table>
The goals of the three Bachelor of Science programs, computer engineering, computer science, and electrical engineering, are to prepare students for entry into the profession; to instill in students the capabilities required by the discipline, the recognition of the need to enhance the discipline, and the desire for life-long learning; and to equip students with a general knowledge of technical and non-technical disciplines so that they are prepared for further study in other fields including professional and graduate education.

The Bachelor of Science programs are based on a series of integrated courses. Students advance through a program in a sequential manner guided by prerequisite and co-requisite courses in the showcase curricula. These integrated sequentially-developed programs are highlighted by the systematic inclusion of the design process introduced in the second year.

Program Educational Objectives
- Will apply the knowledge of the fundamentals of engineering, science, and mathematics in the practice of computer engineering, computer science, and electrical engineering or in advanced professional studies; will identify, formulate and solve computer engineering, computer science, and electrical engineering problems.
- Will design, analyze, and implement complex devices and systems containing hardware and software components while considering a combination of economic, ethical, safety, environmental, and social issues; will be able to use modern engineering and scientific techniques, skills, and tools.
- Will communicate effectively, function on multi-disciplinary teams, and engage in lifelong learning.

Program Outcomes
In addition to the eleven program outcomes listed in the College of Engineering section on National Accreditation, outcomes also include knowledge of probability and statistics including applications, discrete math, and an understanding of advanced mathematics in the areas of differential equations, numerical analysis, linear algebra, and calculus. The computer engineering and electrical engineering programs are under continuous assessment and improvement based on Engineering Criteria 2000. The advisory committee to the department, which is made up of persons from industry, government, higher education students, recent graduates, and faculty, provides constituent input for setting program educational objectives and outcomes and establishing the requisite assessment modes for the program.

General
The courses of study for the Bachelor of Science in Computer Engineering, the Bachelor of Science in Computer Science, and the Bachelor of Science in Electrical Engineering are structured to provide a foundation in both the basic sciences and the specialized areas of the respective disciplines. The programs also have sufficient general education electives to enhance the cultural growth of the student and develop professionals with a strong social awareness. The faculty seeks to keep classes small enough to allow effective interaction with students.

The selection of general education elective courses is left to each student but must be made in accordance with established College of Engineering policy.

To be eligible for the Bachelor of Science degree, a student must earn at least 30 hours of upper-division courses in the Department of Electrical Engineering and Computer Science at the University of Tennessee, Knoxville.

Generally, all sophomore- and junior-level courses taught in the department are taught at least twice per year. Senior-level courses are normally offered in either the fall or spring semester. Courses for which a senior course is a prerequisite will be normally offered in the spring semester with the prerequisite senior course being offered in the fall semester. This scheduling arrangement allows for flexibility since the student may elect the normal four-year schedule, an accelerated schedule, or choose to participate in the cooperative engineering program.

The department maintains a number of laboratory facilities to support the undergraduate teaching program. The laboratories are devoted specifically to circuits and systems, communications, computer networks, digital systems, electronics, image processing, electric machines, and power electronics and drives. Multiple Linux and Windows computer laboratories are available to students within the department.

The department requires at least a C in every computer engineering, computer science, electrical engineering, and mathematics courses.
ics course used for the undergraduate degrees.

Progression of departmental undergraduate students to the upper-division programs of the department is competitive and is based on the space available in the department. Factors considered in the decision include overall grade point average, grades earned in courses required in the lower division curricula of the department and College of Engineering, and seriousness of purpose and interest in departmental programs as exemplified by regular and orderly progress through the prescribed curriculum without abuse of withdrawal and course repeat privileges.

Students who take Electrical and Computer Engineering 300 will be evaluated during the semester they are registered for it. Transfer students for whom Electrical and Computer Engineering 300 transfer credit is given may take 9 semester hours in departmental courses before progression evaluation. All students, whether or not they transfer in, who are not accepted into the upper-division program of the department will be put in either a temporary probationary status or a non-progressed status and will not be permitted to register for any upper division courses within the department.

HONORS CONCENTRATIONS

Students who wish to pursue the honors electrical engineering concentration, honors computer engineering concentration, and honors computer science concentration will normally be part of the Chancellor’s Honors Program.

Candidates for the honors electrical engineering concentration and honors computer engineering concentration must complete the first year courses for honors concentration in the engineering majors. Candidates for the honors computer science concentration must meet the first year requirements for the Chancellor’s Honors Program.

In addition to satisfying the requirements described above, candidates for these three honors concentrations must also satisfy the following requirements.

- Two upper-division honors courses in computer science or electrical and computer engineering via Honors-by-Contract or Honors Independent study, or equivalent. The contract or independent study must be submitted to the Chancellor’s Honors Program for approval by the third week of the semester.
- Complete a 3-credit hour senior project course. This can normally be completed as part of the capstone design course, Electrical and Computer Engineering 400 for computer engineering and electrical engineering majors or Computer Science 400 for computer science majors.

COMPUTER ENGINEERING MAJOR

Students in the senior year may choose from a wide spectrum of courses covering various aspects of computer engineering, computer science, electrical engineering, and related fields. Students must meet the design, depth, and breadth requirements in the department in their selection of these courses. Students are encouraged to discuss an appropriate senior program with their advisors.

Requirements for the Bachelor of Science in Computer Engineering

First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 101* or 118*, 102*</td>
<td>6</td>
</tr>
<tr>
<td>Chemistry 120*</td>
<td>4</td>
</tr>
<tr>
<td>Math 141* or 147*, 142* or 148*</td>
<td>8</td>
</tr>
<tr>
<td>Engineering Fundamentals 151 or 157, 152 or 158, 105</td>
<td>9</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 206</td>
<td>4</td>
</tr>
</tbody>
</table>

Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 231, 241, 251</td>
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<td>Physics 231*, 232*</td>
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<td>Electrical and Computer Engineering 255, 313</td>
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<tr>
<td>Electrical and Computer Engineering 300</td>
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</tr>
<tr>
<td>Computer Science 140</td>
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Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical and Computer Engineering 315, 335</td>
<td>7</td>
</tr>
<tr>
<td>Computer Science 302, 360</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics 300 or 307</td>
<td>3</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 316, 342, 355, 395</td>
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<tr>
<td>Philosophy 241*, 243*, or 244*</td>
<td>3</td>
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<tr>
<td>Cultures and Civilizations Electives*</td>
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Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical and Computer Engineering 451-453 or 451-455</td>
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<td>Electrical and Computer Engineering 400*</td>
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</tr>
<tr>
<td>Computer Engineering Senior Electives</td>
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</tr>
<tr>
<td>Arts and Humanities Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Social Sciences Electives*</td>
<td>6</td>
</tr>
<tr>
<td>Engineering Fundamentals 402</td>
<td>1</td>
</tr>
</tbody>
</table>

Total 128

* Meets University General Education Requirements.
1 Engineering Fundamentals 157 and 158 are honors versions of Engineering Fundamentals 151 and 152. Students in the Chancellor’s Honors Program are not required to take Engineering Fundamentals 402.
2 Can be taken at any time.
3 Must be in electrical and computer engineering courses. At most, one computer engineering senior elective can be from any 300-level electrical and computer engineering courses. Approved senior electives are Electrical and Computer Engineering 325, 336, 341, 415, 416, 421, 422, 431, 432, 433, 441, 442, 443, 446, 453, 455, 471, 472, 481, and 482.

COMPUTER SCIENCE MAJOR

Students may choose from a wide spectrum of courses covering various aspects of computer science, computer engineering, and related fields. Students must meet the design, depth, and breadth requirements in the department in their selection of these courses. Students are encouraged to discuss an appropriate program with their advisors.

Requirements for the Bachelor of Science in Computer Science

First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science 102, 140</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics 141* or 147*, 142* or 148*</td>
<td>8</td>
</tr>
<tr>
<td>Physics 135* or 137*, 136* or 138*</td>
<td>8-10</td>
</tr>
<tr>
<td>English 101* or 118*, 102*</td>
<td>6</td>
</tr>
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Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science 160, 311, 302</td>
<td>11</td>
</tr>
<tr>
<td>Mathematics 241 or 247, 251 or 257, 300 or 307</td>
<td>10</td>
</tr>
<tr>
<td>Biology 101 or 130 or Chemistry 100 or 120 or Physics 231</td>
<td>3-4</td>
</tr>
<tr>
<td>Philosophy 241, 242, 243, or 244*</td>
<td>3</td>
</tr>
<tr>
<td>Oral Communications General Education Elective*</td>
<td>3</td>
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</table>

Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science 360, 365, 380</td>
<td>11</td>
</tr>
<tr>
<td>Computer Science 340 or 370 or Math 371</td>
<td>3-4</td>
</tr>
<tr>
<td>Mathematics 323 or Electrical &amp; Computer Engineering 313</td>
<td>3</td>
</tr>
<tr>
<td>Computer Science Upper Division Elective or Mathematics 231</td>
<td>3</td>
</tr>
<tr>
<td>Cultures and Civilizations Electives*</td>
<td>6</td>
</tr>
<tr>
<td>Social Science Elective*</td>
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</tr>
<tr>
<td>General Elective</td>
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Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science 400</td>
<td>5</td>
</tr>
<tr>
<td>Computer Science Upper Division Electives</td>
<td>15</td>
</tr>
<tr>
<td>English 355* or 360*</td>
<td>3</td>
</tr>
<tr>
<td>Arts and Humanities Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective*</td>
<td>3</td>
</tr>
</tbody>
</table>

Total 120-124

* Meets University General Education Requirements.
1 Can be taken anytime.
2 Mathematics 231 can be substituted for three hours of upper-division computer science electives.
3 Must be approved by advisor.

Minor In Computer Science

The College of Engineering offers a minor in computer science to those undergraduate students whose academic history provides the prerequisites for the courses required by the minor. The minor
requires the completion of a minimum of 24 credits in computer science courses. Some of the courses used in the minor may also satisfy requirements for the student's major. A grade of C or better is required in all computer science courses applied to the minor. The last 12 hours must be taken at the University of Tennessee, Knoxville. The minor is not open to computer engineering majors.

Students may enroll in the minor program by completing a form at the Electrical Engineering and Computer Science office. A copy of the completed enrollment form and information on the minor requirements will be forwarded to the student's home department advisor.

**Approved Engineering Elective Courses**

**Electrical Engineering Major**

- **First Year**
  - English 101 or 118, 102* ........................................ 6
  - Chemistry 120* .................................................. 4
  - Mathematics 141* or 147, 142* or 148* ......................... 8
  - Engineering Fundamentals 151 or 157, 152 or 158, 105 ........ 9
  - Electrical and Computer Engineering 206 .......................... 4

- **Second Year**
  - Mathematics 200, 231, 241 .................................... 8
  - Physics 231*, 232* .............................................. 7
  - Electrical and Computer Engineering 255, 313 .................... 7
  - Electrical and Computer Engineering 300 ........................ 5
  - Philosophy 241*, 243*, or 244* .................................. 3

- **Third Year**
  - Electrical and Computer Engineering 315, 325, 335, 341 ...... 14
  - Electrical and Computer Engineering 316, 336, 342, 355, 395 .... 13
  - Social Sciences Elective* ........................................ 3

- **Fourth Year**
  - Electrical and Computer Engineering 400* ....................... 5
  - Electrical Engineering Senior Electives .......................... 12
  - Technical Electives ............................................ 6
  - Arts and Humanities Elective* .................................. 3
  - Cultures and Civilizations Elective* .............................. 6
  - Engineering Fundamentals 402 .................................. 1

**Total 127**

**Requirements for the Bachelor of Science in Electrical Engineering**

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science 102, 140, 160</td>
<td>12</td>
</tr>
<tr>
<td>Upper-division computer science courses</td>
<td>12</td>
</tr>
<tr>
<td>Total 24</td>
<td></td>
</tr>
</tbody>
</table>

1 Electrical Engineering majors may substitute Electrical and Computer Engineering 206 for Computer Science 102 and Electrical and Computer Engineering 255 for Computer Science 160.

2 Mathematics 371 may be substituted for 3 hours.

**ENGINEERING PHYSICS PROGRAM**

Soren P. Sorensen, Director  
Stuart B. Elston, Coordinator

Engineering physicists typically work in areas of applied science and emerging technology in which standard engineering practices are rapidly evolving to keep pace with advances in science. They are often involved in developing new engineering methods and principles. The goal of the engineering physics Bachelor of Science program is to prepare its students to apply the principles and problem-solving approaches of physics to the solution of engineering problems at the frontiers between science and technology by:

- Providing students with a thorough knowledge of mathematics, science, and engineering science with an emphasis on the principles of physics and of the derived physical, chemical, and biological sciences as appropriate to individual career goals.
- Training students in the communication, team cooperation, and problem identification and solving skills needed to practice engineering art in the modern world.
- Preparing students through experience and exposure to apply those principles and skills to the design and conduct of experiments, to the analysis and interpretation of measured results, and to the design of components, processes, and systems that meet specific, identified needs.
- Instilling in students understanding and appreciation of the cultural, historical, societal, economic, and environmental contexts in which problems of engineering and science arise, and to promote commitment to seek solutions which achieve appropriate balance of cultural, social, and technical value.

The program in engineering physics is designed to fulfill the educational requirements for professional work in various fields of applied science which are based upon a thorough knowledge of physics. The first two years of the curriculum are concerned with fundamental courses in engineering, science, mathematics, and general education. In the upper division, the curriculum allows some choice of courses in engineering and in physics depending on the interest and career goals of the student. The undergraduate program is a complete, professional program, equipping the student for entry into a variety of work in industry and research. The program also leads to graduate work in either physics or engineering.

**ENGINEERING PHYSICS MAJOR**

**Requirements for the Bachelor of Science in Engineering Physics**

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 101* or 118*, 102*</td>
<td>6</td>
</tr>
<tr>
<td>Mathematics 141* or 147, 142* or 148*</td>
<td>8</td>
</tr>
<tr>
<td>Engineering Fundamentals 151 or 157, 152 or 158, 105</td>
<td>9</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 400*</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics 200, 231, 241</td>
<td>8</td>
</tr>
<tr>
<td>Physics 231*, 232*</td>
<td>7</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 255, 313</td>
<td>7</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 300</td>
<td>5</td>
</tr>
<tr>
<td>Philosophy 241*, 243*, or 244*</td>
<td>3</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 315, 325, 335, 341</td>
<td>14</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 316, 336, 342, 355, 395</td>
<td>13</td>
</tr>
<tr>
<td>Social Sciences Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 400*</td>
<td>5</td>
</tr>
<tr>
<td>Electrical Engineering Senior Electives</td>
<td>12</td>
</tr>
<tr>
<td>Technical Electives</td>
<td>6</td>
</tr>
<tr>
<td>Arts and Humanities Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Cultures and Civilizations Elective*</td>
<td>6</td>
</tr>
<tr>
<td>Engineering Fundamentals 402</td>
<td>1</td>
</tr>
<tr>
<td>Total 126</td>
<td></td>
</tr>
</tbody>
</table>

* Meets University General Education Requirement.
1 Engineering Fundamentals 157 and 158 are honors versions of Engineering Fundamentals 151 and 152. Students in the Chancellor's Honors Program are not required to take Engineering Fundamentals 402.
2 Can be taken at any time.
4 Chemistry 130: Industrial Engineering 405; Materials Science and Engineering 201, 410; Mechanical Engineering 231, 321, 331, 344, Nuclear Engineering 342.
by definition a systems engineer, whose unique combination of human beings as a major variable and the industrial engineer. Industrial engineering is distinctive in two respects—the industrial engineer is concerned with the design of integrated systems involving people, materials, finance, equipment, and energy such that the overall system functions efficiently and human needs are adequately met. The interdisciplinary and multi-faceted approach to the multi-faceted problems associated with the production of, maintenance, and delivery of goods and services; fundamental human factors which influence engineering design, the economic analysis of alternative design choices, introductory economics and accounting, quality control techniques, and the mathematical modeling and simulation of complex systems, and the design and installation of information acquisition and control systems.

An ability to communicate effectively, both orally and in writing, to function on multi-disciplinary teams, to have a knowledge of pertinent contemporary issues, and to recognize the need for a commitment to lifelong learning. This curriculum emphasizes the knowledge and skills necessary to design integrated systems of people, materials, equipment, and energy such that the overall systems function at an optimal level and such that the needs of human components of the system are met. The solid, broad base in engineering, combined with education in applying engineering methodology to traditionally non-engineering problem areas as
provided through the industrial engineering curriculum, leads to participation by industrial engineers in an unlimited range of fields including retail distribution, banking, health care delivery, corporate management, municipal management, food industry, as well as traditional areas of manufacturing.

Outcomes

The eleven program outcomes listed in the College of Engineering section on National Accreditation are the accepted outcomes of the Industrial and Information Engineering Department.

INDUSTRIAL ENGINEERING MAJOR

Requirements for the Bachelor of Science in Industrial Engineering

<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals 120* or 128*</td>
<td>4</td>
</tr>
<tr>
<td>English 101* or 118*, 102*</td>
<td>6</td>
</tr>
<tr>
<td>Mathematics 141* or 147*, 142* or 148*</td>
<td>8</td>
</tr>
<tr>
<td>Engineering Fundamentals 105, 151, or 157, 152 or 158</td>
<td>9</td>
</tr>
<tr>
<td>Engineering Fundamentals 202</td>
<td>2</td>
</tr>
<tr>
<td>Social Sciences General Education Elective*</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting 200 or 207</td>
<td>3</td>
</tr>
<tr>
<td>Math 200, 231, 241, or 247</td>
<td>8</td>
</tr>
<tr>
<td>Physics 231*</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Fundamentals 230</td>
<td>2</td>
</tr>
<tr>
<td>Industrial Engineering 202, 250</td>
<td>4</td>
</tr>
<tr>
<td>Materials Science and Engineering 201</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Engineering 231, 331</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics 201* or 207*</td>
<td>4</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 301</td>
<td>3</td>
</tr>
<tr>
<td>Industrial Engineering 300, 301, 304, 405</td>
<td>12</td>
</tr>
<tr>
<td>Industrial Engineering 310, 330, 340, 350*</td>
<td>10</td>
</tr>
<tr>
<td>Philosophy 244*</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Engineering 401, 402, 404, 406</td>
<td>10</td>
</tr>
<tr>
<td>Industrial Engineering 421, 422, 427, 450</td>
<td>10</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>3</td>
</tr>
<tr>
<td>Cultures and Civilizations General Education Elective*</td>
<td>6</td>
</tr>
<tr>
<td>Arts and Humanities General Education Elective*</td>
<td>3</td>
</tr>
</tbody>
</table>

Total 128

* Meets General Education Requirement.
1 See Social Sciences – University General Education Requirement. Select one course from the list other than Economics 201 and 207.
2 Technical electives must be taken from the Department of Industrial and Information Engineering list of approved courses, or be approved by the advisor and the department head.
3 See Cultures and Civilizations – University General Education Requirement. Select two courses from the list or two courses in a foreign language at the intermediate level.
4 See Arts and Humanities – University General Education Requirement. Select one course from the list other than Philosophy 244 or Religious Studies 244.

