TICKLE
COLLEGE OF ENGINEERING
THE UNIVERSITY OF TENNESSEE, KNOXVILLE

2017
STUDENT GUIDEBOOK
2018

www.engr.utk.edu
The course offerings and requirements of the University of Tennessee are continually under examination and revision. This student guide presents the offerings and requirements in effect at the time of publication, but there is no guarantee that they will not be changed or revoked. Current information may be obtained from the following sources.

**Admission Requirements** – *Contact the Director of Admissions.*

**Course Offerings** – *Contact the Department offering the course.*

**Degree Requirements** – *Contact the Office of the University Registrar, faculty advisor, head of major department, College Advising Center, or Dean of college/school.*

*Refer to the Engineering and Campus Resources section of this booklet for a more comprehensive list of resources and contact information at the University of Tennessee.*

CREDITS: Tickle College of Engineering Communications Office
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<td>Aerospace</td>
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<td>Biosystems</td>
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</table>

Welcome!
# Contacts

## Administrative Contacts

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Dean for Academic and Student Affairs</td>
<td>Masood Parang</td>
<td>865-974-2454</td>
<td><a href="mailto:mparang@utk.edu">mparang@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>101 Perkins Hall</td>
<td></td>
</tr>
<tr>
<td>Engineering Advising Office</td>
<td>Margie Russell</td>
<td>865-974-4008</td>
<td><a href="mailto:engradvising@utk.edu">engradvising@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>316A Perkins Hall</td>
<td></td>
</tr>
<tr>
<td>Engineering Fundamentals Division</td>
<td>Richard Bennett</td>
<td>865-974-9810</td>
<td><a href="mailto:rbennet2@utk.edu">rbennet2@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>207 Perkins Hall</td>
<td></td>
</tr>
<tr>
<td>Engineering Honors</td>
<td>Kevin Kit</td>
<td>865-974-9810</td>
<td><a href="mailto:kkit@utk.edu">kkit@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>322 Perkins Hall</td>
<td></td>
</tr>
<tr>
<td>Engineering Professional Practice</td>
<td>Todd Reeves</td>
<td>865-974-5323</td>
<td><a href="mailto:coop@utk.edu">coop@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>110 Perkins Hall</td>
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</tbody>
</table>

## Academic Departments

<table>
<thead>
<tr>
<th>Department</th>
<th>Chair</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biosystems Engineering &amp; Soil Science</td>
<td>Danielle Carrier</td>
<td>865-974-7266</td>
<td><a href="mailto:bess@utk.edu">bess@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>101 Biosystems Engr &amp; Env Science Bldg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Daniel Yoder</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program Coordinator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical &amp; Biomolecular Engineering</td>
<td>Bamin Khomami</td>
<td>865-974-2421</td>
<td><a href="mailto:cbe@utk.edu">cbe@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td>Brian Edwards</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Associate Head</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>419 Dougherty Bldg.</td>
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</tr>
<tr>
<td>Civil &amp; Environmental Engineering</td>
<td>Chris Cox</td>
<td>865-974-2503</td>
<td><a href="mailto:cee@utk.edu">cee@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td>John Schwartz</td>
<td></td>
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<tr>
<td></td>
<td>Associate Head</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>325 John D. Tickle Engineering Building</td>
<td></td>
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</tr>
<tr>
<td>Electrical Engineering &amp; Computer Science</td>
<td>Leon Tolbert</td>
<td>865-974-3461</td>
<td><a href="mailto:deptinfo@eecs.utk.edu">deptinfo@eecs.utk.edu</a></td>
</tr>
<tr>
<td></td>
<td>Syed Islam</td>
<td></td>
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<tr>
<td></td>
<td>Associate Head</td>
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</tr>
<tr>
<td></td>
<td>401 Min H. Kao Building</td>
<td></td>
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<tr>
<td>Industrial and Systems Engineering</td>
<td>John Kobza</td>
<td>865-974-3333</td>
<td><a href="mailto:isedept@utk.edu">isedept@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td>Mingzhou Jin</td>
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<tr>
<td></td>
<td>Program Coordinator</td>
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<tr>
<td></td>
<td>525 John D. Tickle Engineering Building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials Science &amp; Engineering</td>
<td>Veerle Keppens</td>
<td>865-974-5336</td>
<td><a href="mailto:mse@utk.edu">mse@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td>Claudia Rawn</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Program Coordinator</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>414 Ferris Hall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical, Aerospace, and Biomedical Engineering</td>
<td>Matthew Mench</td>
<td>865-974-5115</td>
<td><a href="mailto:mabeinfo@utk.edu">mabeinfo@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td>J.A.M. Boulet</td>
<td></td>
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<tr>
<td></td>
<td>Associate Head</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mechanical Program Coordinator</td>
<td>865-974-8376</td>
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</tr>
<tr>
<td></td>
<td>Hans DeSmidt</td>
<td>865-974-7640</td>
<td></td>
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<tr>
<td></td>
<td>Aerospace Program Coordinator</td>
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<tr>
<td></td>
<td>Jindong Tan</td>
<td>865-974-5250</td>
<td></td>
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<tr>
<td></td>
<td>Biomedical Program Coordinator</td>
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<tr>
<td></td>
<td>414 Dougherty Bldg.</td>
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</tr>
<tr>
<td>Nuclear Engineering</td>
<td>J. Wesley Hines</td>
<td>865-974-2525</td>
<td><a href="mailto:utne@utk.edu">utne@utk.edu</a></td>
</tr>
<tr>
<td></td>
<td>Ronald Pevey</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Program Coordinator</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>315 Pasqua Bldg.</td>
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</table>
**Tutoring**

**Chemistry Help Sessions**
513 Buehler Hall
865-974-3413

**Disability Services**
100 Dunford Hall
865-974-6087

**Educational Advancement Program**
Greve Hall Room 302
821 Volunteer Blvd.
865-974-7900

**Engineering Fundamentals Help Sessions**
108 Perkins Hall
865-974-9810

**Math Tutorial Center**
G012 Ayres Hall
865-974-4266

**Office of Multicultural Student Life**
1800 Melrose Ave. Black Cultural Ctr.
865-974-6861

**Writing Center**
212 Humanities & Social Sciences Bldg.
865-974-2611

**Student Success Center**
Greve Hall Room 324
821 Volunteer Boulevard
865-974-6641
Find additional tutoring locations at studentsuccess.utk.edu

**Additional Resources**

**Campus Information**
865-974-1000

**Center for International Education / Study Abroad**
1620 Melrose Avenue
865-974-3177

**Computer and Laptop Help**
The Commons
2nd Floor Hodges Library
865-974-4351

**Engineering Diversity Programs**
301 Perkins Hall
865-974-1931

**Financial Aid and Scholarships**
Hodges Library Ground Floor
865-974-1111

**International House**
1623 Melrose Avenue
865-974-4453

**Office of National Scholarships and Fellowships**
Room 130, Howard Baker Center
865-974-3518

**Office of Undergraduate Research**
407 Blount Hall
1534 White Avenue
865-974-8560

**One Stop Shop**
Financial Aid, Scholarships, Transcripts, Grades, General Questions
Hodges Library Ground Floor
865-974-1111

**Parking Services**
2121 Stephenson Drive
865-974-6031

**Student Counseling Center**
1800 Volunteer Boulevard
865-974-2196

**Student Health Services Clinic**
1800 Volunteer Boulevard
865-974-3135

**Student Judicial Affairs**
409 Student Services Building
865-974-3171

**University Honors Program**
130 Howard Baker Center
865-974-7875

**University Housing**
405 Student Services Building
865-974-2571

**Veterans Benefits**
209 Student Services Building
865-974-1500

**VolCard (UT ID) Office**
472 South Stadium Hall Gate 12-13
865-974-3430

**Contact information for individual colleges:**

**Agricultural Sciences & Natural Resources**
125 Morgan Hall
Phone: 865-974-7303

**Architecture & Design**
224 Art & Architecture Building
Phone: 865-974-3232

**Arts & Sciences**
313 Ayres Hall
Phone: 865-974-4481

**Business**
342 Haslam Business Building
Phone: 865-974-5096

**Communication & Information**
202 Communications Building
Phone: 865-974-3603

**Education, Health, & Human Sciences**
332 Bailey Education Complex
Phone: 865-974-8194

**Engineering**
316A, Perkins Hall
Phone: 865-974-4008

**Nursing**
203 Nursing Building
Phone: 865-974-7606

**Social Work**
303 Henson Hall
Phone: 865-974-3351
The Tickle 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 community.