HONORS CONCENTRATION

Students, who wish to pursue the honors industrial engineering concentration, will normally be part of the Chancellor’s Honors Program. Candidates for the honors concentration in industrial engineering must complete the following requirements.

• First-year courses for honors concentration in engineering majors.

• Two upper-division honors courses in industrial engineering via Honors-by-Contract or Honors Independent Study. The contract or independent study must be submitted to the Chancellor’s Honors Program for approval by the third week of the semester. (Note: These honors requirements are course substitutions for the industrial engineering major.)

• Minimum of 3-credit hours of an honors senior design course. This requirement is normally satisfied as part of their senior capstone design course (Industrial Engineering 422).

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

http://www.engr.utk.edu/mse

George M. Pharr, Head

Professors

Benson, R.S., PhD ........................................... Florida State
Bhat, G.S., PhD .................................................. Georgia Tech
Breese, R.R., PhD ........................................... Florida State
Collier, B.J., PhD ................................................ Tennessee
Dahotre, N.B., PhD ........................................... Michigan State
Egami, T., PhD .................................................. Pennsylvania
George, E.P., PhD ........................................... Pennsylvania
Hansen, M.G., PhD ........................................... Wisconsin
Joy, D.C., DPhil ................................................. Oxford (UK)
Liang, P.K., PhD ............................................. Northwestern
Lundin, C.D., PhD ........................................... Rensselaer Polytechnic
McHargue, C.J., PhD ........................................ Kentucky
Neh, T.G., PhD .................................................. Stanford
Pedraza, A.J., PhD ........................................... LaPlata (Argentina)
Pharr, G.M., PhD, PE .......................................... Stanford
Simpson, M.L., PhD ........................................... Tennessee
Spruiell, J.E., PhD ........................................... Tennessee
Wadsworth, L.C., PhD ......................................... North Carolina State

Associate Professors

Kit, K., PhD ...................................................... Delaware
Meek, T.T., PhD .............................................. Ohio State
Morris, J.R., PhD .............................................. Cornell
Rack, P.D., PhD ............................................... Florida

Assistant Professors

Choo, H., PhD .................................................. Illinois Institute of Technology
Gao, Y., PhD .................................................... Princeton
He, W., PhD ..................................................... Connecticut
Hu, B., PhD ...................................................... Chinese Academy of Sciences
Keppens, V., PhD ............................................ Katholieke Universiteit Leuven (Belgium)
Rawn, C.J., PhD .............................................. Arizona
Wang, S., PhD .................................................. Akron

Emeriti Faculty

Brooks, C.R., PhD ........................................... Tennessee
Fellers, J.F., PhD .............................................. Akron

Materials science and engineering is concerned with the science and technology needed to develop and apply materials for the benefit of society. The undergraduate program is designed to prepare students to undertake materials science and engineering careers or to enter graduate programs in this or related disciplines. The following specific educational objectives were established in consultation with our students, faculty, potential employers, and alumni to assure that students are well prepared to undertake careers or graduate programs and that our students graduate with an undergraduate education that will sustain them for their lifetime.

During the initial stages of their careers, graduates will be prepared to

• Apply knowledge of the fundamentals of physical and chemical sciences, mathematics, and engineering sciences in the practice of materials science and engineering or in advanced professional studies.

• Design components, systems, or processes and/or select materials for specific applications with consideration of economic, safety, environmental, and social issues.

• Apply professional skills in such areas as communication, problem solving, and experience in working in diverse teams, to the practice of materials engineering in contemporary and global environs.

• Use the general education component of their education for the appreciation of cultural and social values, for understanding the impact of engineering solutions on society, and for personal development.

These educational objectives are consistent with the mission statement of the university. They particularly relate to "commitment to the development of individuals and society as a whole through the cultivation and enrichment of the human mind and
The field of materials science and engineering is quite broad, encompassing metallic, ceramic, and polymeric materials, as well as composites made from combinations of materials and specialty applications areas such as electronic and optical materials. Consequently, the curriculum contains a central core of courses that are applicable to all materials types with flexibility in the upper division years to permit concentration and in-depth coverage of specific materials categories. By judicious choice of electives the student may get a broad perspective or may develop a specialty area.

A minimum of 18 semester-hours of general education coursework are required by all engineering degree programs in order to meet the University of Tennessee, Knoxville, General Education goals. (See The University General Education Requirement section in the front of this catalog). The major in materials science and engineering specifically requires Economics 201 (taken as one of the two courses required in the Social Sciences cluster); any two approved courses under the Arts or Humanities cluster; and any two approved courses under the Cultures and Civilizations cluster. The requirement for three courses in writing communication may be filled by English 101 and 102 plus Materials Science and Engineering 405 (or other approved writing intensive course). The requirement for one course in communicating orally may be filled with Materials Science and Engineering 489 (or other approved communicating orally course).

Graduation in materials science and engineering requires a minimum grade point average of 2.00 for all departmental courses.

Progression to Upper-Division Programs

Progression of students to departmental upper-division coursework is competitive. Factors considered include overall grade point average, performance in selected lower-division courses and evidence of satisfactory and orderly progress through the prescribed curriculum.

Upper-Division Status

A lower-division student formally applies for upper-division status after completing 50 hours of lower-division engineering curriculum coursework with an overall GPA of at least 2.40. This must include Materials Science and Engineering 201.

Provisional Status

Students who have completed 50 hours of lower-division engineering curriculum coursework with an overall GPA between 2.00 and 2.40 may apply for provisional status. The granting of provisional upper-division status is based on the availability of space in the departmental programs after upper-division status students have been accommodated. Provisional students are required to demonstrate their ability to perform satisfactorily in upper-division courses by attaining a minimum GPA of 2.00 in at least 8 hours of 300-level required courses specified by the department. Further progression to upper-division courses is dependent upon this minimum level of performance.

Transfer Students

At the upper-division level students are admitted on a provisional status basis only. Any student presenting more than 28 hours of lower-division engineering curriculum coursework by transfer credit is considered to be a transfer student.

### MATERIALS SCIENCE AND ENGINEERING MAJOR

#### Requirements for the Bachelor of Science in Materials Science and Engineering

<table>
<thead>
<tr>
<th>Year</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Materials Science and Engineering 101</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><em>English 101</em> or 118, 102</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemistry 120* or 128, 130* or 138</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Mathematics 141* or 147*, 142* or 148*</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Engineering Fundamentals 105, 151 or 157, 152 or 158</td>
<td>9</td>
</tr>
</tbody>
</table>

#### Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Science and Engineering 201, 250, 260, 290, 291</td>
<td></td>
</tr>
<tr>
<td>Physics 231*, 232*</td>
<td>0.7</td>
</tr>
<tr>
<td>Mathematics 200, 231, 241 or 247</td>
<td>0.8</td>
</tr>
<tr>
<td>2General Education Electives (Social Sciences)</td>
<td>0.6</td>
</tr>
</tbody>
</table>

#### Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Science and Engineering 300, 302, 304, 320, 340, 360, 370, 390</td>
<td>0.23</td>
</tr>
<tr>
<td>Statistics 251</td>
<td>0.3</td>
</tr>
<tr>
<td>2General Education Electives (Arts and Humanities)</td>
<td>0.3</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>0.3</td>
</tr>
</tbody>
</table>

#### Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Science and Engineering 405*(WC), 480, 489*(OC)</td>
<td>0.10</td>
</tr>
<tr>
<td>3Materials Science and Engineering Elective</td>
<td>0.6</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 301</td>
<td>0.3</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>0.3</td>
</tr>
<tr>
<td>2General Education Electives (Cultures and Civilizations, Arts and Humanities)</td>
<td>0.9</td>
</tr>
</tbody>
</table>

**Total 128**

* Meets General Education Requirements.

1 Students receiving a grade of A or B in English 118 will complete their freshman English requirement by choosing English 102, a sophomore literature course in the English Department, or English 355.

2 General Education courses must include Economics 201 or 207, any two approved courses under the Arts or Humanities cluster, any two approved courses under the Cultures and Civilizations cluster, and one approved course in the Social Sciences cluster.


**HONORS CONCENTRATIONS**

Students who wish to pursue the honors materials science and engineering concentration or the honors biomaterials concentration will normally be part of the Chancellor’s Honors Program. Candidates for these honors concentrations must complete the following requirements.

- **First-year courses for honors concentration in the engineering majors**
- **Two upper-division honors courses in Materials Science and Engineering via Honors-by-Contract or Honors Independent Study. The contract or independent study must be submitted to the Chancellor’s Honors Program for approval by the third week of the semester. (Note: These honors requirements are course substitutions for the materials science and engineering major.)**
- A minimum of 3-credit hours of an honors senior design course. This requirement is normally satisfied as part of their senior capstone design course (Materials Science and Engineering 489).

**BIOMATERIALS CONCENTRATION**

In addition to satisfying the requirements described the materials science and engineering major, candidates for biomaterials concentration must also satisfy the following stipulations.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology 140(4) or Biochemistry and Cellular Molecular Biology 230(5)</td>
<td>4.5</td>
</tr>
<tr>
<td>One of: Materials Science and Engineering 470, 485; Biomedical Engineering 409, 473</td>
<td>0.3</td>
</tr>
</tbody>
</table>

**Total 10-11**
Minor in Materials Science and Engineering

A minor in materials science and engineering is offered through the College of Engineering to those undergraduate students who have met the prerequisites for the courses required by the minor. The minor requires completion of a minimum of 18 hours in coursework which develops a foundation in materials science and engineering and allows concentration in materials science and engineering areas to be selected by the students (e.g., metallurgy, polymers, ceramics, composites, or electronic materials). Some of the courses used for the materials science and engineering minor may also satisfy requirements for the student’s major.

Students may enroll in the minor program by completing a form at the Department of Materials Science and Engineering, 434 Dougherty Engineering Building. A copy of the completed enrollment form and information on the minor requirements will be forwarded to the student’s home department advisor.

Required Courses                  Hours Credit
Materials Science and Engineering 201 and 480 6
Choose at least one: Materials Science and Engineering 320, 340, 360, 402, 410, and 472 3
Select at least three, at least one of which must be at the 400-level — any of the Materials Science and Engineering 300-400 courses; Biomedical Engineering 310, 408, 455, 469, 473 and 475; Chemistry 350, 360, 369, 430, 439, 450, 473, 483, 497, 498 and 490; Chemical Engineering 230, 301, 447 and 484; Civil and Environmental Engineering 321 and 421; Electrical and Computer Engineering 335; Industrial Engineering 330, 401, and 484; Mechanical Engineering 321, 366, 466 and 484; Nuclear Engineering 484; Physics 342, 411, 412, 421, 431 and 432. Other courses in this category may be acceptable, but must be approved in advance by the Department of Materials Science and Engineering. 9

Total 18

DEPARTMENT OF MECHANICAL, AEROSPACE, AND BIOMEDICAL ENGINEERING

http://www.engr.utk.edu/mabe/

William R. Hamel, Head

Professors

Armitilla, R.V., PhD ... Virginia Tech
Baker, A.J, PhD, PE ... New York
Dareing, D.W., PhD, PE ... Illinois
Frankel, J.I., PhD ... Virginia Tech
Hamel, W.R., PhD ... Tennessee
Keyhani, M., PhD ... Ohio State
Kihm, K.D., PhD ... Stanford
Komistek, R.D., PhD ... Memphis
Landes, J.D., PhD, PE ... Lehigh
Parang, M. (Associate Dean), PhD, PE ... Oklahoma
Parsons, J.R., PhD, PE ... North Carolina State
Smith, G.V., PhD, PE ... Penn State
Sollman, O., PhD, PE ... Tennessee

Associate Professors

Beutel, J.A., PhD ... Stanford
Chellaboina, V.S., PhD ... Georgia Tech
Lin, C.X., PhD ... Chongqing (People's Republic of China)
Lyne, J.E., MD, PhD ... North Carolina State
Madhukar, M.S., PhD ... Drexel
Nguyen, K., PhD ... Colorado
Pionke, C.D., PhD, PE ... Georgia Tech

Assistant Professors

DeSimidt, H.A., PhD ... Penn State
He, W., PhD ... Connecticut
Lee, D., PhD ... Minnesota
Mahfouz, M.R., PhD ... Colorado School of Mines
Zhang, M., PhD ... Washington (St. Louis)
Zhao, X., PhD ... Virginia Tech

Emeriti Faculty

Carley, T.G., PhD, PE ... Illinois
Forrester, J.H., PhD, PE ... Iowa State

Hodges, J., PhD, PE ... Georgia Tech
Johnson, W.S., PhD, PE ... Clemson
Mathews, A., PhD, PE ... Illinois
Milligan, M.W., PhD, PE ... Tennessee
Shannon, T.E., PhD, PE ... Tennessee
Snyder, W.T., PhD ... Northwestern
Wasserman, J.F., PhD, PE ... Cincinnati

The department offers a Bachelor of Science in Mechanical Engineering, Aerospace Engineering, and Biomedical Engineering. The mission of the department is to provide a broad base integration of courses and experiences that prepare graduates to practice their profession successfully, to apply their skills to solve current engineering problems collaboratively, and to help advance the knowledge and engineering practice in their fields.

Progression

The first two years of the curriculum are considered to be lower-division and the two remaining years upper-division. Students must apply for progression to departmental upper division courses, which depends on academic performance. Factors considered include overall grade point average, performance in selected lower division courses and evidence of orderly progression through the prescribed curriculum.

Full Status

A lower-division student may apply for progression to upper division after completing Chemistry 120, Engineering Fundamentals 202, Mathematics 231, Mechanical Engineering 231 and 321, and Physics 231, with a grade of C or better in each, and an overall GPA of at least 2.40.

Provisional Status

Students who have completed Chemistry 120, Engineering Fundamentals 202, Mathematics 231, Mechanical Engineering 231 and 321, and Physics 231 with a grade of C or better and have an overall GPA between 2.00 and 2.40 may apply for provisional status. The granting of provisional status is based on the availability of space in departmental programs after full status students have been accommodated. Provisional status students are required to demonstrate their ability to perform satisfactorily in upper-division by attaining a minimum GPA of 2.00 in the first 12 hours of 300-level required engineering courses. Award of upper-division full status is dependent upon this performance. Students with an overall GPA less than 2.00 will not be admitted to upper-division. Students who have not progressed to upper-division will be dropped from departmental class rolls.

Transfer Students

Students transferring more than 26 hours from another institution are considered transfer students. Transfer students must meet the same criteria as non-transfer students, using transfer grades for acceptable substitutions.

Loss of Full Status

Full status students are expected to maintain an overall GPA of 2.00 and a GPA of 2.00 in departmental courses. Failure to maintain these levels of performance will result in a review of the student’s progress and possible loss of full status.

Graduation Requirements

A minimum cumulative GPA of 2.00 in all departmental courses taken at the University of Tennessee, Knoxville, is required for graduation. This is in addition to the university's graduation requirements.

FIVE-YEAR BS-MS PROGRAM

The department offers a 5-year BS-MS program for qualified students. The primary component of the program is that qualified students may take up to 9 hours of approved graduate courses for their senior undergraduate electives and have them count toward both their bachelor’s and master’s degrees. Significant components of the program are:

- Students must have an overall GPA of at least 3.4 to be admitted to the program. Conditional admission may be
granted after completing 64 hours of required coursework while full admission is granted after completing 96 hours of required coursework with a minimum overall GPA of 3.4 in required coursework.

- Students must at least have conditional admission before taking graduate courses for both their bachelor’s and master’s degrees. All courses taken for graduate credit must be approved by the chair of the program and the Graduate School.
- Admission of students into this program must be approved by the department, the College of Engineering, and the Graduate School.
- Students will not be eligible for assistantships until they complete their bachelor’s degree.

This program may also be used by students entering our doctoral programs directly after receiving their bachelor’s degree.

**AEROSPACE ENGINEERING MAJOR**

Aerospace engineering uses the basic sciences and mathematics to develop the foundation for the design, development, production, testing, and applied research associated with aerospace vehicles. These vehicles include aircraft, spacecraft, and missiles. Auxiliary and propulsion systems are also an integral part of this education. These include guidance, control, environmental, ramjet, rocket, turbojet, and piston engine systems. Emphasis in the senior year is directed toward these topics, and the program culminates in a major aerospace design project.

The educational objectives of the aerospace engineering program are

- To provide students with a comprehensive education that includes in-depth instruction in aerodynamics, structures, flight mechanics, orbital mechanics, flight propulsion, and the design of aerospace systems.
- To prepare students for professional careers in aerospace engineering by developing the skills pertinent to problem solving, analysis, design, and those personal skills required for teamwork and effective communication.
- To provide opportunities to develop and cultivate life-long learning skills, individual professionalism and ethics.
- To prepare some students for graduate study at major universities limited by student desire and their mental ability and agility.

**Requirements for the Bachelor of Science in Aerospace Engineering**

<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours/Semester</th>
<th>Credit</th>
</tr>
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<tbody>
<tr>
<td>Mathematics 101* or 118*, 102</td>
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<tr>
<td>Chemistry 120* or 128*</td>
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<tr>
<td>Mathematics 141* or 147*, 142* or 148*</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Engineering Fundamentals 105, 151 or 157, 152 or 158</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Mechanical Engineering 202</td>
<td>2</td>
<td></td>
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<tr>
<td>Social Sciences Elective*</td>
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</tr>
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<table>
<thead>
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<th>Hours/Semester</th>
<th>Credit</th>
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<tbody>
<tr>
<td>Mathematics 200, 231, 241 or 247</td>
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<td>Physics 231*, 232*</td>
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<td>Mechanical Engineering 231, 321, 391</td>
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<tr>
<td>Materials Science and Engineering 201</td>
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<tr>
<td>Engineering Fundamentals 230</td>
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<td>Economics 201* or 207*</td>
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<td>Social Sciences Elective*</td>
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<th>Hours/Semester</th>
<th>Credit</th>
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<td>Aerospace Engineering 410*, 422, 424, 425, 426, 429, 449</td>
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<tr>
<td>Social Sciences Elective*</td>
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<td></td>
</tr>
</tbody>
</table>

**Total** 128

* Meets University General Education Requirement.

1 Students receiving a grade of A or B in English 118 will complete their freshman English requirement by choosing English 102, a sophomore literature course in the English Department, or English 355.

2 Choose from the University General Education list.

**HONORS AEROSPACE ENGINEERING CONCENTRATION**

In addition to satisfying the requirements for the aerospace engineering major, candidates for the honors aerospace engineering concentration must also complete the following requirements.

- First-year courses for honors concentrations in the engineering majors. (Note: Most of the honors requirements are course substitutions for the aerospace engineering major.)
- Two upper-division honors courses in aerospace engineering via Honors-by-Contract or Honors Independent study. The contract or independent study must be submitted to the Chancellor’s Honors Program by the third week of the semester.
- A minimum of 3-credit hours of an honors senior design course. This requirement is normally satisfied as part of the senior capstone design course (Aerospace Engineering 429).