Prior to advanced registration, all students who have earned fewer than 30 hours at UT Knoxville or are on Academic Probation, or have not declared a major within a specific college (undecided, pre-major, interest, undeclared) or are flagged as Off Track by UTrack system are required to meet with an advisor during each main term of the academic year (i.e., during fall and spring). All other students are required to consult with an advisor for a substantial conference during a designated term each year. Students whose ID numbers end in an even digit are required to meet with an advisor during fall semester. Students whose ID numbers end in an odd digit are required to meet with an advisor during spring semester. However, Engineering students are encouraged to consult regularly with their major advisor during each semester of the academic year, especially if they plan to participate in internship or co-op positions that might affect class scheduling.

Once students in the Tickle College of Engineering finish the first year coursework, they progress to their major and are assigned to a faculty advisor in their department. This is typically after students complete Math 141-142 (Honors 147-148) and EF 151-152 (Honors 157-158). For Computer Science, these progression courses are Physics 135-136 (Honors 137-138) and Computer Science 102 and 130. In all cases progression to the major includes being in Good Academic Standing (2.00 or better cumulative GPA). For most students this will be at the end of freshmen year, but for some it might be the following year in December if they finish these courses in the Fall semester.

New Students
New freshman students are assigned to the Engineering Advising Office for academic advising until they have completed the freshman curriculum. Freshman students admitted to the Tickle 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 professional advisors with faculty mentors in their selected departments.

The Engineering Advising Office delivers academic advising on an appointment basis. To make an appointment, use the e-mail link sent to you to schedule using Grades First.

Advising for students starts with honors, then EF 152/Physic 136, then EF 151/Physic 135 and Math 130.

Advising appointments are normally offered on thirty-minute individual intervals. Hours of operation are from 8:00 a.m. to 5:00 p.m. (Eastern), Monday through Friday.

Academic Standing
The University of Tennessee, Knoxville, expects all students who enter to make progress toward graduation. To graduate from UT Knoxville, a student must earn a minimum cumulative grade point average (GPA) of 2.00. The university reviews students’ academic records at the end of each term to determine academic standing. The catalog contains additional requirements for specific programs.

Good Academic Standing
A student is in good academic standing when both the student’s term and cumulative GPAs are 2.00 or higher or, if after two consecutive terms, the student’s cumulative GPA is 2.00 or higher and at least one term GPA is also 2.00 or higher.

Academic Probation
A student will be placed on Academic Probation when (1) his/her cumulative GPA falls below the minimum acceptable level of 2.00 for one semester or (2) the semester GPA falls below the minimum acceptable level of 2.00 two consecutive terms of enrollment. During the semester that a student is placed on Academic Probation, and any other semesters in Academic Probation, a student must participate in a special directive advising program to help the student address concerns that are impacting his/her academic performance and to outline a plan for achieving academic success. This model of early intervention is designed to help students regroup and position themselves for academic success. Students on Academic Probation status during a term will automatically be dismissed at the end of that term if both:
• The cumulative GPA is below a 2.00, and
• The term GPA is below a 2.00
A student will no longer be on academic probation when his or her cumulative grade point average is 2.00 or higher and the term grade point average is 2.00 or higher. This policy is in place in recognition of the University of Tennessee, Knoxville’s minimum grade point average of 2.00 for graduation.
Collaborative and Integrated Advising Community Supporting Student Success

**Professional Advisor** — Assist students in the development of educational plans that are consistent with their aspirations, interests, and strengths; encourage students’ holistic engagement (academically, socially, culturally, and professionally) with the college experience. Educate students about curricular requirements, academic standards/policies related to a chosen major. Guide students through career and professional development opportunities available. Assist students with course planning, academic forms, and technologies such as DARS, MyUTK, Grades First, and Alumni Career Database.

**Faculty** — Reinforce academic strategies to be successful in the major. Discuss faculty research in the major, preparation for graduate school interests, career opportunities in major field, collaborate with professional advisors on specific student issues. Discuss major specific course content, technical electives in the major, and concentrations and/or minors for the major.

**Career Counselor** — Guide students through self-exploration process that includes strengths, interests, abilities, and challenges relating those to the world of work and goals in higher education. Assisting students in developing educational plans that are consistent with academic and career goals. Refer to campus resources that support career exploration, experience learning, and leadership opportunities. Guide students through developing resume and interview skills.

**Transition Advisor** — Advising and creating new academic plans for students no longer meeting major requirements and are required to change majors/colleges. Advising new prospective and transfer students who are not admitted to the college of their choice. Advising students and creating new academic plans with students who want to change colleges/majors but are unclear as to their new academic/career goals.

**Success Center Coach** — Teach and support academic success strategies such as time management, prioritization of involvements, test taking skills, campus tutoring opportunities.
# How is College Life Different from High School?