**Minor in Aerospace Engineering**

The College of Engineering offers a minor in aerospace engineering to those undergraduate students whose academic history provides the prerequisites for the courses required by the minor. The minor requires the completion of a minimum of 18 credits. Some of the courses used in the minor may also satisfy requirements for the student’s major. The grade in each of the aerospace engineering courses must be at least C.

Students may enroll in the minor program by completing a form at the Department of Mechanical, Aerospace and Biomedical Engineering, 414 Dougherty Engineering Building. A copy of the completed enrollment form and information on the minor requirements will be forwarded to the student’s home department advisor.

**Required Courses**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td>Aerospace Engineering 351, 363, 370, 422, 424, 425</td>
<td>18</td>
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</table>

**BIOMEDICAL ENGINEERING MAJOR**

The biomedical engineering curriculum integrates selected engineering sciences and design methods with life science coursework. The program prepares students for careers in a variety of health care related professions including work for medical device manufacturers and regulatory governmental agencies. The course content of the biomedical engineering curriculum complements the departmental strengths in mechanical engineering and includes a comprehensive coverage of engineering materials and biomechanics applications. Elective courses are available to allow students to specialize their curriculum to areas of particular current interest in the marketplace such as cellular and tissue engineering applications. The biomedical engineering program also allows students to meet medical school admission requirements with an appropriate selection of technical electives.

The educational objectives of the biomedical engineering program are

- To provide students with a solid foundation in mathematics, the basic and engineering sciences and engineering design methods.
- To provide students with a comprehensive integration of engineering methods of problem-solving and design with the biological sciences.
- To develop the skills needed for work in the medical device industry including a thorough coverage of engineering materials, biomaterials, biomechanics, medical device design, and work in interdisciplinary teams.
• To provide essential laboratory experience with commonly used biomedical devices and systems and to provide coverage of methods for the design of experiments in medical and life science applications.

• To provide a biomedical technology-based engineering background for students desiring admission to medical school with admission requirements being met through the appropriate selection of elective coursework.

Requirements for the Bachelor of Science in Biomedical Engineering

First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
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<tbody>
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Second Year

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<th>Hours Credit</th>
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<td>Physics 231*, 232*</td>
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<tr>
<td>Mechanical Engineering 231, 321</td>
<td>.6</td>
</tr>
<tr>
<td>Biochemistry and Cellular and Molecular Biology 230</td>
<td>.5</td>
</tr>
<tr>
<td>2Cultures and Civilizations Elective*</td>
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<tr>
<td>Biomedical Engineering 271</td>
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<td>Statistics 251</td>
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Third Year

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<td>Biomedical Engineering 345, 363</td>
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<tr>
<td>Mechanical Engineering 331</td>
<td>.3</td>
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<tr>
<td>Philosophy 241*</td>
<td>.3</td>
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<tr>
<td>Economics 201* or 207*</td>
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Fourth Year

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<td>Engineering Fundamentals 402</td>
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<td>Biomedical Engineering 410*, 430, 455, 469, 473</td>
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<td>3Departmental elective</td>
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<td>2Arts and Humanities Elective*</td>
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<tr>
<td>2Social Sciences elective*</td>
<td>.3</td>
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</tbody>
</table>

Total 128

* Meets University General Education Requirement.
1 Students receiving a grade of A or B in English 118 will complete their freshman English requirement by choosing English 102, a sophomore literature course in the English Department, or English 355.
2 Choose any course from the University General Education list.
3 Departmental and technical electives must be pre-approved by the advisor and department head.

HONORS BIOMEDICAL ENGINEERING CONCENTRATION

In addition to satisfying the requirements for the biomedical engineering major, candidates for the honors concentration must also complete the following requirements:

• First-year courses for honors concentrations in the engineering majors. (Note: Most of the honors requirements are course substitutions for the biomedical engineering major.)

• Two upper-division honors courses in biomedical engineering via Honors-by-Contract or Honors Independent Study. The contract or independent study must be submitted to the Chancellor’s Honors Program by the third week of the semester.

• A minimum of 3-credit hours of an honors senior design course. This requirement is normally satisfied as part of the senior capstone design course (Biomedical Engineering 469).

Minor in Biomedical Engineering

The College of Engineering offers a minor in biomedical engineering to those undergraduate students whose academic history provides the prerequisites for the courses required by the minor. The minor requires the completion of a minimum of 30 credits. Some of the courses used in the minor may also satisfy requirements for the student’s major.

Students may enroll in the minor program by completing a form at the Department of Mechanical, Aerospace and Biomedical Engineering, 414 Dougherty Engineering Building. A copy of the completed enrollment form and information on the minor requirements will be forwarded to the student’s home department advisor.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
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</thead>
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<tr>
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<td>Materials Science and Engineering 201</td>
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<tr>
<td>Electrical and Computer Engineering 301</td>
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<tr>
<td>Mechanical Engineering 331</td>
<td>.3</td>
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<tr>
<td>Biomedical Engineering 271, 300, 310, 430</td>
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</tr>
<tr>
<td>Select one from Biomedical Engineering 473, 475 or Other approved 400- or 500-level Biomedical Engineering course</td>
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Total 30

MECHANICAL ENGINEERING MAJOR

Mechanical engineering involves the design, analysis, testing, and manufacture of mechanical and thermal systems. Mechanical engineers are employed in nearly every industry, from basic research through mass production of energy systems, computer software/hardware, robotics, and automobiles.

Mechanical engineering is a versatile and broadly based engineering discipline that also provides pathways into many exciting fields of specialization. Its foundation is in the basic sciences, but mechanical engineers must further understand such subject areas as mechanical design, solid and fluid mechanics, thermodynamics, heat transfer, vibrations, manufacturing processes, instrumentation and automatic control. Design projects throughout the curriculum develop student skills in handling practical real-world problems. Because of the broad engineering foundation and design training in this program, graduates are found in nearly every industry and at different levels of research, design, and management.

The educational objectives of the mechanical engineering program are

• To educate students thoroughly in methods of analysis, including mathematical and computational skills appropriate for application to engineering problems.

• To develop the skills pertinent to the design process, including skills needed for formulation of problems, analysis, synthesis, and skills pertinent to effective communication and collaborative work.

• To teach students to use modern experimental and data analysis techniques for engineering application.

• To prepare students for lifelong learning, nourish creative talents, and provide understanding of professional and ethical responsibilities.

Requirements for the Bachelor of Science in Mechanical Engineering

First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1English 101* or 118*, 102</td>
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<tr>
<td>Chemistry 120* or 128*</td>
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<td>Engineering Fundamentals 105, 151 or 157, 152 or 158</td>
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<td>Mechanical Engineering 202</td>
<td>.2</td>
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<td>2Cultures and Civilizations Elective*</td>
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Second Year

<table>
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<tr>
<th>Course</th>
<th>Hours Credit</th>
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<tbody>
<tr>
<td>Mathematics 231, 241 or 247, 251 or 257</td>
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<td>Physics 231*</td>
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<tr>
<td>Economics 201* or 207*</td>
<td>.4</td>
</tr>
<tr>
<td>2Cultures and Civilizations Elective*</td>
<td>.3</td>
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</tbody>
</table>
Third Year
Mechanical Engineering 331, 344, 345, 363, 366, 466 ............ 18
Electrical and Computer Engineering 301 .......................... 3
\(^{3,4}\)Department Elective .......................... 3
Aerospace Engineering 341 .................................. 3
Philosophy 241* .................................. 3

Fourth Year
Mechanical Engineering 410*, 475, 449, 450, 460 ............ 13
Engineering Fundamentals 402 .......................... 1
Mechanical Engineering 365 or 463 ......................... 3
\(^{4}\)Technical Elective .................................. 3
\(^{3,4}\)Departmental Electives .......................... 6
\(^{2}\)Social Sciences Elective* .................................. 3
\(^{2}\)Arts and Humanities Elective* .......................... 3

**Total 128**


\(^*\) Meets University General Education Requirement.
\(^1\) Students receiving a grade of A or B in English 118 will complete their freshman English requirement by choosing English 102, a sophomore literature course in the English Department, or English 355.
\(^2\) Choose any course from the University General Education list.
\(^3\) Must be chosen from Aerospace Engineering 351, 363, 422, 425; Mechanical Engineering 365, 406, 451,452, 457, 463, 467, 480 or other departmentally approved course.
\(^4\) All departmental and technical electives must be pre-approved by the advisor and department head.

**HONORS MECHANICAL ENGINEERING CONCENTRATION**

In addition to satisfying the requirements for the mechanical engineering major, candidates for the honors mechanical engineering concentration must also complete the following requirements.

- First-year courses for honors concentrations in the engineering majors. (Note: Most of the honors requirements are course substitutions for the mechanical engineering major.)
- Two upper-division honors courses in mechanical engineering via Honors-by-Contract or Honors Independent study. The contract or independent study must be submitted to the Chancellor’s Honors Program by the third week of the semester.
- A minimum of 3-credit hours of an honors senior design course. This requirement is normally satisfied as part of the senior capstone design course (Mechanical Engineering 460).

**Minor in Mechanical Engineering**

The College of Engineering offers a minor in mechanical engineering to those undergraduate students whose academic history provides the prerequisites for the courses required by the minor. The minor requires the completion of a minimum of 21 credits. Some of the courses used in the minor may also satisfy requirements for the student's major.

Students may enroll in the minor program by completing a form at the Department of Mechanical, Aerospace and Biomedical Engineering, 414 Dougherty Engineering Building. A copy of the completed enrollment form and information on the requirements for the student’s major.

**Required Courses**
Mechanical Engineering 344, 345, 363 and 466 .......................... 12
Select one from Biomedical Engineering 310, 365, 463 .......................... 3
Select one from Aerospace Engineering 449, 450, 469, 467 .......................... 3

**Total 21**

**DEPARTMENT OF NUCLEAR ENGINEERING**

www.engr.utk.edu/nuclear

H.L. Dodds, Head

**Professors**
Dodds, H.L. (IBM Professor), PhD, PE................................ Tennessee
Fontana, M.H. (Research), PhD, PE................................ California (Berkeley)
Ganapolu, B.D. (Research), PhD ................................... Illinios
Hines, J.W., MBA, PhD ............................................ Ohio State
Mihalczko, J.T. (Research), PhD ................................... Tennessee
Miller, L.F., PhD, PE ........................................ Texas A&M
Mynatt, F.R. (Research), PhD ...................................... Tennessee
Pettingill, H.J. (Research), PhD ...................................... Michigan
Ruggles, A.E., PhD .............................................. Rensselaer Polytechnic
Townsend, L.W., PhD ............................................ California (San Diego)
Upadhyaya, B.R., PhD, PE ...................................... California

**Associate Professors**
Cook, D.H., PhD ........................................ Tennessee
Maldonado, G.I., PhD ........................................ North Carolina State
Pevity, R.E., MBA (Emory), PhD, PE ................................ Tennessee

**Assistant Professors**
Gribov, A.V. (Research), PhD ........................................ IPPE (Russia)
Hayward, J.P., PhD ........................................ Michigan
Moussa, H.M. (Research), PhD ...................................... Tennessee
Stephan, A.C. (Research), PhD ...................................... Tennessee

**Adjunct Faculty**
DeHart, M.D., PhD ........................................ Texas A&M
Gehin, J.C., PhD ........................................ Massachusetts Institute of Technology
Icenhour, A.S., PhD ........................................ Tennessee
Nichols, T.L., MD ........................................ Tennessee
Ramsey, C.R., PhD ........................................ Tennessee

**Emeriti Faculty**
Groer, P.G., PhD ........................................ Vienna (Austria)
Uhing, R.E. (Distinguished Professor), PhD, PE ................................ Iowa State

Nuclear engineering is the engineering discipline that focuses on the application of nuclear and atomic processes for the benefit of mankind and the environment. Radiological engineering is a specialty of nuclear engineering that addresses biological applications such as radiation safety (health physics). Some examples of nuclear and radiological engineering are production of electric power with essentially no air pollution, production of isotopes for medical and industrial uses, and development of radiation based methods for the diagnosis and treatment of cancer.

The mission of the Nuclear Engineering Department is to

- Produce high quality nuclear and radiological engineering graduates from undergraduate through the doctoral level in order to help meet the manpower needs of our state, region, nation, and the international community.
- Conduct nuclear and radiological engineering related research to help meet the needs of society.
- Perform service for industry, government, professional organizations, and the public in areas related to nuclear and radiological engineering.

The program for the Bachelor of Science in Nuclear Engineering is nationally accredited by the Accreditation Board for Engineering and Technology (ABET), which is described earlier in this catalog. The educational objectives of the Bachelor of Science program are to

- Provide students with fundamental knowledge in mathematics, computer science, the basic sciences, and the engineering sciences that is necessary to solve state-of-the-art problems in nuclear and radiological engineering.
- Provide students with a real-world design and analysis experience in nuclear and radiological engineering that shall include environmental, societal, safety, and economic considerations.
• Provide students with appropriate skills in oral and written communication, teamwork, laboratory work, problem solving and the use of modern engineering tools that will prepare them to work productively in a contemporary and global environment.

• Provide students with a diverse general education in the humanities, ethics, and social sciences to complement their technological education in order to understand and appreciate the importance of each in society and in personal development.

• Foster a genuine desire for life-long learning in students.

Students majoring in nuclear engineering take courses in the basic sciences, engineering fundamentals, mathematics, computer science, humanities, and special areas of nuclear engineering including nuclear system design and safety; radiation transport and shielding; heat transfer and fluid flow; instrumentation and controls; fuel cycle and waste management; and health physics. Nuclear engineering students may concentrate in radiological engineering by substitution of three courses. The radiological engineering concentration also satisfies most of the requirements of pre-med, pre-vet, and pre-dentistry programs.

**NUCLEAR ENGINEERING MAJOR**

*Requirements for the Bachelor of Science in Nuclear Engineering*

<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours Credit</th>
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<td>Chemistry 120* or 128*, 130* or 138*</td>
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<td>Physics 231*, 232*</td>
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<tbody>
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<td>Social Sciences Elective*</td>
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<tbody>
<tr>
<td>Cultures and Civilizations Elective*</td>
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<td>Mechanical Engineering 321</td>
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<tr>
<td>Philosophy 241*, 243*, or 244*</td>
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<td>Technical Elective</td>
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* Total 126

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<tr>
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<td>Engineering Fundamentals 105, 151 or 157, 152 or 158</td>
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<td>Mathematics 141*, 142*</td>
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<td>Physics 231*, 232*</td>
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<td>Physics 341</td>
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<td>Social Sciences Elective*</td>
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<td>Engineering Fundamentals 402</td>
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<td>Mechanical Engineering 321</td>
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<tr>
<td>Nuclear Engineering 400*, 403*, 406, 472</td>
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<tr>
<td>Philosophy 241*, 243*, or 244*</td>
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<td>Statistics 251, Biochemistry and Cellular and Molecular Biology 310, or Chemistry 350</td>
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</table>

* Total 129

* Meets University General Education Requirement.

1 Technical electives are selected from upper-division mathematics, chemistry, physics, and engineering courses and must be pre-approved by the department. Pre-medical, pre-veterinary, and pre-dentistry students must also take Chemistry 360 and Chemistry 369.

**HONORS RADIOLOGICAL ENGINEERING CONCENTRATION**

In addition to satisfying the requirements described for the nuclear engineering major (radiological engineering concentration), candidates for the honors radiological engineering concentration must also complete the following requirements.

• First-year courses for honors concentrations in the engineering majors. (Note: Most of the honors requirements are course substitutions for the nuclear engineering major.)

• Two upper-division honors courses in nuclear engineering via Honors-by-Contract or Honors Independent Study. The contract or independent study must be submitted to the Chancellor’s Honors Program by the third week of the semester.

• A minimum of 3-credit hours of an honors senior design course. This requirement is normally satisfied as part of their senior capstone design course (Nuclear Engineering 472).
College of Nursing

Joan Creasia, Dean
Jan L. Lee, Associate Dean for Academic Affairs
Kenneth Phillips, Associate Dean for Research
Gary Ramsey, Chair of Undergraduate Program
Beth Barret, Director of Student Services

http://nightingale.con.utk.edu/

The College of Nursing at the University of Tennessee, Knoxville, was established in July 1971 in response to a long-recognized and well-established need for nurses prepared at the collegiate level. The undergraduate program combines the unique resources of the University of Tennessee, Knoxville, campus with those of the university’s comprehensive teaching hospital and other health care agencies in a manner that enables both faculty and students to participate fully in all facets of the health care delivery system. The program is accredited by the Commission on Collegiate Nursing Education at One Dupont Circle, NW, Suite 530, Washington, DC 20036, phone (202) 887-6791. The program is also unconditionally approved by the Tennessee Board of Nursing.

The baccalaureate nursing program has as its central foci the person, health, environment, and nursing. General education courses, nursing courses, and electives are organized in a manner designed to promote and develop creative thinking and other cognitive, affective, and psychomotor processes that are essential for effective nursing practice and for full and meaningful involvement as a contributing member of society. A broad base of general education, a thorough study of human behavior, an emphasis on health maintenance, health promotion, and health restoration, and a strong family and community orientation are essential components of baccalaureate education in nursing. By maintaining a high-quality, relevant program that is responsive to the increasing complexity of health care delivery, the ever changing health needs of society, and the changing and expanding role of the nurse, graduates of the program are able to assume beginning leadership positions in nursing in a variety of settings; work collaboratively with other health professionals; function as socially conscious and contributing citizens; and pursue advanced education on either a formal or an informal basis.

The following courses are open to all university students:
- Nursing 351, 400, 402, and 406.

General Requirements

In order to obtain a Bachelor of Science in Nursing degree, students are required to successfully complete eight semesters of full-time study or the equivalent in part-time study, for a total of 123-124 semester hours. One hundred twenty-three (123) hours are required for graduation. The program also accommodates registered nurses who hold associate degrees in nursing or who are graduates of diploma nursing programs. All upper-division courses, with the exception of 351, 400, 402, and 406, are restricted to students who have been approved for progression. (See Progression Policies and Procedures.) Students pursuing the nursing major are expected to take 319 prior to 351.

Nursing Substitutions

Child and Family Studies 210 or Psychology 300; Chemistry 100, 110 or 120, 130; Microbiology 210 or 310 with 319 lab.
Progression Policies and Procedures

Current standards are available from the Director of Student Services, College of Nursing, Room 203. Students, including registered nurses, who are admitted as nursing students in their freshman or sophomore years must apply for progression to the upper division prior to their junior year.

1. During the Spring Semester of the year the student expects to meet all lower-division course requirements, she/he must complete a Petition for Progression form and submit it to the college’s Student Services Office. Applicants for upper division nursing should submit their Petition for Progression with transcripts for all colleges attended no later than January 20. Students will be selected on the basis of (a) cumulative GPA for courses completed; (b) cumulative GPA for required science, social science, math, and English courses; (c) number of course withdrawals and repetitions; (d) grade improvement over time; (e) probability of completing all lower division requirements prior to the following fall; (f) interest in and commitment to nursing; and (g) the availability of space.

2. If a student is selected for progression but then fails to successfully complete all lower division requirements (except for arts and humanities and cultural civilizations electives) prior to the fall semester, the student will not progress and must submit another petition for progression the following year.

3. Registered Nurses must be licensed to practice in Tennessee or in one of the compact states.

4. Prior to enrollment in junior nursing courses, students must successfully complete a criminal background check and specific health requirements.

Grading and Continuation Policies

1. The minimum acceptable grade for all courses in the curriculum is a C.

2. Satisfactory/No Credit grading option is not permitted to meet degree requirements in nursing unless that is the only way the course is offered.

3. No nursing course may be repeated more than once. If a D, F, or NC grade is earned on the second attempt the student will be required to withdraw from the program.

4. Any student who receives a grade of D, F, or NC for more than one nursing course will be required to withdraw from the program even if the previous course for which D or F was awarded has been repeated with a grade of C or higher.

5. If a student receives an Incomplete (I) in a nursing course, the I must be removed prior to enrolling in any course for which the uncompleted course is a prerequisite.

6. For undergraduate nursing students, 75% is the passing average grade in all nursing courses. To pass any clinical course, a student must achieve a minimum 75% weighted average across all examinations in the course, regardless of any other grades earned in other components of the course. If a student fails to achieve the minimum 75% weighted average on course examinations, the final course grade will be either D (67-74) or F (under 67). The following grading scale applies to all undergraduate nursing courses.

   A = 92-100
   B+ = 88-91
   B = 83-87
   C+ = 79-82
   C = 75-78
   D = 67-74
   F = <67

7. If a student’s clinical performance for any nursing course is found to be unsatisfactory, the grade for that course will be an F regardless of any other grades earned in other components of the course. If the unsatisfactory clinical performance is characterized by unethical, unprofessional, or unsafe behavior, behavior that actually or potentially places the client in jeopardy, the student will be required to withdraw from the program.

8. Requirements for competence in cardio-pulmonary resuscitation are included in the Undergraduate Student Handbook.

9. At periodic intervals specified by the faculty, students must take comprehensive examinations designed to predict success on the NCLEX (licensure) examination. Any student scoring less than 850 at the end of the junior year must take a one-hour independent study course during the summer before starting the senior clinical courses. Seniors will have two opportunities to achieve 850 on an exit exam given prior to graduation. A student who does not score 850 on the second exit exam at the end of spring term will be given a grade of Incomplete in 490 (Specialty Preceptorship). The student will be given the opportunity to remediate and take a third exit exam no sooner than six weeks after the second exit exam. If the student does not score 850 on the third exit exam, the student will receive a failing grade for 490 and may be eligible to retake 490 in the fall term. If a failure of 490 is a second failure in the nursing program for this student, then the student is dismissed from the BSN program.

The Bachelor of Science in Nursing program is designed to fulfill the University General Education Requirements. Please see the current catalog for courses acceptable in the arts and humanities and cultures and civilizations categories.

Insurance Requirements

Students must meet specific physical examination and immunization requirements as specified by state law and by the rules and regulations set forth by the various clinical agencies. All students must participate in the university’s group professional liability insurance program. Specific information concerning these requirements will be provided to the students at appropriate times by the nursing faculty and/or the Director of Student Services.

Course Load

The maximum credit hours per semester for which a nursing student may register without special permission is 19.

Requirements for the Bachelor of Science in Nursing

<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours</th>
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<td>English 101*, 102*</td>
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<tr>
<td>Mathematics 125*</td>
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<td>Statistics 201*</td>
<td>. . . . . . .</td>
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<tr>
<td>Chemistry 100*-110* or 120*-130*</td>
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<td>Arts and Humanities*</td>
<td>. . . . . . .</td>
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<tr>
<td>Psychology 110*</td>
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<tr>
<td>Sociology or Anthropology</td>
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<tr>
<td>Biology 101*</td>
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<tr>
<td>Ecology and Evolutionary Biology 240 (Anatomy)</td>
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<tr>
<td>Biochemistry and Cellular and Molecular Biology 230 (Physiology)</td>
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<td>Microbiology 210*</td>
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<td>Nutrition 100*</td>
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<td>Child and Family Studies 210*</td>
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<td>Nursing 201 (Introduction to Nursing)</td>
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<tr>
<th>Fourth Year</th>
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<tr>
<td>Nursing 403*, 404, 406, 421, 451, 452, 461, 471 or 477, 490</td>
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</table>

Total 124
Meets University General Education Requirement. See catalog listing for approved courses in Arts and Humanities (AH) and Cultures and Civilizations (CC).

Transfer students need a total of at least 8 credit hours in anatomy and physiology and may graduate with 123 hours.

NOTE: Students must meet the University General Education Requirement for Communicating Orally by selecting a course with an OC designation.

RN TRACK FOR BACHELOR OF SCIENCE IN NURSING

1. RNs must complete the same non-nursing requirements as other students. They are exempt from the sophomore level 201 Introduction to Nursing course and will be given proficiency credit based on RN status. (Satisfactory/No Credit.)

2. Students will take the NLN ACE examinations prior to starting upper division coursework. If a decision score of 100 is achieved (per section) the student will receive proficiency credit for five of the major clinical nursing courses exclusive of Community Health. Courses for which credit can be obtained in this manner include 361, 403, 404, 461, and 421, and are indicated with a double asterisk. (Satisfactory/No Credit.)

3. All students take the community course 382.

4. RN-BSN students can elect to challenge 333 Health Assessment by taking the NLN Physical Assessment Examination and passing a hands-on lab demonstration of assessment skills. Indicated with an asterisk. (Satisfactory/No Credit.)

5. Proficiency credit can be obtained in several other courses by passing instructor-made exams or preparing other work as specified by the faculty. These course include 319 Pathophysiology of Health Deviations, 351 Pharmacology I, and 406 Pharmacology II (indicated by an asterisk). All proficiency credit not designated as Satisfactory/No Credit carries a letter grade.

6. The entire upper-division nursing curriculum can be completed in one calendar year. Students not enrolled in nursing courses for two consecutive semesters, excluding summer, will be administratively withdrawn from the program. Those seeking reentry must reapply to the College of Nursing. Students accepted for the master’s program can begin part-time graduate level study while in the final semester of the undergraduate program.

Requirements for the RN Track for Bachelor of Science in Nursing

<table>
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<tr>
<th>Hours Credit</th>
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<tbody>
<tr>
<td>201 Introduction to Nursing (proficiency credit for all RNs)</td>
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<td>305 Transition to Professional Nursing</td>
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<tr>
<td>319* Pathophysiology</td>
</tr>
<tr>
<td>333* Health Assessment</td>
</tr>
<tr>
<td>341 Transcultural Nursing</td>
</tr>
<tr>
<td>351* Pharmacology I</td>
</tr>
<tr>
<td>361** Health Maintenance and Restoration: Adult</td>
</tr>
<tr>
<td>382 Health Promotion and Maintenance in Community</td>
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<tr>
<td>403** Health Promotion, Maintenance, and Restoration in Children, Adolescents, and Their Families</td>
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<tr>
<td>404** Health Promotion, Maintenance, and Restoration in Childbearing Families</td>
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<tr>
<td>406* Pharmacology II</td>
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<tr>
<td>421** Health Maintenance and Restoration in Mental Health</td>
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<tr>
<td>454 Professional Leadership Issues (OC)</td>
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<td>461** Health Restoration: Adult</td>
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<td>471 Nursing Research</td>
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<td>494 Alternative Preceptorship (WC)</td>
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Total 123

* Courses may be challenged.
** Courses may receive proficiency credit.

Intercollegiate/Interdisciplinary Minor in Gerontology

An intercollegiate/interdisciplinary undergraduate minor in gerontology is available. See Department of Exercise, Sport, and Leisure Studies in the College of Education, Health, and Human Sciences for required courses.
College of Social Work

Karen M. Sowers, Dean
Matthew T. Theriot, Interim Director

http://www.csw.utk.edu/

Profs.
Cetingok, M., PhD . Washington (St. Louis)
Combs-Orme, T., PhD . Washington (St. Louis)
Glisson, C., PhD . Washington (St. Louis)
Nugent, W., PhD . Florida State
Orme, J., PhD . Washington (St. Louis)
Patterson, D., PhD . Utah
Sowers, K., PhD . Florida State
Wodarski, J., PhD . Washington (St. Louis)

Assoc. Professors
Bolen, R., PhD . Texas (Arlington)
Bowie, S., PhD . Barry
Cummings, S., PhD . Georgia
Dupper, D., PhD . Florida State
Egan, M., PhD . Maryland
Ellis, R., PhD . Florida International
Evans, T., PhD . Minnesota
Faria, G., PhD . Denver
Rocha, C., PhD . Washington (St. Louis)
Rogge, M., PhD . Washington (St. Louis)
Slaudt, M., PhD . Washington (St. Louis)
Sullivan, M., PhD . Georgia

Asst. Professors
Cooper, L., PhD . Louisville
Craun, S., PhD . California (Los Angeles)
Davis, C., PhD . California (Los Angeles)
Hall, C., PhD . Smith
MacMaster, S., PhD . Case Western Reserve
Neely-Barnes, S., PhD . Washington
Strand, E., PhD . Tennessee
Theriot, M., PhD . California (Berkeley)

Research Faculty
Black, B., MSSW . Tennessee
Campbell, P., DSW . Alabama
Green, P., PhD . Tennessee
Hemmelgarn, A., PhD . Tennessee

Field Coordinators
Burcham, S., (Memphis) . Tennessee
Gonzales, S., (Nashville) . Tennessee
Jackson, R., MSSW (Knoxville) . Tennessee
Lodato, G., MSW . Marywood

SOCIAL WORK MAJOR

Social work is a helping profession which focuses on providing skilled intervention in the prevention and amelioration of individual and societal problems. It is a challenging and rewarding career involving the application of knowledge, skills, and professional values to assist individuals, families, groups, and communities in reaching their potential. The primary mission of the undergraduate social work program is to develop generalist social workers who are strategic thinkers, life-long learners, and opinion shapers. It is the purpose of the college to provide an education which enhances individual and career development and fosters involvement on behalf of social and economic justice.

The program prepares students for social work careers in such diverse areas as schools, youth programs, family service agencies, nursing homes, courts, mental health, and welfare agencies. The degree provides graduates a competitive advantage in many jobs, the possibility of up to one year's standing in some master's degree programs in social work, and the potential to be licensed in a number of states throughout the nation.

The social work curriculum builds on a strong liberal arts base. The humanities and the social and behavioral sciences are emphasized to help students understand human diversity and the transactions between people and their environment. The curriculum combines classroom experience and agency-based field placements. Courses provide a knowledge base in social work practice theory, human behavior, social welfare policy, and research. Educationally directed field placements, which consist of over 600 clock hours of supervised field instruction in agency settings throughout greater Knoxville, provide extensive and challenging opportunities for students to apply the lessons of the classroom to the needs of society. The program is accredited by the Council on Social Work Education.

The undergraduate social work program (Bachelor of Science in Social Work) started in 1982 in the College of Liberal Arts. It was granted initial accreditation by the Council on Social Work Education in January 1983, and reaffirmation was given in 1992 and 2001. The program was transferred to the College of Social Work in September 1985. The three programs, Bachelor of Science in Social Work, Master of Science in Social Work, and Doctor of Philosophy, in the college represent the full continuum of social work education.
Facilities
The College of Social Work is housed in Henson Hall, located on the corner of Cumberland Avenue and Volunteer Boulevard on the UT Knoxville campus. This building houses the administrative and faculty offices, along with classrooms for the BSSW, MSSW and PhD programs. Video and computer resources are available to facilitate instruction.

Graduate Program
The College of Social Work offers a fully accredited two-year graduate professional degree at the master’s level (MSSW). The college also offers a graduate program leading to a Doctor of Philosophy in Social Work (PhD). Information concerning graduate programs is given in the College of Social Work Bulletin and also in the Graduate Catalog. Master’s degree programs are offered on the campus in Knoxville and in Nashville and Memphis. The PhD program is offered in Knoxville.

Grading Policy
The Satisfactory/No Credit option is not permitted in the major. The minimum acceptable grade for all social work courses is a C. Courses, other than field, in which a D or F is achieved may be repeated once. Field courses must be completed with a C or better and may not be repeated.

A student receiving a grade of incomplete (I) in any social work course must remove the Incomplete before enrollment in subsequent field practice.

Course Load
The maximum credit hours per semester allowed for any student is 19. Special permission is needed for any overload.

Progression Requirements
Students admitted to the university may request a faculty advisor from the College of Social Work. Prior to enrolling in upper-division social work courses, students in the college must successfully complete Social Work 200 and 250 with a grade of C or better, be in good academic standing, and have fulfilled most lower-division and General Education course requirements. Students in the college are encouraged to participate in community service and/or volunteer activities at a social service agency in advance of upper-division social work coursework. Students are advised that several field placement agencies and licensing boards require successfully passing a criminal background check.

Requirements for the Bachelor of Science in Social Work

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<th>Year</th>
<th>Course</th>
<th>Hours</th>
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<td>Mathematics 113*</td>
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<td>Biology 101, 102*</td>
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<td>Communication Studies 210*</td>
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<td></td>
<td>3Cultures and Civilization (History Sequence)*</td>
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<td>Anthropology 130*</td>
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<td>Mathematics 115*</td>
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<td>Social Work 315, 380</td>
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<td>Child and Family Studies 220*</td>
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<td></td>
<td><strong>Total</strong></td>
<td>21</td>
<td>120</td>
</tr>
</tbody>
</table>

* Meets University General Education Requirement.
1 Students are required to complete a two-course sequence in a foreign language at the intermediate level. Educational Interpreting 223 and 226 will fulfill the foreign language requirement but will not meet the University General Education Requirement.
2 See Arts and Humanities—University General Education Requirement. Select two courses from the list in the Undergraduate Catalog.
3 One of the following sequences may be selected – Africana Studies 235-236; Asian Studies 101-102; History 241-242; History 261-262; Latin American Studies 251-252; Medieval Studies 201-202; Religious Studies 101-102.

Intercollegiate/Interdisciplinary Minor in Gerontology
An intercollegiate/interdisciplinary undergraduate minor in gerontology is available. See Department of Exercise, Sport, and Leisure Studies in the College of Education, Health, and Human Sciences for required courses.
The Chancellor’s Honors Program is the University of Tennessee’s principal honors program, serving 5% of students and representing the majors in all nine of the university’s undergraduate colleges. The Chancellor’s Honors Program is built on four cornerstones: coursework, community, research, and participation in the Ready for the World Initiative. Featuring limited enrollments and dynamic faculty, enhanced and enriched honors coursework is offered by the Chancellor’s Honors Program, as well as by departments across the university. Based in Morrill Hall, the honors living/learning community welcomes first-year, as well as returning, Chancellor’s Honors students, as does the Honors Council, the Chancellor’s Honors Program student government. Chancellor’s Honors students may also benefit from exclusive grants in support of required Senior Projects and required international or intercultural learning. In recognition of their exceptional academic achievement, Chancellor’s Honors students receive special graduation recognitions.

The Chancellor’s Honors Program anchors the University of Tennessee’s uniquely decentralized system of honors programs and opportunities. Chancellor’s Honors students are encouraged to participate in one or more of the University of Tennessee’s many specialized college or departmental honors programs.

Eligibility
The Chancellor’s Honors Program is available to entering freshmen and to qualified transfer and sophomore students. High school seniors with superior academic credentials are encouraged to apply. While there is no required minimum high school GPA or minimum ACT/SAT score, recent entering classes have had an average high school GPA of 4.0 and an average composite ACT of 31.

Transfer students who have earned at least a 3.50 GPA in another honors program are eligible to apply, as are continuing UT students who have earned a minimum GPA of 3.25 on courses taken at UT Knoxville.

Requirements
In addition to required work in their respective colleges, Chancellor’s Honors students complete

- English 118 (required), except for (1) incoming students with a 4 or 5 on the Literature and Composition AP test or with dual-enrollment credit for English 101 and 102, and (2) incoming students with a 4 or 5 on the Language and Composition AP test or with dual-enrollment credit for English 101 (and who must, therefore, enroll in English 102).
- One 1-credit University Honors seminar (University Honors 100).
- One 200-level University Honors seminar to be completed during the second semester of freshman year.
- Four additional 100- or 200-level honors courses selected from University Honors courses or departmental honors offerings.
- Two upper-division honors courses in their major (Honors-by-Contract or Honors Independent Study may be substituted).1
- One 3-credit senior project (University Honors 499 or equivalent approved by CHP).

TOTAL: 25-28 credit hours of honors coursework.

All Chancellor’s Honors students are required to undertake approved international/intercultural learning to fulfill the Chancellor’s Honors Program graduation requirements. The international/intercultural graduation requirement may be fulfilled through participation in an approved study-abroad program, an approved international/intercultural internship, or via the completion of an undergraduate major or minor in a foreign language.

1 Honors-by-Contract: Customized approach in an upper-division course in the student’s academic major, through completion of a written contract delineating additional effort. The contract must be submitted to CHP by the third week of the semester. Honors-by-Contract is available to Chancellor’s Honors students, College Scholars, and students participating in a departmental or college-level honors program at UT Knoxville.
The Haslam Scholars Program is composed as an intimate, four-year enrichment program where elite students learn from and with one another through a series of integrated, interdisciplinary common seminars and extracurricular experiences, including common study abroad. The Haslam Scholars Program seeks a group of students who embrace the program’s emphasis on peer learning, make a commitment to its required four-year course of study, and are excited by the numerous possibilities afforded them to contribute significant forms of leadership and service. Prospective Haslam Scholars will combine exceptional scholarly and intellectual merit with evidence of leadership experience and potential. Maturity and seriousness of purpose, along with evidence of special talents and skills, are among those intangibles essential to the success of an intimate, intensive scholars program.

The Haslam Scholars Program curriculum totals 28 credit hours, and extends from a 1-credit summer program for newly matriculating first-year scholars to a 1-credit senior seminar in the scholar’s final semester. The curriculum serves the Haslam Scholar as the equivalent of the 28 credit hours required of Chancellor’s Honors students and contributes significantly to General Education requirements in every undergraduate degree program. Students in the Haslam Scholars Program must also be members of the Chancellor’s Honors Program.

As with the Chancellor’s Honors Program, no strict grade-point average or test score minimums will be used in the Haslam Scholars Program selection process. It is, however, expected that Haslam Scholars are likely to have earned a truly superior GPA in a rigorous high school curriculum and scored in the top 1% of the national distribution of standardized test scores (e.g., 33+ ACT composite, 1460+ SAT or 2190+ new SAT).

The Haslam Scholars Program curriculum is 28 credit hours in total, composed of two 1-credit hour special seminars and programs in the first year, a minimum of 4 credit hours of honors coursework in the first-year, an exclusive integrated series of three 3-credit hour seminars linked, at their conclusion, to a common 3-credit hour study abroad program, and 6 credit hours of in-depth individual research and its presentation to a 1-credit hour senior colloquium. Haslam Scholars will also engage in three credit hours of common service-learning or executive-level internships.