<table>
<thead>
<tr>
<th>Personal Freedom in High School</th>
<th>Personal Freedom in College</th>
</tr>
</thead>
<tbody>
<tr>
<td>You may be able to join many clubs and activities while taking classes.</td>
<td>You must be selective in your participation choices to avoid overextending yourself.</td>
</tr>
<tr>
<td>Your time is usually structured by others.</td>
<td>You manage your own time.</td>
</tr>
<tr>
<td>Guiding principle: You will usually be told what your responsibilities are and corrected if your behavior is out of line.</td>
<td>Guiding Principle: You are old enough to take responsibility for what you do and don’t do, as well as for the consequences of your decisions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High School Classes</th>
<th>College Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>You spend 6 hours each day—30 hours a week—in class.</td>
<td>You spend 12 to 16 hours each week in class.</td>
</tr>
<tr>
<td>The school year is 36 weeks long; some classes extend over both semesters and some do not.</td>
<td>The academic year is divided into 2 separate 15 week semesters plus a week for exams. Summer School is in 3 sessions; First and Second are 4 weeks each and Full is all summer.</td>
</tr>
<tr>
<td>You are provided with textbooks at little or no expense.</td>
<td>You need to budget substantial funds for textbooks.</td>
</tr>
<tr>
<td>You are not responsible for knowing what it takes to graduate.</td>
<td>Graduation requirements are complex and differ for different majors and sometimes different catalog years. You are expected to know those that apply to you.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High School Teachers</th>
<th>College Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers check your completed homework.</td>
<td>Professors may not always check completed homework, but they will assume you can perform the same tasks on tests.</td>
</tr>
<tr>
<td>Teachers remind you of your incomplete work.</td>
<td>Professors may not remind you of incomplete work.</td>
</tr>
<tr>
<td>Teachers approach you if they believe you need assistance.</td>
<td>Professors are open and helpful, but most expect you to initiate contact if you need assistance.</td>
</tr>
<tr>
<td>Teachers present material to help you understand the material in the textbook.</td>
<td>Professors may not follow textbooks. Instead to amplify the text, they may give illustrations, provide background information, or discuss research about the topic you are studying. They may expect you to relate the classes to the textbook readings.</td>
</tr>
<tr>
<td>Teachers often write information on the board to be copied in your notes.</td>
<td>Professors may lecture nonstop, expecting you to identify the important points in your notes. When professors write on the board it may be to amplify the lecture, not to summarize it. Good note taking skills are a must.</td>
</tr>
<tr>
<td>Teachers often take the time to remind you of assignment and due dates.</td>
<td>Professors expect you to read, save, and consult the course syllabus. It spells out exactly what is expected of you, when assignments are due, and how you will be graded.</td>
</tr>
</tbody>
</table>
## How is College Life Different from High School?

<table>
<thead>
<tr>
<th>Studying in High School</th>
<th>Studying in College</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>You may study outside of class as little as 0 to 2 hours a week, and this may be mostly last minute test preparations.</strong></td>
<td><strong>You need to study at least 2 to 3 hours outside of class for each hour in class—every day.</strong></td>
</tr>
<tr>
<td><strong>You often need to read or hear presentations only once to learn all you need to learn about them.</strong></td>
<td><strong>You need to review class notes and text material regularly.</strong></td>
</tr>
<tr>
<td><strong>You are expected to read short assignments that are then discussed, and often re-taught, in class.</strong></td>
<td><strong>You are assigned substantial amounts of reading and problem solving which may not be directly addressed in class.</strong></td>
</tr>
<tr>
<td><strong>Guiding principle: You will usually be told in class what you need to learn from assigned readings.</strong></td>
<td><strong>Guiding Principle: It is up to you to read and understand the assigned materials; lecture and assignments proceed from the premise that you have already done so.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tests in High School</th>
<th>Tests in College</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Testing is frequent and covers small amounts of material.</strong></td>
<td><strong>Testing is usually infrequent and may be cumulative, covering large amounts of material. You, not the professor, need to organize the materials to prepare for the test. A course may only have 2 or 3 tests in a semester.</strong></td>
</tr>
<tr>
<td><strong>Time to finish tests may be abundant.</strong></td>
<td><strong>Testing in college requires you to budget your time and finish in time allowed.</strong></td>
</tr>
<tr>
<td><strong>Testing may ask for large amounts of memorization of material.</strong></td>
<td><strong>Testing in college will be applied knowledge to new problems and not memorization.</strong></td>
</tr>
<tr>
<td><strong>Teachers frequently conduct review sessions, pointing out the most important concepts.</strong></td>
<td><strong>Professors rarely offer review sessions, and when they do, they expect you to be an active participant, one who comes prepared with questions.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grades in High School</th>
<th>Grades in College</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consistently, good homework grades may help raise your overall grade when test grades are low.</strong></td>
<td><strong>Grades on tests and major papers usually provide most of the course grade.</strong></td>
</tr>
<tr>
<td><strong>Extra credit projects are often available to help you raise your grade.</strong></td>
<td><strong>Extra credit projects are often NOT available in college classes.</strong></td>
</tr>
<tr>
<td><strong>Initial test grades, especially when they are low, may not have an adverse effect on your final grade.</strong></td>
<td><strong>Watch out for your first tests. These are usually wake up calls to let you know what is expected. Seek tutoring support early and often in classes where low test grades happen. Tests may count different percentages toward your total grade—read your syllabus.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tutoring in high school</th>
<th>Tutoring in college</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students may only seek tutoring when failing.</strong></td>
<td><strong>Students seek tutoring from the beginning to help earn the best grades possible.</strong></td>
</tr>
<tr>
<td><strong>Tutoring is mainly with a teacher- one on one.</strong></td>
<td><strong>Tutoring in college may be with a professor or tutoring center staff or fellow student on campus. Often in small group or classroom setting.</strong></td>
</tr>
</tbody>
</table>
Scholarships, Student Organizations, Technology & Student Privacy