### Required Courses
- Haslam Scholars Program 195 Summer Leadership Program (1)
- University Honors 100 Chancellor’s Honors First-Year Seminar (1)
- English 118 (3); or AP or dual enrollment credit. See The Chancellor’s Honors description for more detail.
- Haslam Scholars Program 197 Research for Nationally Competitive Scholarships (1)
- Haslam Scholars Program 258 Foundations of Modernity (3) (AH)
- Haslam Scholars Program 268 Perspectives on Globalization (3) (SS)
- Haslam Scholars Program 288 Energy in the Modern World (3) (NS)
- Haslam Scholars Program 348 Service Learning Project/Internship (3)
- Haslam Scholars Program 491 Study Abroad Program (3)
- Haslam Scholars Program 497 Honors Thesis I (3)
- Haslam Scholars Program 498 Honors Thesis II (3)
- Haslam Scholars Program 499 Senior Colloquium (1)

For more information on this program and the application process, please see the Haslam Scholars Program on the Chancellor’s Honors Program Web site (http://honors.utk.edu/).
University Studies

Neil Greenberg, Chair

http://web.utk.edu/~unistudy/

University Studies has three general objectives – to foster interdisciplinary teaching and scholarship, especially across departmental and collegiate boundaries; to promote active and integrative learning; and to nurture the scholarly and creative development of faculty, staff, and students.

In pursuit of these objectives, University Studies sponsors several activities. Faculty colloquies are ongoing, structured, interdisciplinary conversations on a topic or nexus of topics. Colloquies explore important contemporary issues which involve faculty and students from several disciplines and colleges. Advanced undergraduate and graduate students may attend by permission of colloquy coordinator.

Current colloquies include Appalachian Forum; Applied Phenomenological Studies; Creativity Group; Critical Theory; Cultural Diversity; Evolution and Culture; Gerontology; History and Philosophy of Science and Technology; Interdisciplinary Colloquy on Rhetoric; Spiritual and Critical Theory; and Spirituality and Health. Colloquies continue as long as they have faculty involvement and new colloquies form each year.

Interdisciplinary undergraduate courses are innovative offerings that are typically collaborative or team-taught. Most courses stem from the interdisciplinary colloquy discussions. There are several honors offerings for undergraduates. In addition, Chancellor’s Honors students are encouraged to take a university studies (200-level or higher) course during their first two years to help fulfill their honors courses requirement.

Centripetals are monthly faculty and staff luncheons held over the academic year designed to encourage interdisciplinary conversation among faculty and staff about their creative and scholarly work. University Studies also works with other units across campus to facilitate visits by distinguished scholars of multidisciplinary interest. Such visiting scholars work with faculty groups on specific projects, participate in interdisciplinary forums, or present special lectures.

For further information, contact
Dr. Neil Greenberg, Chair
F239 Walters Life Science Building
Phone (865) 974-8177
FAX (865) 974-2665
E-mail unistudy@utk.edu
The whole institution was put under regular United States Military Academy discipline. The student body was organized into a battalion of cadets, which consisted of four companies fully officered, armed and equipped under the command of the commandant and his staff of cadet officers. UT Knoxville remained as a military garrison for a period of six years, until 1877. Military Science continued to be taught since the university was a Land Grant Institution and the 1862 Act of Congress required instruction in military science.

The National Defense Act of 1916 changed the old military organization into an ROTC unit. For the first time, the federal government began to pay a part of the uniform cost for basic course students. The government provided uniforms and other equipment for juniors and seniors, and a monthly subsistence allowance was given to advanced course students.

From 1928-1930, Major (later Brigadier General) Robert R. Neyland was the Professor of Military Science and football coach at the University of Tennessee, Knoxville.

Objectives of the program are to provide students with an understanding of the fundamental concepts and principles of military art and science; to develop a basic understanding of associated professional knowledge; a strong sense of personal integrity, honor, and individual responsibility; an appreciation of the requirements for national security; and to establish a sound basis for the students’ future professional development.

ROTC draws young men and women for training from all geographical, economic, and social strata of our society, as well as from the many educational disciplines required for the modern army. The program ensures that men and women educated in a liberal and broad spectrum of American institutions of higher learning are commissioned annually into the officer corps.

The Program

Basic Course

Students entering the basic course register for classes at the same time and in the same manner as they enroll in their other college courses. All four classes (Military Science and Leadership 101, 102, 201, and 202) are available to any UT Knoxville student as an elective course without any military obligation. Completion of the basic course, graduation from leader’s training course (Military Science and Leadership 200), or prior military service qualifies students for entry into the advanced course, which is normally taken during the last two years of college.

Advanced Course

The advanced course is designed to develop and mentor leaders of character, who, upon degree completion, will accept a commission in the United States Army. The advanced course requirement is that applicants have two academic years remaining at either the undergraduate or graduate levels, or a combination of both. Students normally enter the advanced course during the last two years of their degree program (junior year for undergraduates, first year of master’s program for graduate-
level students). The advanced course is made up of five military science and leadership classes (Military Science and Leadership 301, 302, 400, 401, 402) and takes two years to complete. All classes except Military Science and Leadership 400 are offered during spring/fall semesters. Military Science and Leadership 400 is a paid five-week summer camp held in Seattle, Washington.

Army ROTC develops students under the whole person concept. Cadets must maintain academic standards while taking on the additional responsibilities of ROTC. Army ROTC cadets are required to participate in organized physical fitness training. Students enrolled in the advanced course are required to be full-time students, taking at least 12 hours each semester.

Placement Credit and Course Substitution
Placement credit and/or course substitution may be granted by the Professor of Military Science and Leadership on the basis of previous honorable active military service, participation in a junior ROTC program, completion of Military Science and Leadership 200, or completion of a preparatory course. A student may request placement credit for a portion of the basic course. Military science and leadership courses taken at other colleges or universities are transferable as approved by the Professor of Military Science and Leadership.

Military Science and Leadership 200 is a paid five-week summer leader's training course offered to any University of Tennessee student without any military obligation. Students completing this course receive four academic credits, qualify for the Tennessee student without any military obligation. Students completing this course receive four academic credits, qualify for the advanced course by receiving basic course credit, and can compete for the basic course. The advanced course is made up of five military science and leadership classes (Military Science and Leadership 301, 302, 400, 401, 402) – 30-59.9 hours/2.00 GPA.

Minimum overall GPA for entrance into the advance course (Military Science and Leadership 301, 302, 400, 401, 402) – 2.00 GPA.

Minimum GPA in military science and leadership courses – 3.00.

Minimum overall GPA for commissioning: 2.00.

5. Semester counseling sessions with military advisor required for advance course and scholarship students only.

Requirements for All Military Science and Leadership Commissionees
The following military science and leadership advanced course curriculum must be successfully completed.

1. Basic course students must
   a. Have successfully completed Military Science and Leadership 101, 102, 201, and 202 or have completed one of the following: prior military service, ROTC basic military studies; practicum (Military Science and Leadership 200); three-year high school ROTC basic course.
   b. Have two years remaining at the university (either undergraduate, graduate or in pursuit of additional course work).
   c. Have completed a minimum of 55 hours.
   d. Be under 30 years old at time of graduation and commissioning (waiverable).
   e. Be enrolled as a full-time student, either at the University of Tennessee, Knoxville, or at a nearby institution in a partnership program.
   f. Meet military screening and physical requirements.
   g. Maintain a 2.00 G.P.A.
   h. Maintain B average in military science and leadership courses.

2. Minimum overall GPA for entrance into the advance course (Military Science and Leadership 301, 302, 400, 401, 402) – 2.00 GPA.

3. Minimum GPA in military science and leadership courses – 3.00.

4. Minimum overall GPA for commissioning: 2.00.

Special Programs
Pay and Entitlements
All scholarship cadets and cadets enrolled in the ROTC advanced course receive uniforms and equipment plus a monthly allowance during the academic year. While attending the ROTC summer studies each cadet receives approximately $740 for basic summer studies, $740 for advanced summer studies, $740 for basic summer studies, plus meals and clothing are provided.

Army ROTC Scholarship Program
The Army ROTC scholarship program offers financial assistance to outstanding young men and women in Army ROTC who are interested in the Army as a career. Each scholarship provides for free tuition, textbooks subsidy, and laboratory fees in addition to a monthly subsistence allowance for the period that the scholarship is in effect. The monthly stipend runs from $300 to $500 for contracted cadets. Scholarships may be awarded for either two, three or four years. High school seniors should contact their guidance counselors early in August or September of their senior year to apply for the four-year scholarship. Two- and three-year scholarship applicants should contact the Professor of Military Science and Leadership for further information. Other privately financed scholarships and grants are also available to ROTC cadets.

Leadership Grant Program
The University of Tennessee, Knoxville, ROTC Leadership Grants are designed to attract and retain high quality/caliber students to the Army ROTC program for future positions of leadership within their service and our country. These grants are intended to complement other ROTC and university scholarships by providing funds to offset costs for such areas as room and board, out-of-state tuition, and first year expenses for Army ROTC scholarship winners.

Up to ten $1,000 leadership grants are available each year and are available to scholarship winners and any full-time student enrolled in the AROTC program. Awarding of these leadership grants will be determined by the Professor of Military Science and Leadership who will evaluate each candidate in the following areas – ACT/SAT scores; leadership activities; and recommendations from high school personnel and community leaders.
Simultaneous Membership Program

The simultaneous membership program option combines the Army ROTC living allowance with membership in the Army Reserve or Army National Guard and allows the student to receive pay from both programs. ROTC cadets serve as officer-trainees in direct leadership/management positions. Simultaneous membership program participation with national guard or reserve forces is one weekend per month and two weeks each year. Cadets participating in the simultaneous membership program are eligible for tuition assistance reimbursement up to $4,500 per year.

Branch Selection

The curriculum of the Army ROTC program is designed to qualify the cadet for appointment as an officer. Selection for assignment to the various branches of the army is based upon the personal interests of the cadet, the major course of study, academic accomplishments, leadership potential, and the needs of the service. Under this system a cadet may be commissioned in any branch for which he or she is qualified and in which a need for officers exists. After graduation and commissioning, the officer will attend a service school for further specialized military training which will qualify him or her for the branch to which he or she is assigned.

Extra Curricular Activities

Numerous military related activities are available to cadets throughout the school year. These include the Tennessee Rangers, Scabbard and Blade Honor Society, and UT Color Guard. These organizations provide both student-to-student contact and a valuable opportunity to acquire military skills. Additionally, each semester, a number of field training exercises are conducted to develop such military skills as small unit tactics, land navigation and rifle marksmanship.

Physical Fitness Training

The Cadet Battalion conducts physical fitness training Monday, Wednesday, and Friday. The exercise program focuses on flexibility, muscular strength, and cardiorespiratory endurance. Any University of Tennessee, Knoxville, student may take the course by registering for Army ROTC Fitness Program 103.

Military Science and Leadership Curriculum

Normal Course

<table>
<thead>
<tr>
<th>First Year</th>
<th>Hours Credit</th>
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<tbody>
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<tr>
<td>Military Science and Leadership 103</td>
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<td>Military Science and Leadership 301, 302</td>
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</tr>
<tr>
<td>Military Science and Leadership 103</td>
<td>1</td>
</tr>
<tr>
<td>Fourth Year</td>
<td></td>
</tr>
<tr>
<td>Military Science and Leadership 401, 402, 430, 303</td>
<td>11</td>
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<tr>
<td>Military Science and Leadership 103</td>
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Military Studies – Practicum

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</thead>
<tbody>
<tr>
<td>Second Year</td>
<td></td>
</tr>
<tr>
<td>Military Science and Leadership 200</td>
<td>4</td>
</tr>
<tr>
<td>Third Year</td>
<td></td>
</tr>
<tr>
<td>Military Science and Leadership 400</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

The Professor of Military Science and Leadership may approve variations to these sequences of study on a case-by-case basis. Lower-division credit hours granted by the university for military service are dependent upon time spent in service and service schools attended.

DEPARTMENT OF AIR FORCE

http://web.utk.edu/~rotc800/

Air Force ROTC Program

Professor of Air Force Aerospace Studies
Lt. Colonel Michael S. Angle, MBA

Purpose

The Air Force Reserve Officers Training Corps (AFROTC) is an educational program designed to provide the college student an opportunity to earn an Air Force commission as a second lieutenant while completing the university requirements for a bachelor's degree. The program provides education that will develop the skills and attitudes vital to the professional Air Force officer. Upon successful completion of the program and graduation from the university, students are commissioned as second lieutenants and enter active duty.

Four-Year Program

Students entering the four-year program may register for the program at the same time and in the same manner as they enroll in their other college courses and there is no military obligation. During their freshman and sophomore years, students enroll in the general military course. They then may compete for entry into the professional officer course, which is normally taken during the last two years of college. Selection into the professional officer course is highly competitive and is based on being medically qualified, physically fit, term and cumulative grade point averages, scores achieved on the air force officer qualifying test, successful completion of a four-week field training course at an Air Force base, and the recommendation of the Professor of Aerospace Studies.

Two-Year Program

The two-year program consists of the professional officer course, the last two years of the four-year program. It is designed to provide greater flexibility to meet the needs of both students and the air force. The basic requirement is that applicants have two academic years remaining at either the undergraduate or graduate levels, or a combination of both. After being nominated by the Professor of Aerospace Studies, applicants seeking enrollment in the two-year program are evaluated using the same criteria used for the four-year program except the length of the field training course is six weeks. Additionally, every professional officer candidate must agree to take and successfully complete a course in mathematical reasoning or its equivalent before graduation and commissioning. Courses previously completed may be used to satisfy this requirement.

Since the processing procedure must be completed several months in advance of intended enrollment, interested students must apply early in the fall semester of the academic year preceding the fall term in which they intend to enter the program. Application should be made in person to the Department of Aerospace Studies.

AFROTC develops students under the whole person concept. Cadets must maintain academic standards while taking on the additional responsibilities of AFROTC. These extra responsibilities include being physically fit and demonstrating integrity and good moral character. Cadets normally participate in approximately 2 hours per week of physical activity outside of class requirements.

Women in AFROTC

AFROTC at the University of Tennessee, Knoxville, has been coeducational since 1970. Women complete the same courses as men and have the same opportunities. Upon successful completion of the AFROTC program and degree requirements, women are commissioned in the air force as second lieutenants. Pay and job opportunities are equal for women and men. Virtually all career fields in the air force are open to women, including pilot and navigator positions.

Scholarships

Air Force ROTC Scholarships are available to qualified applicants in both the four- and two-year programs. Each scholarship provides full tuition, laboratory and incidental fees, and book fee. In addition, scholarship cadets receive a non-taxable stipend.
ranging from $250 to $400 each month during the school year while on scholarship status.

High School Students

Competitive four-year scholarships are available to high school students who enroll in certain scientific and engineering career fields. Some scholarships are also available to students who enroll in certain non-technical majors. Four-year scholarship application information is available on the AFROTC website at http://www.afrotc.com/.

College Students

Other scholarship opportunities exist for students already in college. Three- and two-year scholarships are available on a competitive basis and the student must have at least four, three, or two undergraduate or graduate years of study remaining in order to compete. Applications for these scholarships should be made directly to the Department of Aerospace Studies.

Leadership Grants

The University of Tennessee, Knoxville, AFROTC Leadership Grants are designed to attract and retain high quality students to the Air Force ROTC program for future positions of leadership within their service and our country. These grants are intended to complement other AFROTC and University scholarships by providing funds to offset costs for such areas as room and board, out-of-state tuition, and first year expenses for three-year AFROTC scholarship winners.

Up to twenty $500 leadership grants are available each year and are open to scholarship winners and any full-time student enrolled in the AFROTC program. Awarding of these leadership grants will be determined by the Professor of Aerospace Studies who will evaluate each candidate in the following areas – ACT/SAT scores, AFOQT test scores, GPA, physical fitness scores, leadership activities, and recommendations from people who can attest to the applicant’s leadership experience and skills.

Pay and Entitlements

All cadets enrolled in AFROTC are furnished texts and uniforms. Qualified junior and senior cadets with a cumulative grade point average (GPA) of 2.50 or better may receive a $3,000 scholarship that is applied toward their tuition and books. Additionally, these cadets receive a monthly stipend ranging from $250 to $400. In addition, they are paid mileage to and from field training, plus pay commensurate with active duty rates while at field training.

Active Duty Commitments

Commissioned graduates going into non-flying duties will be required to serve four years of active duty. Those graduates going into pilot assignments will be required to serve ten years active duty after completion of pilot training. Those graduates going into navigator assignments will be required to serve six years active duty after completion of navigator training.

This information is subject to change. For the most up-to-date information regarding AFROTC, contact AFROTC Detachment 800, 974-3041.

Air Force Aerospace Studies Curriculum

To receive a commission as a second lieutenant in the United States Air Force through the Air Force ROTC program, a student must successfully complete a four- or six-week field training encampment and take or receive credit for the following courses. Attendance at a six-week field training encampment satisfies all freshman and sophomore level course requirements.

### First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
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<tr>
<td>Aerospace Studies 101, 102</td>
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</tr>
<tr>
<td>Aerospace Studies 103, 104 (Leadership Laboratory) (S/NC)</td>
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### Second Year

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</tr>
<tr>
<td>Aerospace Studies 203, 204 (Leadership Laboratory) (S/NC)</td>
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### Third Year

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<th>Course</th>
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<tr>
<td>Aerospace Studies 303, 304 (Leadership Laboratory)</td>
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### Fourth Year

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<th>Course</th>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td>Aerospace Studies 401, 402</td>
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<tr>
<td>Aerospace Studies 403, 404 (Leadership Laboratory)</td>
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</tbody>
</table>

Professional Development Training Programs

To help cadets gain knowledge of the challenges in leadership and human relations encountered by a junior Air Force officer and to motivate them toward an Air Force career, cadets have the opportunity to participate in a variety of summer professional development training programs. Many of these programs are highly competitive. Some of these programs are described below.

**Academy Freefall Parachute Training**

A 12-day program conducted at the United States Air Force Academy. Successful completion of program results in a cadet receiving parachutist rating.

**Air Force Academy Soaring**

A 15-day program designed to give cadets the chance to experience the basic fundamentals of flight in non-powered glider operations. Cadets receive instruction in basic flight through ground school and actual flight, leading up to and possibly including cadet solo.

**Army Airborne Training**

Training lasts for 24 days and is physically and mentally demanding. Upon successful completion, cadets are awarded the parachutist rating. All training is conducted at Fort Benning, Georgia.

**ASSIST**

Rising sophomore cadets spend two weeks touring an active duty air force base and shadowing junior officers in various career fields.

**British Exchange**

Cadets are attached to a British university air squadron for 17 days of training and orientation at various Royal Air Force bases in the United Kingdom.

**Combat Survival Training**

A 20-day program incorporating combat, basic aircrew, and water survival training. Training is conducted at the United States Air Force Academy, Colorado Springs, Colorado.