Tickle College of Engineering Undergraduate Scholarships

The Tickle College of Engineering annually awards an average of nearly $1,000,000 in scholarships to qualified undergraduate students. Students must be accepted into the University of Tennessee and the Tickle College of Engineering to apply for engineering scholarships. Students need not apply for specific scholarships as the Scholarship Committee will match qualified students with available awards. Please contact the One Stop Shop for the complete list of application requirements and deadlines, Hodges Library Ground Floor, 865-974-1111, onestop.utk.edu/your-money.

The returning/transfer student scholarship application is on MyUTK. **Application deadline is February 1.**

Scholarships are awarded each academic year in the spring for the upcoming fall semester. For more information contact the Academic and Student Affairs Office at 865-974-2454 or stop by 101 Perkins Hall.

Student Organizations and Honor Societies

engr.utk.edu/currentstudents/student-organizations

**Student Organizations**

- American Institute of Aeronautics and Astronautics
- American Institute of Chemical Engineers
- American Nuclear Society
- American Society of Agricultural and Biological Engineers
- American Society of Civil Engineers
- American Society of Mechanical Engineers
- Association of Computing Machinery
- College of Engineering Ambassadors
- Institute of Electrical and Electronics Engineers
- Institute of Industrial Engineers
- Institute of Transportation Engineers
- Material Advantage
- National Society of Black Engineers
- Society of Automotive Engineers
- Society of Plastics Engineers
- Society of Women Engineers

**Honor Societies**

- Chi Epsilon, Civil Engineering Honor Society
- Eta Kapp Nu, Electrical Engineering Honor Society
- Pi Tau Sigma, National Mechanical Engineering Honor Society
- Tau Beta Pi, National Engineering Honor Society

Technology

engr.utk.edu/ithelp/computers

Laptops are required for all students, including incoming freshmen. VolTech, located within the Student Union on campus, sells Apple and PC computers, mobile devices, and accessories at reduced rates for students. The website is shop.utk.edu/c-276-technology.aspx.

FERPA STATEMENT

*Family Education Rights and Privacy Act (FERPA)*

The method with which the University of Tennessee governs the distribution of student information is based on the Family Educational Rights and Privacy Act of 1974 or FERPA. This Act, as amended, established the requirements governing the privacy of student educational records in regards to the release of those records and access to those records. This Act is also known as the Buckley Amendment.

**The Act gives four basic rights to students:**

- the right to review their education records;
- the right to seek to amend their education records;
- the right to limit disclosure of personally identifiable information (directory information);
- and the right to notify the Department of Education concerning an academic institution’s failure to comply with FERPA regulations.

FERPA provides for confidentiality of student records; however, it also provides for basic identification of people at the University of Tennessee without the consent of the individual. Release of information to third parties includes directory information, such as contained in the campus telephone book, in the online web-based people directory and in sports brochures. Students are notified of their FERPA rights and the procedures for limiting disclosure of directory information in Hilltopics, at Orientation for new students, and on the website of the University Registrar, registrar.tennessee.edu.
**Tennessee Louis Stokes Alliance for Minority Participation (TLSAMP)**

The Tennessee Louis Stokes Alliance for Minority Participation (TLSAMP) is a partnership between Tennessee State University, LeMoyne-Owen College, Middle Tennessee State University, University of Memphis, University of Tennessee and Vanderbilt University. The program’s goal is to increase the number of under-represented minority students studying and graduating in Science, Technology, Engineering and Math (STEM).

The objectives to support the goal of the alliance are to:

- Recruit under-represented minority students to pursue science or engineering as a career;
- Improve the quality of the learning environment for under-represented minority science and engineering students at all schools; and
- Ensure that a large number of undergraduate students are prepared to enter graduate school.

**Retention Efforts**

- Financial Assistance
- Tutorial Programs/Services
- Strategies for Basic Skills Courses

**National GEM Consortium**

The University of Tennessee is a proud member of the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (GEM). The mission of GEM is to attract a pool of African American, Hispanic American and American Indian talent to careers in the fields of Science, Technology, Engineering and Mathematics (STEM) by promoting the attainment of advanced degrees.

Each year, GEM identifies and recruits more than 1,000 undergraduate students, graduate students and working professionals from these underrepresented groups for admission to advanced degree programs at the nation’s top universities. GEM provides graduate students with much-needed financial support that is often the deciding factor in pursuing graduate education through three graduate fellowship tracks:

- Master of Science in Engineering
- PhD in Science
- PhD in Engineering
Cooperative Education / Career Development

Engineering Professional Practice
Todd Reeves, Director
110 Perkins Hall, Knoxville TN 37996-2030
Telephone: 865-974-5323
coop.utk.edu

Cooperative Education (Co-op) Program
Students have the opportunity to gain real world experience in their engineering field of study by working at least three semesters with the same employer before they graduate.

Typically a co-op student will alternate between semesters of work and school during their sophomore and junior years. The exact co-op rotation plan is created by the student in coordination with the Engineering Professional Practice office and the needs of their particular co-op employer.

Most students find that undertaking co-op adds no more than three to six months of calendar time to their total undergraduate experience.

Center for Career Development, located on the top floor of the Student Union, is a university-wide department designed to help students explore majors and related career fields, plan and implement career goals, prepare for a job search, conduct on-campus interviews, and identify additional employment opportunities and resources.

Services for Engineering students include:

Career Planning
• Research majors and careers on the Career Development website and in the Career Development Resource Center
• Find out “What I Can Do With This Major” – information on majors and careers throughout the college
• Take career assessments to assist with career exploration and career planning
• Meet with a Career Counselor to discuss your options or register for Exploring Majors and Careers, a one-credit course with a focus on choosing a major and learning about what’s available at UT

Career Resources
• Career Resource Center: review a collection of career books, periodicals, pamphlets, and videotapes with information on careers, job search skills, employment opportunities, and salary ranges
• Career Website: a variety of valuable career articles, resume and cover letter samples and links to hundreds of other career-related Internet resources
• Workshops: held each semester on resume writing, cover letters, job fair success, interviewing, etiquette, company visit/second interview, graduate school, and other career topics
• Resume Critiques: resumes can be dropped off for overnight critiques at the Career Development offices or students can drop-by for a personalized review Monday-Thursday from 3 p.m.–5 p.m. during Fall and Spring Semester
• Part-Time Employment Listings/Consultant: information on part-time positions for students

Internship Program and Benefits
The internship program differs from co-op in that the students will only work one or two assignments typically with different employers. The work terms are usually in the summer. While students can still gain valuable engineering experience with multiple employers, the internships typically provide a sub-set of the total experience students obtain in the co-op program.

Co-op and Internship Program Requirements
To participate fully in the Engineering Professional Practice program, students should register with our office during the first semester of their freshman year. They will then have an opportunity to go through an in-depth advisement process, learn the steps to a successful job search, and be prepared to participate in our Engineering Fairs for co-op and internship opportunities.

Before students go on their first assignment, they must complete 30 hours of course work and be in good academic standing though the specific GPA requirements will vary depending on the needs of the employers.