**Field Engineering and Readiness Lab**

Provides opportunities for cadets with entry-level civil engineering courses to get hands-on work experience in the civil engineering career field. Training consists of two weeks working with civil engineering at an Air Force base and three weeks hands-on construction activities at the Air Force Academy, Colorado Springs, Colorado.

**Foreign Language Immersion**

Provides cadets majoring in a foreign language the opportunity to receive intensive language and cultural training. Training lasts for four weeks in various overseas countries.

**Nurse Orientation Program**

During a four-week internship program at Wilford Hall United States Air Force Medical Center, Lackland Air Force Base, Texas, nursing cadets receive hands-on experience and practical knowledge of air force nursing.

**Operation Air Force**

A three-week program of general orientation and shadowing of junior officers in various career fields. Program is conducted at air force installations throughout the United States.

**Pentagon Internship Program**

A three-week program to provide cadets an opportunity to work in the Pentagon. Students selected for the program gain problem-solving experience working with both military and civilian personnel on real world issues and participate as a team member with professionals in their chosen field of study.
University Libraries

Barbara I. Dewey, Dean
Jill Keally, Interim Associate Dean
Rita H. Smith, Associate Dean
Pauline Bayne, Assistant Dean

http://www.lib.utk.edu/

The University of Tennessee Libraries own approximately 2.6 million volumes and subscribe to more than 32,000 periodicals and serial titles. The UT Libraries are committed to providing access to information in all formats. A strong collection of electronic resources are available through the Libraries’ webpage at www.lib.utk.edu. UT’s Digital Library Center hosts a growing number of digital collections. The Libraries’ membership in the Association of Research Libraries reflects the university’s support of large collections of library materials to meet the needs of a comprehensive university curriculum.

Experts in each library offer help and assistance in using the library for research. AskUsNow (www.lib.utk.edu/refs/askusnow/) provides chat, e-mail, IM (instant message), and telephone connections to librarians. Students will find a wide variety of materials and services in the main library (John C. Hodges Library), three branches on the Knoxville campus (Agriculture and Veterinary Medicine Library, Music Library, and Special Collections), and the Social Work Library in Nashville.

Students can search the library catalog and hundreds of databases at any library location – and through the UT Libraries’ website. Interlibrary Services is available to help students find and retrieve materials that are not available in the UT Libraries. Workshops and classes are offered throughout the semester to help students learn how to get the most out of the Libraries’ services. The services and facilities of the UT Libraries are accessible to persons with disabilities.

The John C. Hodges Main Library (1015 Volunteer Blvd.) is a 350,000 square-foot building housing collections in all subject areas. Research assistance is available in the Commons (Rooms 220 and 235). Research Services (Room 135) offers more in-depth research consultation. The Commons, which is jointly staffed by the University Libraries and the Office of Information Technology, also offers a computer help desk, a wide range of software applications and computer equipment, spaces for individual and group study, and loaner laptops configured to access the wireless network. The Commons is open continuously from noon on Sunday to midnight on Friday, during Fall and Spring Semesters. A coffee shop and supply store on the second floor provide food, beverages, and supplies.

* Data describe the Knoxville campus, excluding the Law Library. The Law Library on the Knoxville campus and the libraries located on the campuses in Chattanooga, Martin, Memphis, and Tullahoma are separately administered.
floor serve students throughout the day and evening hours. The Studio (Room 245) offers students a state-of-the-art lab for graphics, video and web production. Still and video cameras are available for checkout from the Studio. Map Services (Room G20) supports students' research and everyday needs for maps and geographic information.

The Agriculture and Veterinary Medicine Library (Room A-113, Veterinary Teaching Hospital) has a strong collection in agriculture; veterinary, comparative and human medicine; environmental studies and biodiversity; and related biological sciences. The Music Library (301 Music Bldg.) has a comprehensive collection of music and music literature, including books, scores, audio and video recordings, current periodicals, and microfilm. Most materials in the Library of Congress "M" classification are located here.

Special Collections is dedicated to building collections of manuscripts, rare books, and other unique research materials. Collection strengths include Tennessee authors, Tennessee history and politics, Oak Ridge, and TVA. The Great Smoky Mountains Regional Collection is an ongoing effort to collect and preserve materials on the region. Students are welcome to use Special Collections. Materials from Special Collections cannot be checked out but may be used on site.

The Libraries maintain the university's Archives. The Archives, housed in Hoskins Library, contain official records of the university; items published by its units, departments, and agencies; and materials that document University of Tennessee life.

The Social Work Library (Room 292, 193-E Polk Ave., Nashville) serves College of Social Work students in field practice across the state. The library has a working collection of materials in social work and related disciplines.

Students and faculty may use the libraries at any of the University of Tennessee campuses across the state.
Courses of Instruction

Courses fulfilling the University General Education Requirement are designated as:

(AH) Arts and Humanities
(CC) Cultures and Civilizations
(OC) Communicating Orally
(NS) Natural Sciences
(QR) Quantitative Reasoning
(SS) Social Sciences
(WC) Communicating through Writing

REGISTRATION NOTES:
(RE) Prerequisite(s) and Corequisite(s) will be enforced by the Registration System in the future. They are currently enforced by the department.
(DE) Prerequisite(s) and Corequisite(s) are enforced by the department.
Registration Restrictions are enforced by the Registration System.

Accounting (009)

200 Foundations of Accounting (3) Introduction to financial and managerial accounting theory and practice with emphasis on the role of accounting information in business decisions.

207 Honors: Foundations of Accounting (3) Introduction to financial accounting theory and practice with emphasis on the role of financial information in business decisions. The course will make extensive use of computer technology for retrieving and analyzing financial information.

Recommended Background: 28 ACT composite or 1250 composite SAT required.


(RE) Prerequisite(s): Finance 301 and Business Administration 342.
Registration Restriction(s): Majors in the College of Business Administration.

311 Financial Reporting and Analysis (3) Theory and practice that underlies the preparation, analysis, and use of financial statements.

(RE) Prerequisite(s): 301.
Comment(s): Grade of C or better in 301 is required.
Registration Restriction(s): Majors in the College of Business Administration.

321 Cost Management (3) Cost information for products, services, and how cost information is recorded, analyzed, reported, and used in decision making. Topics include cost concepts and behavior, cost systems, budgeting, activity-based costing and management, and strategic cost management.

(RE) Prerequisite(s): 301.
Registration Restriction(s): Majors in the College of Business Administration.

411 Financial Compliance and Operational Auditing (3) Auditing’s role in society from an internal and external perspective, audit methodology, role of internal control and statistical sampling in auditing, fraud auditing, operational auditing, compliance auditing, and application of auditing procedures to specific transaction cycles.

(RE) Prerequisite(s): 301.
Comment(s): Grade of C or better in 301 is required.
Registration Restriction(s): Majors in the College of Business Administration.

414 Advanced Financial Reporting (3) Accounting standards for advanced financial reporting topics, such as statement of cash flows, income taxes, leases, accounting changes, consolidated financial statements, and foreign operations.

(RE) Prerequisite(s): 311.
Comment(s): Grade of C or better in 311 is required.
Registration Restriction(s): Majors in the College of Business Administration.

431 Federal Income Taxation (3) Fundamentals and concepts of federal income taxation. Emphasis on tax strategy, business taxation, and individual taxation. Topics include tax strategy modeling, gross income, deductions, credits, tax determination, property transactions, business entities, and basics of international taxation.

(RE) Prerequisite(s): 301.
Comment(s): Grade of C or better in 301 is required.
Registration Restriction(s): Majors in the College of Business Administration.

492 Accounting Internship (1-6)

Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum 6 hours.
Registration Restriction(s): Accounting major.
Registration Permission: Consent of instructor.

Advertising (012)

250 Advertising Principles (3) Survey of the role of advertising in American business and society. Relationship between advertising and marketing; functional components of the advertising process – research, media, creative, and management.

310 Advertising and Public Relations Design (3) Study, use, and application of design, color, type, and layout styles as they affect concept development of advertising, and the interaction of design, color, type, and layout styles with the creative, media, and management.

(RE) Prerequisite(s): 250 and Statistics 201.
Registration Restriction(s): Majors in the College of Business Administration.

330 Advertising Creative Strategy (3) Basic concepts of creative strategy with intensive practice in developing creative strategy statement, writing and designing advertisements, and judging creative work.

(RE) Prerequisite(s): 250 and 310.
Registration Restriction(s): Advertising major or public relations major.

340 Advertising Research Methods (3) Research techniques for advertising decisions.

(RE) Prerequisite(s): 250 and Statistics 201.
Registration Restriction(s): Advertising major or public relations major.

350 Advertising Media Strategy (3) Basic concepts of creative strategy with intensive practice in developing creative strategy statement, writing and designing advertisements, and judging creative work.

(RE) Prerequisite(s): 250 and 310.
Registration Restriction(s): Advertising major or public relations major.


(RE) Prerequisite(s): 340.
Registration Restriction(s): Advertising major or public relations major.
450 Advertising Management (3) Case-study approach to advertising decisions. Data analysis and interpretation, generating alternative strategies, oral and written presentation of recommendations. 
(Re) Prerequisite(s): 350 and 360. Registration Restriction(s): Advertising major or public relations major.

470 Advertising Campaigns (3) Group-based development, execution, and evaluation of an advertising campaign for a regional or national client. 
(Re) Prerequisite(s): 450 and Public Relations 370. Registration Restriction(s): Advertising major or public relations major.

480 Advertising Issues (3) Examination of the role of advertising in society and controversies surrounding economic, social, cultural, and ethical aspects of advertising. Emphasis on written and oral exposition of different viewpoints. 
(Re) Prerequisite(s): 360. Registration Restriction(s): Advertising major or public relations major.

490 Special Topics (3) Detailed study of a specialized area of advertising. Topics vary by semester and include advanced media strategy, advanced creative strategy, direct marketing, and multicultural advertising. 
(Re) Prerequisite(s): 360. Registration Restriction(s): Advertising major or public relations major.

492 Advertising Practicum (1) Experience in a functional area of advertising. 
Contact Hour Distribution: 10 hours laboratory each week. Grading Restriction: Satisfactory/No Credit grading only. Repeatability: May be explained. Maximum 2 hours. Registration Restriction(s): Advertising major or public relations major.

493 Independent Study (1-3) Individual study in a specialized area under the supervision of a faculty member. Repeatability: May be repeated. Maximum 3 hours. Registration Restriction(s): Advertising major or public relations major.

Aerospace Engineering (018)

201 Aerospace Seminar (1) An overview of aerospace engineering with lectures, laboratory demonstrations, and field trips. Aerospace history, aircraft and space flight fundamentals, propulsion techniques, wind tunnel testing, biomedical issues in aviation and space flight. Grading Restriction: Satisfactory/No Credit grading only. Registration Permission: Consent of instructor.

341 Fluid Mechanics I (3) Introduction to fluid flow concepts; hydrostatics; development of mass, momentum, and energy conservation laws in integral and differential form; dimensional analysis and similarity; viscous laminar and turbulent flows in pipes; introduction to boundary layers. 
(Re) Prerequisite(s): Mechanical Engineering 231 and Mathematics 241.

345 Aerospace Engineering Instrumentation and Measurement (3) Fundamentals of measurement systems; standards; dynamic characteristics of instruments; statistical data treatment; transducers; signal conditioning; strain, pressure, temperature and flow measurements. 
(Re) Prerequisite(s): 341 and Electrical and Computer Engineering 301. (Re) Corequisite(s): Mechanical Engineering 383.

351 Compressible Flow (3) One-dimensional internal flow with shocks, friction, and nonadiabatic conditions. Two-dimensional external flows. 
(Re) Prerequisite(s): 341 and Mechanical Engineering 331.

363 Structural Analysis of Aerospace Vehicles (3) Fundamentals of structural analysis applied to configurations common to aerospace vehicles. 
(Re) Prerequisite(s): Mechanical Engineering 321.

370 Airplane Performance (4) Airplane aerodynamics, characteristics of propulsion systems, prediction of airplane performance, static and dynamic stability, and control of aircraft. 
(Re) Corequisite(s): Mechanical Engineering 334.

410 Professional Topics (2) Topics relating to professional responsibility, communications, and organization. Formal oral presentation by each student on an engineering topic chosen by the student and approved by the instructor. 
(OC) (Re) Prerequisite(s): English 102. Registration Restriction(s): Minimum student level – senior.

422 Aerodynamics (3) Theory and design of aerodynamic bodies for desired characteristics. Potential flow theory, viscous effects, and compressibility effects. Subsonic, transonic, and supersonic airfoils. 
(Re) Prerequisite(s): 351 and 370.

424 Astronautics (4) Solar system; orbital mechanics; propulsion; atmospheric entry, including thermal protection materials, human factors in space flight, the space environment, and current topics. 
(Re) Prerequisite(s): 351. (Re) Corequisite(s): Mechanical Engineering 344.

(Re) Prerequisite(s): 351. Registration Restriction(s): Advertising major or public relations major.

426 Introduction to Aerospace Design (2) Design process, synthesis, design studies. Individual design reports required. 
(Re) Prerequisite(s): 351 and 370. (De) Prerequisite(s): 425. (Re) Corequisite(s): Mechanical Engineering 344.

429 Aerospace System Design (3) Synthesis and design of a complete aerospace system. Participation in team design effort including formal presentations and design report. 
(Re) Prerequisite(s): 426 and 422. (De) Prerequisite(s): 425.

449 Aerospace Engineering Laboratory (3) Designing, conducting, and reporting results of experimental exercises. Test standards and specifications. Analysis of data and formation of conclusions. 
Contact Hour Distribution: 3 hours lab per week. 
(Re) Prerequisite(s): 345 and 351.

494 Selected Topics in Aerospace Engineering (1-4) Problems and topics related to developments and practice in aerospace engineering. Repeatability: Not repeatable. May be taken once for 1-4 hours. Registration Permission: Consent of instructor.

495 Selected Topics in Aerospace Engineering (1-4) Problems and topics related to developments and practice in aerospace engineering. Repeatability: Not repeatable. May be taken once for 1-4 hours. Registration Permission: Consent of instructor.

Africana Studies (023)

162 Art of Africa, Oceania, and Pre-Columbian America (3) (See Art History 162.) (AH)

201 Introduction to African-American Studies (3) Multidisciplinary approach to the African-American experience through the Civil War period which examines such issues as traditional African societies, the institution of slavery, the development of African-American culture, the beginnings of African-American protest tradition, and the Civil War and Reconstruction. (SS)

202 Introduction to African-American Studies (3) Multidisciplinary approach to the African-American experience from the Civil War through the Civil Rights era which focuses on such topics as African-American rural and urban societies, the African-American church and education and African-American intellectual and protest movements. (SS)

225 Introduction to African Literature (3) Survey of first wave of African literature up to the mid-1960’s; course discusses the major genres and emphasizes comparative, cross-cultural and cross-national approaches. Writing-emphasis course. (Same as English 225.) (AH) 
(Re) Prerequisite(s): English 102 or 118.

226 Introduction to Caribbean Literature (3) (See English 226.) (AH)

233 Major Black Writers (3) (See English 233.) (AH)

235 Introduction to African Studies (3) Multidisciplinary approach to the study of African traditions, cultures, religions, political economies, pre-colonial democracies, and states from the first through the 16th century. Writing-emphasis course. (CC)

236 Introduction to African Studies (3) Multidisciplinary study of Africa and its incorporation into the world economy between the 16th and the 20th centuries. Includes the rise of nationalism, post-colonial dependency, contemporary problems, and current liberation struggles in various areas of the continent. Writing-emphasis course. (CC)

310 Introduction to African-American Music (3) (See MusicoLOGY 310.)

315 The African Diaspora (3) (See Anthropology 315.)

319 Caribbean Cultures and Societies (3) (See Anthropology 319.)

331 Race and Ethnicity in American Literature (3) (See English 331.)

333 Black American Literature and Aesthetics (3) (See English 333.)

335 African Literature (3) Survey of the major works and issues in African literature from the mid – 1960’s to the present. Special emphasis placed on the refashioning of the English language to carry an identifiably African experience; focus on fiction and drama, applicable theory and critical terms. Writing-emphasis course. (Same as English 335.) 
(Re) Prerequisite(s): English 102 or 118.

336 Caribbean Literature (3) (See English 336.)

343 Race and Ethnicity (3) (See Sociology 343.)
352 African-American Religion in the United States (3) (See Religious Studies 352.)
353 Topics in African-American Religion (3) (See Religious Studies 353.)
371 African History (3) (See History 371.)
372 African History (3) (See History 372.)
373 African Religions (3) (See Religious Studies 373.)
381 History of South Africa (3) (See History 381.)
421 Comparative Studies in African and African-American Societies (3) Comparative studies of African and African-American societies in such areas as education, religion, and social stratification. Includes the respective views African-Americans and Africans have of each other and the concept of Pan-Africanism. Writing-emphasis course.
429 History and Philosophy of African-American Education (3) Focuses on attempts by African-Americans to secure an education for themselves and their children from the era of slavery to the Brown decision in 1954. Examines black perceptions of the importance of education and special obstacles confronting African-Americans who seek education on the primary, secondary, college, or graduate level. Writing-emphasis course.
431 Research Seminar in Africana Studies (3) Teaches basic approaches to the research process and the development of research skills.
432 Senior Research Project (3) Students design and implement a research project of their choice in the field of Africana studies. Writing-emphasis course.
433 Topics in Black Literature (3) (See English 433.)
445 The African-American Experience from the Colonial Period to the Civil War (3) (See History 445.)
446 The African-American Experience from the Civil War to the Present (3) (See History 446.)
450 Issues and Topics in African-American Studies (3) Topics vary, but include a variety of problems, issues, and individuals from the field of African-American studies.
452 Black African Politics (3) (See Political Science 452.)
461 Art of Southern and Eastern Africa (3) (See Art History 461.)
462 Art and Archaeology of Ancient Africa (3) (See Art History 462.)
463 Arts of the African Diaspora (3) (See Art History 463.)
470 African-American Art (3) (See Art History 470.)
473 Black Male in American Society (3) Examines historical images, myths, and stereotypes which have developed concerning African-American males in American society. Includes the impact of such critical factors as black feminism, violence, concepts of masculinity, the family, white males, white females, homosexuality, nationalism, and athletics on African-American males in America.
480 African-American Communities in Urban America (3) Evaluates the benevolent and historical influence of three major institutions, the church, the family, and the school, upon the African-American struggle to survive. Includes political, economic, and social factors utilized by black people in developing coping strategies and mechanisms. Writing-emphasis course.
484 African-American Women in American Society (3) Focuses on historical and contemporary social, economic and political factors in American society as they relate to the black woman. Writing-emphasis course. (Same as Women’s Studies 484.)
491 Foreign Study (1-6) Repeatability: May be repeated. Maximum 6 hours.
(Re) Prerequisite(s): 201 and 202.
Registration Permission: Consent of instructor.
492 Off-Campus Study (1-6) Repeatability: May be repeated. Maximum 6 hours.
(Re) Prerequisite(s): 201 and 202.
Registration Permission: Consent of instructor.

493 Independent Study (1-6) Repeatability: May be repeated. Maximum 6 hours.
(Re) Prerequisite(s): 201 and 202.
Registration Permission: Consent of instructor.

496 Biology of Human Variability (3) (See Anthropology 496.)

Agricultural and Extension Education (042)
201 Field Experience in Agricultural and Extension Education (1) Field observation/experience in potential agricultural and extension education career fields. Requirements include daily journal, formal written report, completion of required hours, and seminar.
211 Foundations of Agricultural and Extension Education (3) History and philosophy of agricultural education and extension education. Major areas of emphasis include the historical development of agricultural education in the public schools and the federal extension education system. Formal and non-formal methods of education used, audiences served, organizational structure, and programming emphases will be studied by students. Foundation course for departmental majors and service course for those interested in related careers.
301 Non-Formal Youth Development Programs (1-2) Structured experience in administrating, organizing, conducting, and evaluating youth education programs in agricultural and extension education.
Repeatability: May be repeated. Maximum 6 hours.
345 Program Planning in Agriscience Education (3) Overview of the historical and philosophical aspect of agriculture education, the role of teacher and learner. Emphasis is on planning, methods course. Includes a lab component.
(Re) Prerequisite(s): 211.
434 Methods of Teaching Agriscience (3) Methods and techniques for teaching agriculture, preparing lesson plans and units of instruction, developing activities for agriculture programs, and utilizing resources, multimedia, and computer technology into instruction. To be taken in the fall prior to student teaching. Includes a lab component.
(Re) Prerequisite(s): 345.
435 Student Teaching in Agricultural and Extension Education (6) Full-time teaching practicum in an approved high school program. Applied practices needed by agricultural education teachers.
436 Student Teaching in Agricultural and Extension Education (6) Full-time teaching practicum in an approved high school program. Applied practices needed by agricultural education teachers.
440 Communication Techniques in Agriculture (3) Elements of effective use of mass media in agricultural and extension education. Effective technical writing and presentation strategies for agricultural audiences. (WC)
(Re) Prerequisite(s): English 101 and English 102.
Registration Restriction(s): Minimum student level – junior.
450 Agricultural Leadership Development (3) Identification of styles and roles of leadership; development of leadership techniques and skills required in working with organizations and youth groups; methods of resolving conflict, of communicating, of guiding and evaluating; and ethical considerations for leaders.
Registration Restriction(s): Minimum student level – junior.
492 Internship In Agricultural and Extension Education (1-6) Pre-approved off-campus supervised experience in county extension offices, agricultural businesses, or agricultural related agencies. Requires living off-campus for a specified time.
Repeatability: May be repeated. Maximum 6 hours.
493 Independent Study (1-3) Individualized study of a special project or problem in agricultural and extension education. Must be selected in consultation with the instructor.
Repeatability: May be repeated. Maximum 6 hours.

Agricultural and Natural Resource Leadership (043)
101 Introduction to Agricultural and Natural Resource Leadership (1) Analyze and evaluate students’ current beliefs about leadership and recognize and identify behaviors used by effective leaders in the field of agricultural and natural resources.
102 Leadership Development in Small Groups and Teams (3) Learning about leadership dynamics in small groups and how to be more influential in social and work settings related to the area of agricultural and natural resources.
COURSES OF INSTRUCTION

202 Leadership and Diversity in Organizations and Communities (3)
Analysis of the dynamic interactions of personal characteristics, technical skills, interpersonal influence, commitment, goals, and power necessary for both leader and follower effectiveness in complex agricultural and natural resource organizations. Examination of leadership theories and their applications in diverse organizations and communities.

303 Classic Figures in Leadership (3)
Examination of leadership from an applied context. Leadership is analyzed through a variety of genres: autobiography, drama, fiction, tracts and treatises, and speeches.

304 Leadership, Motivation, Power and Influence (3)
Classical and contemporary motivation theories as applied to leadership in agricultural and natural resource organizations and communities. Organizational influence processes, power and influence in organizations and communities.

412 Seminar in Agricultural and Natural Resource Leadership (1)
Analyzing contemporary issues in the field of agricultural and natural resource leadership.
Repeatability: May be repeated. Maximum 2 hours.

492 Internship in Agricultural and Natural Resource Leadership (3)
Pre-approved supervised experience with agricultural firm or organization in the area of leadership.
Repeatability: May be repeated. Maximum 6 hours.

Agricultural Economics (047)

110 Opportunities in Agricultural Economics and Business (1)
Overview of current issues and career opportunities for majors and non-majors.

201 Economics of the Global Food and Fiber System (4)
Introduction to microeconomic and macroeconomic principles and their application to the global food and fiber system. Specific topics include consumer and producer behavior, market equilibrium, monetary and fiscal policy, and international trade.

212 The Agribusiness Firm (3)
Introduction to agribusiness firm characteristics and decision-making. Overview of economic principles and the basic functions of management – planning, organizing, controlling, and directing. Specific topics include firm structure, forecasting, marketing and selling, budgeting, break-even analysis, use of financial statements, capital investment, supervision, staffing, and evaluation.

310 The Agricultural Employment Process (1)
Career planning, job markets in the agricultural industry, and techniques to obtain employment, including recruitment/placement services, resume construction, personal interviewing, and job-offer evaluation/analysis.

315 Agricultural and Environmental Law (3)
Survey of legal topics related to agriculture and the natural environment. Topics include introduction to legal system, real property, civil liabilities, contracts, commercial transactions, environmental and natural resource regulation, farm and business organization, estate planning, and effective utilization of legal counsel.
Registration Restriction(s): Minimum student level – junior.

320 Agricultural Microeconomics (3)
Application of microeconomics to agriculture. Production, consumption, firm behavior, and efficiency in the food and fiber industries.
(RE) Prerequisite(s): 212 and Economics 201.
Registration Restriction(s): Minimum student level – junior.

324 Quantitative Methods in Agricultural Economics (3)
Quantitative analytical tools used in economics and business. Simple and multiple linear regression techniques applied to economic data. Analysis of cross-section and time series data. Optimization techniques applied to economic and business decisions.
(RE) Prerequisite(s): Statistics 201.
(REA) Corequisites(s): 320.

342 Farm Business Management I (3)
Principles and procedures for determining most profitable business organizations and systems of operation; attention to traditional and nontraditional agricultural enterprises and businesses; nature of managerial processes; business records and their uses; budgeting, acquisition and management of capital, land, labor and machinery; farm business planning.
(REA) Prerequisite(s): 212 and Accounting 200.
Recommended Background: Introductory economics and microcomputer competence.

350 The Food and Agricultural Marketing System (3)
Survey of U.S. food and fiber marketing system; marketing functions; industry structure; market channels; marketing options of farmers; basic analysis of marketing problems.
(REA) Prerequisite(s): 212 and Economics 201.

355 Agribusiness Marketing and Professional Selling (3)
Role of marketing in the agribusiness organization, planning marketing efforts, and the strategic selling process. Topics include identification of market opportunities, targeting, marketing mix, and personal selling in agribusiness.
(REA) Prerequisite(s): 212 and Economics 201.

356 Marketing Team Participation (1-2)
Participation in the development of a total marketing plan for a product sold to or by farmers. Includes product identification; development of an action plan, including an extensive promotional plan, financial analysis, and evaluation. Requires preparation of final plan for presentation in written, oral, and visual formats. Plan presented in national competition during the National AgriMarketing Conference.
Repeatability: May be repeated. Maximum 6 hours.
Registration Permission: Consent of instructor.

360 Rural Economic Development (3)
Use of economic principles and analytical concepts in understanding the theory and process of rural economic development at the regional and subregional levels. Integrating historical and current information, students will explore the impetus of efficiency and equity as driving forces behind public sector and private sector initiatives to induce, manage and forecast development.
(REA) Prerequisite(s): Economics 201.

410 Seminar in Agricultural Economics and Business (1)
Practice of critical thinking, ethical behavior, teamwork, and conflict resolution within the content of agribusiness decision-making. Analysis of contemporary issues in the field of agricultural economics.
Registration Restriction(s): Agricultural economics and business major; minimum student level – senior.

412 Agricultural Finance (3)
Macro-finance, financial objectives, acquisition of debt and equity funds, capital investments, capital allocation, debt repayment, credit analysis, borrower and lender loan application analysis, insurance strategies, computer applications, kinds and sources of agricultural credit, and international trade.
(REA) Prerequisite(s): 212 and Accounting 200.
Recommended Background: Introductory economics and microcomputer competence.

420 International Agricultural Trade and Marketing (3)
Introduction to real and monetary aspects of international trade effect on agricultural commodity flows; partial equilibrium analysis of international trade in agricultural products; institutional aspects of international marketing of agricultural products.
(REA) Prerequisite(s): 320.

430 Food and Agricultural Policy (3)
Values, goals, and policy process. Economic rationale and effects of policy. Historical development and current characteristics of commodity, credit, food, and trade policy.
(REA) Prerequisite(s): 320.

442 Agribusiness Management (3)
Advanced concepts in developing business and marketing plans and in applied management principles, such as inventory control and pricing techniques. Discussion of management issues including going international, employee supervision, management succession and guerilla marketing. Teamwork emphasized in managing an agribusiness firm through game simulation. Written and oral presentation required.
(REA) Prerequisite(s): 212 and Accounting 200.
Recommended Background: Intermediate microeconomics.

444 Economics of Precision Farming Technologies (3)
Economic rationale for precision farming technologies. Topics include technology adoption, production economics, development of decision-making tools, and the use of spatial data for management of crop production systems.
(REA) Prerequisite(s): Economics 201 and Agriculture and Natural Resources 290.

470 Natural Resource Economics (3)
(REA) Prerequisite(s): Economics 201.

471 Applied Policy Analysis for Environmental and Natural Resource Management (3)
Application of a policy analysis framework to conflicts and issues associated with natural resource use and related environmental quality impacts. Design of institutional changes to improve economic efficiency and equity, with emphasis on the potential applicability of market-type and incentive-based policy mechanisms.
(REA) Prerequisite(s): Economics 201.

492 Off-Campus Internship (1-3)
Pre-approved supervised experience with firm or organization in the field.
Grading Restriction: Satisfactory/No Credit Grading only.
Repeatability: May be repeated. Maximum 6 hours.
(REA) Registration Restriction(s): Minimum student level – junior.
Registration Permission: Consent of instructor.
493 Independent Study (1-3) Directed individual or team research and report writing. Special courses in specific topics.
Repeatability: May be repeated. Maximum 6 hours.
Registration Restriction(s): Minimum student level – junior.
Registration Permission: Consent of instructor.

Agriculture and Natural Resources (088)
100 Orientation to Studies in Agriculture and Natural Resources (1) Orientation to academic advising and procedures in and information about the college will be emphasized. Various invited guests will review university resources available to help students succeed at their studies. Student-to-student and advisor-to-student sessions are included to discuss the College of Agricultural Sciences and Natural Resources experience.
Grading Restriction: A, B, C, No Credit grading.
Registration Restriction(s): Freshmen and sophomores only.

290 Computer Applications to Problem Solving (3) Use of computer technology to analyze and report problems related to agricultural sciences and natural resources. The use and integration of computer applications such as spreadsheets, databases, presentation graphics, word processing, and other applicable software as needed for problem analysis and reporting.
Contact Hour Distribution: 2 hours and 1 lab.

317 Agriculture and Natural Resources Honors Seminar (1) Discussion of selected topics, issues, and problems influencing national and international food, agriculture, and natural resources systems.
Grading Restriction: A, B, C, No Credit grading.
Repeatability: May be repeated. Maximum 4 hours.
Registration Permission: Consent of instructor.

330 Leadership Development in Agriculture and Natural Resources (1) Enrollment limited to College Ambassadors. Readings on leadership and personal development, communication techniques, and/or personality types.
Grading Restriction: A, B, C, No Credit grading.
Repeatability: May be repeated. Maximum 4 hours.
Registration Permission: Consent of instructor.

333 Food, Forests and the Environment (3) Overview of the environmental tradeoffs that have been, are, and will be required to produce the food, fiber, and other products needed to feed, clothe, and house a growing world population. Topics include basic natural resources; current practices in agriculture, forestry, and food handling; and practices related to quality of life issues, such as wildlife and landscape design.
Credit Restriction: May not be applied toward directed elective requirements.

481 Special Topics in Agriculture and Natural Resources (3) In-depth case study analysis of international topics related to agriculture and natural resources.

491 International Experience in Agriculture and Natural Resources (1-12) Credit for formalized international experiences related to agricultural sciences and natural resources. Determination of credit based on nature of the proposed experience. Students should discuss the opportunity with their faculty advisors prior to the trip to determine if it is appropriate for credit. Credit hours will be determined by the department and college depending on the extent of activity and types of projects and/or presentations to be completed by the student upon return.
Repeatability: May be repeated. Maximum 12 hours.
Registration Permission: Consent of instructor.

497 Honors: Independent Project (1-6) For students participating in the College of Agricultural Sciences and Natural Resources Honors Research and Creative Achievements Program. Consists of independent work with a faculty member.
Repeatability: May be repeated. Maximum 6 hours.
Registration Permission: Consent of instructor.

498 Honors Presentation (1) For students participating in the College of Agricultural Sciences and Natural Resources Honors Research and Creative Achievements Program. Final written report and oral presentation of the honors project.
Registration Permission: Consent of instructor.

Air Force Aerospace Studies (094)
101 The Air Force Today (1) Survey that focuses on the organizational structure and missions of the Air Force; officership and professionalism; and includes an introduction to communicative skills. A weekly Leadership Laboratory (LLAB) consisting of Air Force customs and courtesies, health and physical fitness, and drill and ceremonies is mandatory.
(REE) Corequisite(s): 103.

102 The Air Force Today (1) Survey that focuses on the organizational structure and missions of the Air Force; officership and professionalism; and includes an introduction to communicative skills. A weekly Leadership Laboratory (LLAB) consisting of Air Force customs and courtesies, health and physical fitness, and drill and ceremonies is mandatory.
(REE) Corequisite(s): 104.

103 Leadership Laboratory (1) Includes a study of Air Force customs and courtesies, drill and ceremonies, and giving military commands; instructing, correcting, and evaluating the preceding skills; studying the environment of an Air Force officer; and learning about opportunities available to commissioned officers.
Grading Restriction: Satisfactory/No Credit grading only.

104 Leadership Laboratory (1) Includes a study of Air Force customs and courtesies, drill and ceremonies, and giving military commands; instructing, correcting, and evaluating the preceding skills; studying the environment of an Air Force officer; and learning about opportunities available to commissioned officers.
Grading Restriction: Satisfactory/No Credit grading only.

201 The Development of Air Power (1) Focuses on factors contributing to the development of air power from its earliest beginnings through two world wars; the evolution of air power concepts and doctrine; and an assessment of communicative skills. A weekly Leadership Laboratory (LLAB) consisting of Air Force customs and courtesies, Air Force environment, drill and ceremonies, and field training orientation is mandatory.
(REE) Corequisite(s): 203.

202 The Development of Air Power (1) Focuses on factors contributing to the development of air power from its earliest beginnings through two world wars; the evolution of air power concepts and doctrine; and an assessment of communicative skills. A weekly Leadership Laboratory (LLAB) consisting of Air Force customs and courtesies, Air Force environment, drill and ceremonies, and field training orientation is mandatory.
(REE) Corequisite(s): 203.

203 Leadership Laboratory (1) Includes a study of Air Force customs and courtesies, drill and ceremonies, and giving military commands; instructing, correcting, and evaluating the preceding skills; studying the environment of an Air Force officer; and learning about opportunities available to commissioned officers.
Grading Restriction: Satisfactory/No Credit grading only.

204 Leadership Laboratory (1) Includes a study of Air Force customs and courtesies, drill and ceremonies, and giving military commands; instructing, correcting, and evaluating the preceding skills; studying the environment of an Air Force officer; and learning about opportunities available to commissioned officers.
Grading Restriction: Satisfactory/No Credit grading only.

205 Field Training (Academic Program) (1-4) Open only to 2-year program applicants. Role of United States military forces in contemporary world, with particular attention to the United States Air Force, its organization and mission, various component forces of U.S. military power, organization of America's defense structure, policies of major powers, and elements and processes in making of defense policy. Conducted at field training bases throughout the country.
Repeatability: Not repeatable for credit. May be taken once for 1-4 hours.
Registration Permission: Consent of department head.

301 Air Force Leadership and Management (3) Study of leadership and quality management fundamentals, professional knowledge, leadership ethics, and communicative skills required of an Air Force officer. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. A mandatory weekly Leadership Laboratory (LLAB) provides advanced leadership experiences in office-type activities and gives students the opportunity to apply leadership and management principles to this course.

302 Air Force Leadership and Management (3) Study of leadership and quality management fundamentals, professional knowledge, leadership ethics, and communicative skills required of an Air Force officer. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. A mandatory weekly Leadership Laboratory (LLAB) provides advanced leadership experiences in office-type activities and gives students the opportunity to apply leadership and management principles to this course.

303 Leadership Laboratory (0) Consists of activities classified as advanced leadership experiences. They involve planning, organizing, staffing, coordinating, directing, and controlling the military activities of the cadre corps; preparation and presentation of briefings and other oral and written communications; and providing interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets.
Grading Restriction: Satisfactory/No Credit grading only.
304 Leadership Laboratory (0) Consists of activities classified as advanced leadership experiences. They involve planning, organizing, staffing, coordinating, directing, and controlling the military activities of the cadet corps; preparation and presentation of briefings and other oral and written communications; and providing interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets.

Grading Restriction: Satisfactory/No Credit grading only.

401 National Security Forces in Contemporary American Society (3) Examines the need for national security, analyzes the evolution and formulation of the American defense policy, strategy, and joint doctrine; investigates the methods for managing conflict; and overviews regional security, arms control, and terrorism. Special topics of interest focus on the military as a profession, officership, the military justice system, and current issues affecting military professionalism. Within this structure, continued emphasis is given to the refinement of communicative skills. A weekly Leadership Laboratory (LLAB) consisting primarily of advanced leadership experiences in office-type activities is mandatory.

(Re) Corequisite(s): 403.

402 National Security Forces in Contemporary American Society (3) Examines the need for national security, analyzes the evolution and formulation of the American defense policy, strategy, and joint doctrine; investigates the methods for managing conflict; and overviews regional security, arms control, and terrorism. Special topics of interest focus on the military as a profession, officership, the military justice system, and current issues affecting military professionalism. Within this structure, continued emphasis is given to the refinement of communicative skills. A weekly Leadership Laboratory (LLAB) consisting primarily of advanced leadership experiences in office-type activities is mandatory.

(Re) Corequisite(s): 404.

403 Leadership Laboratory (0) Consists of activities classified as advanced leadership experiences. They involve planning, organizing, staffing, coordinating, directing, and controlling the military activities of the cadet corps; preparation and presentation of briefings and other oral and written communications; and providing interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets.

Grading Restriction: Satisfactory/No Credit grading only.