• Disability Careers Office: assists students with disabilities with career planning services and guidance
• HIRE-A-VOL at career.utk.edu: online job and resume database listing employment opportunities for part-time, summer, internships, and full-time for UT students and alumni
• EF 301: Engineering Career Planning Placement—a one-hour Pass/Fail course designed to equip Juniors and Seniors with the right tools to land a great full-time job after graduation

Career Events
• Annual Job Fairs: career fair opportunities to speak informally with representatives from hundreds of organizations about part-time and summer jobs, internships, and full-time positions
• On-Campus Recruiting/Interviewing: approximately 300 organizations conduct over 6,000 interviews annually at UT through Career Development
• Information Sessions: conducted by employers throughout the year on opportunities within their organizations
• Special Engineering Career Events: Watch for these each semester!

career.utk.edu

Tickle College of Engineering Career Consultant:
Schedule an appointment with Travis Greenlee or Kertesha Riley, who work directly with engineering students, faculty, and employers, by calling 865-974-5435 or e-mailing tgreenl1@utk.edu or kriley6@utk.edu.
The University of Tennessee has embarked on an ambitious plan to help students gain the international and intercultural knowledge they need to succeed in today's world. Engineering, like all professions, is becoming very globally oriented. It is important for you to take advantage of opportunities while you are a student in order to be Ready for the World. Apply for your passport now—the world awaits!

**UT Programs Abroad Office (PAO)**

**Contact:**  
Center for International Education Programs Abroad Office  
1620 Melrose Avenue, Knoxville, TN 37996-3531  
Phone: 865-974-3177  
Fax: 865-974-2985  
Email: studyabroad@utk.edu

The “PAO” provides students with information about their options for overseas study, research, work, volunteer projects, and travel. The PAO administers most of UTs international one-for-one student exchange programs, including ISEP. Attend an information session at the Programs Abroad Office (1620 Melrose Hall). Information sessions are held at 2:00 pm every Monday-Friday during the academic year. During the general information session, we discuss the programs available to you, what to look for in a program, how to use the resource center, using financial aid, transferring credits, programs requirements, and will answer your questions. If you are unable to attend an information session due to a conflict at 2:00 pm, please contact our office and we will be glad to schedule an appointment for you (865-974-3177 or studyabroad@utk.edu).

**Study Abroad for Engineering Students**

Engineering study abroad programs allow you to stay one semester or shorter in an English speaking or foreign language-based schools throughout the world. You can choose between individual trips or pre-arranged trips, where you would live and travel with a small group of UT students. Prior to applying for an Engineering Study Abroad Program, you should schedule an advising session at the Tickle College of Engineering Advising Office. You are eligible to apply for the Study Abroad Program after freshman year or after the first semester at UT, if you are a transfer student. Most programs require a minimum 2.5 to 2.75 GPA. For non-English language programs, it is required that you have minimum 4 semesters of equivalent of foreign language (faculty-led programs are exceptions).

UT Study Abroad programs include 5 types of programs: UT faculty-led, Exchange, Direct, Third Party, and Academic Internships.

**Engineering Study Abroad Fellowship**

The Tickle College of Engineering offers competitive fellowships for students studying abroad. Students may apply for these competitive fellowships in the Engineering Outreach Office, located in 322 Perkins Hall.

**Engineering Outreach Office**

The Office of Engineering Outreach’s mission is to work with organizations across campus, throughout the community, and around the world to develop these “powerful learning opportunities” for engineering students. Through specialized coursework, opportunities to teach younger students, opportunities to be mentored by professionals, and study abroad, the outreach office seeks the continual development of our students’ sense of “engineering in the world.”

Emphasis is also placed on student interaction with the next generation of potential engineering students, promoting their abilities as problem solvers and involved citizens.

**Contact:**  
Judith Mallory, International Coordinator  
59 Perkins Hall  
Phone: 865-974-9234  
E-mail: jmallory@utk.edu  
Web: engr.utk.edu/global

**Global Engineering Initiatives**

The Tickle College of Engineering offers the opportunity for insight-abroad experiences for students for periods of a week to ten days, scheduled during school breaks. This enables the engineering major to have a short abroad experience without interrupting classes or delaying graduation.

The flagship program for this initiative is the Engineering Alternative Spring Break, an annual trip to a foreign location to participate in an engineering project of local impact. On trips during other times of the year, engineering students may participate in a field-relevant service project in a foreign location, see engineers at work outside of the United States, or observe engineering applications and methods employed abroad. This may happen through a visit to an engineering university, lectures on specific engineering challenges, tour of a plant or manufacturing facility, or observations of pertinent engineering developments in locations overseas. Students will also visit sites of cultural and historic significance.