404 Leadership Laboratory (0) Consists of activities classified as advanced leadership experiences. They involve planning, organizing, staffing, coordinating, directing, and controlling the military activities of the cadet corps; preparation and presentation of briefings and other oral and written communications; and providing interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets.

Grading Restriction: Satisfactory/No Credit grading only.

American Studies (099)

310 Introduction to American Studies (3) Explores dynamics and nature of the culture(s) of the United States through interdisciplinary study and interpretation. Considers both mainstream and minority cultures. Writing-emphasis course.

312 Popular Culture and American Politics (3) (See Political Science 312.)

320 American Cultures (3) (See Anthropology 320.)

334 Film and American Culture (3) (See English 334.)

343 Race and Ethnicity (3) (See Sociology 343.)

345 Collective Behavior and Social Movements (3) (See Sociology 345.)

355 Religion and Culture in the United States (3) (See Religious Studies 355.)

356 The 1960s in America (3) (See History 356.)

381 Introduction to Folklore (3) (See English 381.)

410 Topics in American Culture (3) Content varies. Repeatability: May be repeated. Maximum 6 hours.

420 Political Attitudes and Behavior (3) (See Political Science 420.)

423 Geography of American Popular Culture (3) (See Geography 423.)

442 American Humor (3) (See English 442.)

450 Seminar in American Studies (3) Intensive study of a major issue in American studies scholarship.

469 Freedom of Speech (3) (See Communication Studies 469.)

491 Foreign Study (1-9)

Repeatability: May be repeated. Maximum 9 hours.

492 Off-Campus Study (1-9)

Repeatability: May be repeated. Maximum 9 hours.

493 Independent Study (1-9)

Repeatability: May be repeated. Maximum 9 hours.

Animal Science (113)

160 Introduction to Animal Science (3) Preparation of academic plans and career discussion. Introduction to structure and production principles of the food animal and horse industries. Overview of companion and alternative livestock. Market classes and grades of cattle, poultry and poultry products, lamb and wool, and swine.

Contact Hour Distribution: 2 hours and 1 lab.

220 Anatomy and Physiology of Farm Animals (3) Skeleton and joints; muscles; blood and microcirculation; the nervous, endocrine, cardiovascular, respiratory, and digestive systems; demonstrations of physical-chemical phenomena.

Contact Hour Distribution: 2 hours and 1 lab.

(Re) Prerequisite(s): Biology 130 or Biology 102.

Registration Restriction(s): Minimum student level – sophomore.

280 Biotechnology and Management Practices in Animal Production (3) Exposure to current animal agriculture management practices and biotechnology techniques as they affect beef, dairy, horse, poultry, sheep and swine industries. Includes animal behavior, restraint and welfare, computer applications, nutrients and nutrient utilization, waste management, food safety, animal reproduction, health and well being, and emerging technologies and opportunities in animal agriculture. (W/C)

Contact Hour Distribution: Two 3-hour labs.

285 Horse Handling and Care (3) Proper procedures for horse-human interaction and the recommended management procedures for horse care. The basic behavioral characteristics of the horse, an understanding of his physical and mental parameters and their use in horse-human communication. Interactions include imprinting, haltering, halter training, lounging, long-line driving, bridling, bitting, round pen training, saddling, and teaching to guide. Basic care includes food selection and management, post-natal care, restraint, foot care, dental care, grooming, loading and trailing, stall maintenance, internal and external parasite control, exercising, identification techniques, routine vaccinations and first aid. Safety for both horse and handler will be emphasized.

Contact Hour Distribution: Three 2-3 hour labs.

320 The Physiology of Reproduction and Lactation (3) Biology of sex and sexual differentiation, functional anatomy of male and female, reproduction and lactation, gametogenesis, neuroendocrinology and endocrinology of reproduction and lactation, sex cycles, folliculogenesis, ovulation, spermatogenesis, fertilization, embryonic development, implantation, pregnancy, parturition, initiation of lactation and maintenance of the dry period, artificial control of reproduction and lactation. (Same as Biochemistry and Cellular and Molecular Biology 320.)

Contact Hour Distribution: 2 hours and 1 lab.

(Re) Prerequisite(s): Biology 130 or Biology 102.

330 Comparative Animal Nutrition (3) Nomenclature, structures, functions, utilization, and deficiency symptoms of essential nutrients in carnivores, omnivores and herbivores.

(Re) Prerequisite(s): Chemistry 130 or Chemistry 110.

(De) Prerequisite(s): 220.

340 Principles of Animal Breeding (3) Genetic and environmental bases of animal variation. Selection and mating systems as mechanisms of genetic change. Planning breeding programs for economically important domestic species.

Contact Hour Distribution: 2 hours and 1 lab.

(Re) Prerequisite(s): Mathematics 125 or 151.

(De) Prerequisite(s): 220 and Mathematics 141.


Registration Restriction(s): Minimum student level – sophomore.

380 Animal Health Management (3) Characteristics, symptoms, prevention, and treatment of major diseases and parasites. Immunization, health regulations and herd health programs for all farm livestock species and poultry.

Contact Hour Distribution: 2 hours and 1 lab.

(Re) Prerequisite(s): 220.
381 Animal Nutrition and Production Systems (3) Fundamentals of production and management systems with an emphasis on nutrition in beef, dairy, pork, and poultry programs. Application of principles of nutrition, breeding, physiology, and marketing into enterprise systems. Decision-making management practices and information resources, enterprise evaluation, and comparison of production systems.

Contact Hour Distribution: 2 hours and 1 lab.
Registration Restriction(s): Not open to animal science majors.

395 Careers Seminar (1) Preparing students for career opportunities in animal agriculture, including both industry and academic advancement. Topics will include resume preparation, interview skills, internship opportunities, and Web-based employment search guides.

Registration Restriction(s): Minimum student level – junior.

420 Advanced Reproduction (3) Collection, evaluation, and preservation of ova, spermatozoa and embryos; application of methods of natural breeding and techniques of artificial insemination and embryo transfer; herd sire and dam evaluation; pregnancy determination; gestation and parturition; infertility; recent advances in theriogenology.

Contact Hour Distribution: 1 hour and 2 labs.
(RE) Prerequisite(s): 320.
Registration Restriction(s): Minimum student level – senior.

430 Nutrient Evaluation and Ration Formulation (3) Ration nutrient analysis and formulation for beef and dairy cattle, sheep, horses, swine, poultry, laboratory, zoo and companion animals. Mathematics and computer solutions and applications to formulate complex rations with constraints.

Contact Hour Distribution: 2 hours and 1 lab.
(RE) Prerequisite(s): 330.

461 Advanced Beef Cattle, Dairy Cattle, Horse, Poultry, Sheep and Swine Judging (1) Specialization in judging: evaluation, selection and presentation of oral reasons for classes of beef cattle, dairy cattle horses, poultry, sheep, and swine.

Credit Hour Distribution: 2 hours and 1 lab.
Grading Restriction: Satisfactory/No Credit grading only.
Registration Permission: Consent of department head.

481 Beef Cattle Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, production practices, and improvement programs. Management evaluated in terms of production responses and economic returns. Comparisons made to small ruminant, forage-based production systems.

Contact Hour Distribution: 2 hours and 1 lab.
(RE) Prerequisite(s): 330 and 380.
(RE) Corequisite(s): 320 and 340.

482 Dairy Cattle Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, production practices and herd improvement programs. Alternatives evaluated in terms of production responses and economic returns.

Credit Hour Distribution: 2 hours and 1 lab.
(RE) Prerequisite(s): 320 and 340.
(RE) Corequisite(s): 330 and 380.

483 Pork Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, production practices, and improvement programs. Management evaluated in terms of production responses and economic returns.

Credit Hour Distribution: 2 hours and 1 lab.
(RE) Prerequisite(s): 320 and 340.
(RE) Corequisite(s): 330 and 380.

484 Poultry Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, production practices, and improvement programs. Management evaluated in terms of production responses and economic returns.

Credit Hour Distribution: 2 hours and 1 lab.
(RE) Prerequisite(s): 320 and 340.
(RE) Corequisite(s): 330 and 380.

485 Horse Production and Management (3) Integration of principles of nutrition, breeding, physiology and ethology into complete production and management programs. Types of enterprises, management of feed and pasture resources, health maintenance and first aid, breeding and foaling, farm structures and equipment.

Contact Hour Distribution: 2 hours and 1 lab.
(RE) Prerequisite(s): 330 and 380.
(RE) Corequisite(s): 320 and 340.

489 Companion, Zoo, and Lab Animal Management (3) Principles of nutrition, physiology, breeding, handling, and history of breeds of common household pets, zoo animals, and animals used in scientific research. Specific species requirements and peculiarities. Laws and agencies governing use of laboratory animals. Laboratory analysis of blood metabolites commonly used to monitor health and nutritional status.

Contact Hour Distribution: 2 hours and 1 lab.
(RE) Prerequisite(s): 330 and 380.
(RE) Corequisite(s): 320 and 340.

492 Animal Science Field Study (1-6) Off-campus work experience approved by the department. Objective is to complement traditional classroom activities and give the student an opportunity to gain experience in industry. Students must submit official approval form prior to registration. The student will be evaluated on knowledge and skills and must submit a written summary after program completion.

Repeatability: May be repeated. Maximum 6 hours.
Registration Restriction(s): Minimum student level – sophomore.
Registration Permission: Consent of department head.

493 Independent Study in Animal Science (1-3) Approved supervised study in areas not formally presented in a course offered in the department. Written proposal of study is approved by the Department of Animal Science Undergraduate Committee. After completion of study, a written report is required and this report is maintained on file in the reference room of the department.

Repeatability: May be repeated. Maximum 6 hours.
Registration Restriction(s): Minimum student level – sophomore.
Registration Permission: Consent of department head.

494 Animal Science Teaching Assistant (1) Assist the primary instructor in laboratory instruction and demonstrations.

Grading Restriction: Satisfactory/No Credit grading only.
Registration Restriction(s): Minimum student level – sophomore.
Registration Permission: Consent of department head.

495 Ethics in Animal Agriculture (1) Discussion and presentations on issues related to ethics in animal research and industry.

Registration Restriction(s): Minimum student level – senior.

Anthropology (122)

110 Human Origins (3) Survey of humanity's background, fossil primates, fossil human remains, and living races of humankind. (NS)

Credit Restriction: Students may not receive credit for both 110 and 117.

117 Honors: Human Origins (3) Honors survey of humanity's background, fossil primates, fossil human remains, and living races of humankind. (NS)

Credit Restriction: Students may not receive credit for both 117 and 110.
Comment(s): Same as 110 but designed for high-achieving students.

120 Prehistoric Archaeology (3) Introduction to methods and techniques used to identify and date archaeological cultures, reconstruct past lifeways and describe cultural evolution. Overview of the prehistory of Africa, western Europe, southwest Asia, and the Americas from earliest dated human cultures to rise of complex civilizations. (CC)

Credit Restriction: Students may not receive credit for both 120 and 127.

127 Honors: Prehistoric Archaeology (3) Honors introduction to methods and techniques used to identify and date archaeological cultures, reconstruct past lifeways and describe cultural evolution. Overview of the prehistory of Africa, western Europe, southwest Asia, and the Americas from earliest dated human cultures to rise of complex civilizations. (CC)

Credit Restriction: Students may not receive credit for both 127 and 120.
Comment(s): Same as 120 but designed for high-achieving students.

130 Cultural Anthropology (3) Major concepts and methods in the study of culture; survey of cross-cultural similarities and differences in subsistence, social organization, economic, political, and religious institutions; language, ideology and arts. Contributions of anthropology to resolving contemporary human problems. (SS)

Credit Restriction: Students may not receive credit for both 130 and 137.

137 Honors: Cultural Anthropology (3) Honors introduction to major concepts and methods in the study of culture; survey of cross-cultural similarities and differences in subsistence, social organization, economic, political, and religious institutions; language, ideology and arts. Contributions of anthropology to resolving contemporary human problems. (SS)

Credit Restriction: Students may not receive credit for both 137 and 130.
Comment(s): Same as 130 but designed for high-achieving students.

210 Principles of Biological Anthropology (3) Mechanisms of biological evolution and adaptation in living and prehistoric humans. (WC)

(RE) Prerequisite(s): 110.

302 Anthropology of Religion (3) (See Religious Studies 302.)
304 Genetics and Society (3) (See Biochemistry and Cellular and Molecular Biology 306.)
305 Evolution and Society (3) (See Ecology and Evolutionary Biology 305.)
310 North American Indians (3) Comparative overview of Indian cultures of North America. Topical coverage ranges from prehistory and aboriginal lifeways to problems resulting from contact and acculturation. Writing-emphasis course. (RE) Prerequisite(s): 130.
311 Southeastern Indians (3) Survey of Southeastern American Indian cultures at the time of European contact. Emphasis on Cherokee culture and on the social, economic, and religious organization of aboriginal groups. (RE) Prerequisite(s): 130.
312 Appalachian Culture (3) Traditional Southern Appalachian subsistence patterns and economy, social organization, beliefs and values, folklore and customs; socio-cultural impacts of industrialization and modernization. Writing-emphasis course. (RE) Prerequisite(s): 130.
313 Peoples and Cultures of Mesoamerica (3) Pre-Columbian and Hispanic cultures of Mexico, Guatemala, Belize, El Salvador and Honduras. Patterns of cultural continuity and cultural change throughout Mesoamerica's history. Writing-emphasis course. (Same as Latin American Studies 313.) (RE) Prerequisite(s): 130.
315 The African Diaspora (3) An overview of anthropological perspectives on people of African descent and the impact of an African presence on societies in the Americas. The sociocultural experiences of African-Americans and their counterparts elsewhere in the hemisphere are situated in the context of a broader diaspora. Writing-emphasis course. (Same as Africana Studies 315.) (RE) Prerequisite(s): 130.
316 Peoples and Cultures of South America (3) An introduction to contemporary analysis and debate on South America that places the concept of "culture" in historical perspective and discusses the anthropological notion of "people" within the complexity of indigenous and black social formations. Writing-emphasis course. (Same as Latin American Studies 314.) (RE) Prerequisite(s): 130.
319 Caribbean Cultures and Societies (3) Anthropological approaches to key aspects of Caribbean history, sociocultural pluralism, racial and class stratification, patterns of economic development, and local and national-level political processes. Writing-emphasis course. (Same as Africana Studies 319.) (RE) Prerequisite(s): 130.
320 American Cultures (3) Anthropological perspectives on cultural diversity in America, including the immigrant experience and expressions of ethnicity, intercultural relations, occupational and interest group subcultures. Writing-emphasis course. (Same as American Studies 320.) (RE) Prerequisite(s): 130.
321 Indians of Northwest North America (3) Survey of American Indian cultures found in the Northwest Coast, Columbia Plateau, and Northern Great Basin culture areas. Writing-emphasis course. (RE) Prerequisite(s): 130.
322 Topics in U.S. Ethnography (3) Overview of culture patterns and ethnographic research on selected social groups or culture areas in the United States. Writing-emphasis course. Repeatability: May be repeated. Maximum 6 hours. (RE) Prerequisite(s): 130.
323 Topics in Latin American Ethnography (3) Overview of culture patterns and ethnographic research on selected social groups or culture areas in Latin America. Writing-emphasis course. Repeatability: May be repeated. Maximum 6 hours. (RE) Prerequisite(s): 130.
324 Topics in African Ethnography (3) Overview of culture patterns and ethnographic research on selected social groups or culture areas in Africa. Writing-emphasis course. Repeatability: May be repeated. Maximum 6 hours. (RE) Prerequisite(s): 130.
357 Junior Honors in Anthropology (3) Analytical, integrative review of current research directions and theories in anthropology. Registration Restriction(s): Anthropology major; 3.20 GPA.
360 North American Prehistory (3) Prehistoric cultures of North America from initial occupation of the continent to European contact. Writing-emphasis course. (RE) Prerequisite(s): 120.
361 Historical Archaeology (3) Historical archaeology of Euro-American, African-American, and Asian American cultures in the United States from 15th to 20th centuries. (RE) Prerequisite(s): 120.
362 Principles of Archaeology (3) Research strategies used in developing method and theory; constructing cultural histories; identifying site function and settlement-subistence patterns, and evaluating explanations of cultural change. (RE) Prerequisite(s): 120.
363 Prehistory of Tennessee (3) Archaeological principles and theory illustrated in history of archaeological research in Tennessee and through survey of prehistoric Indian cultures from initial occupation of the state to European contact. Writing-emphasis course. (RE) Prerequisite(s): 120. Recommended Background: 360.
369 Topics in Archaeology (3) Examination of selected frameworks and techniques for retrieval and analysis of archaeological materials. Repeatability: May be repeated. Maximum 6 hours. (RE) Prerequisite(s): 120.
373 African Religions (3) (See Religious Studies 373.)
400 Readings in Anthropology (1-6) Problem-oriented directed readings in anthropology. Repeatability: May be repeated. Maximum 6 hours. Registration Permission: Consent of instructor.
410 Principles of Cultural Anthropology (3) Exploration and illustration of major concepts, theories, and methods in cultural anthropology, with application to analysis of specific ethnographic cases. (RE) Prerequisite(s): 130.
411 Linguistic Anthropology (3) Basic linguistic concepts applied to research in cultural anthropology, particularly investigation of relationships between language and culture. (Same as Linguistics 411.) (RE) Prerequisite(s): 130 or Linguistics 200.
412 Folklore in Anthropology (3) Introduction to anthropological study of folklore, using folklore and folklore materials from various tribal, peasant, and complex societies. (RE) Prerequisite(s): 130.
413 Dynamics of Culture (3) Definition and in-depth study of major forms of culture change, ranging from evolution and diffusion to religious revitalization and political revolt. Continuity and change in diverse cultural settings examined through use of archaeological, ethnographic, and contemporary cases. (RE) Prerequisite(s): 130.
414 Political Anthropology (3) Examination of the organization and dynamics of power and politics in both stateless and state-level societies. The role of symbols, rituals, and ideologies in producing and reproducing power relations. The relationship between actors (individuals) and structures. The encapsulation of traditional political forms and systems within modern states. Writing-emphasis course. (RE) Prerequisite(s): 130.
415 Environmental Anthropology (3) Overview of theoretical and methodological approaches to the study of human / environmental interactions. Impacts of environmental change on society and culture; human impacts on environmental change. (RE) Prerequisite(s): 130.
416 Applied Anthropology (3) Introduction to principles, practice and ethics of anthropology applied to practical problems in non-academic settings. Overview of career opportunities in various domains of applied anthropology. (RE) Prerequisite(s): 130.
430 Fieldwork in Archaeology (3-9) Practicum work in archaeological data recovery and analytical techniques. Repeatability: May be repeated. Maximum 9 hours. (RE) Prerequisite(s): 120.
431 Ethnographic Research (3) Conceptual and practical exploration of methods and techniques cultural anthropologists use in fieldwork. (RE) Prerequisite(s): 130.
432 Anthropology of Warfare and Violence (3) Origins and tactics of warfare; overview of cultural foundations of warfare and structural violence; and effects on communities, social institutions, environments, and social organization. (RE) Prerequisite(s): 130.