Although these programs are not credit-bearing, they satisfy the Honors’ “Ready for the World” requirement and are a significant addition to a resume. A limited number of scholarships are offered to defray travel costs.

**Contact:**  
Judith Mallory, International Coordinator  
59 Perkins Hall  
Phone: 865-974-9234  
E-mail: jmallory@utk.edu  
Web: engr.utk.edu/global
Grades, Credit Hours, and Grade Point Average

The basic unit of credit at UT Knoxville is the semester hour. This normally represents one hour of lecture or recitation or two hours of laboratory work per week. Each course at the university carries a number of credit hours specified in the course description. At the completion of each course, a student will be assigned a grade reflecting the student’s performance in the course. Passing grades carry a certain number of quality points per credit hour in the course. A student’s grade point average is obtained by dividing the number of quality points the student has accumulated at UT Knoxville by the number of hours the student has attempted at UT Knoxville, not including hours for which grades of I, NC, NR, P, S and W have been received.

Undergraduate Grades

<table>
<thead>
<tr>
<th>Grade</th>
<th>Performance Level</th>
<th>Quality Points Per Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Superior</td>
<td>4.00</td>
</tr>
<tr>
<td>A-</td>
<td>Intermediate Grade</td>
<td>3.70</td>
</tr>
<tr>
<td>B+</td>
<td>Very Good</td>
<td>3.30</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>3.00</td>
</tr>
<tr>
<td>B-</td>
<td>Intermediate Grade</td>
<td>2.70</td>
</tr>
<tr>
<td>C+</td>
<td>Fair</td>
<td>2.30</td>
</tr>
<tr>
<td>C</td>
<td>Satisfactory</td>
<td>2.00</td>
</tr>
<tr>
<td>C-</td>
<td>Unsatisfactory</td>
<td>1.70</td>
</tr>
<tr>
<td>D+</td>
<td>Unsatisfactory</td>
<td>1.30</td>
</tr>
<tr>
<td>D</td>
<td>Unsatisfactory</td>
<td>1.00</td>
</tr>
<tr>
<td>D-</td>
<td>Unsatisfactory</td>
<td>.70</td>
</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>0.00</td>
</tr>
</tbody>
</table>

First Year Composition


International Students

Entering international students whose native language is not English are placed in English courses based on TOEFL scores. Advisors will assist students with English class placement.

ABC/No Credit Grading Scheme

This grading system does not include a grade for failure; instead, you receive an A, B, C, or NC (for “no credit”), depending on your performance in the course. The NC grade does not affect your GPA; it merely indicates that you need to re-enroll in the course for continued practice before moving to the next level.

Changes in Registration

Undergraduate students may add courses through the tenth calendar day counted from the beginning of classes fall and spring terms. Because of the nature of some courses, permission of the department head may be required to add a course after classes begin. Students may also, as departmental policies permit, change a section of a course through the add deadline.

Students may drop courses until the tenth calendar day from the start of classes with no notation on the academic record for full term courses in fall and spring.

From the eleventh day until the eighty-fourth calendar day, students may drop courses and will receive the notation of W (Withdrawn) for full term courses in fall and spring. Following are additional regulations related to dropping classes after the tenth day:

- Students are allowed four drops during their academic career (until a bachelor’s degree is earned).
- Students holding a bachelor’s degree who return to pursue a second bachelor’s degree are allowed four additional drops.
- Students pursuing more than one major or degree simultaneously are not allowed additional drops.
- The W grade is not computed in the grade point average.
- After the 84th day, no drops are permitted.
- Courses may be dropped on the web (myutk.utk.edu).

Failure to attend a course is not an official withdrawal and will result in the assignment of an F grade.

The periods for add, drop, change of grading for sessions within the full term, summer, and mini term are determined based on a percentage of the equivalent deadline for the full term. See Timetable of Classes each term for exact dates on the MyUTK website at myutk.utk.edu. Deadline dates may be adjusted if the deadline falls on a holiday, weekend day or spring recess.

\[
W = \bar{v} \cdot \bar{\theta} \\
\dot{P} = \bar{v} \cdot \bar{\omega} \\
KE = \frac{1}{2} I \omega^2
\]
Grades that do not Influence Grade Point Average

The following grades carry no quality points and hours for which these grades are earned are not counted in computing a student’s grade point average.

- **NC (No Credit)** indicates failure to complete a course satisfactorily when taken on an S/NC basis.
- **S (Satisfactory)** is assigned for C or better work when a course is taken on an S/NC grading basis.
- **W (Withdrawal)** is assigned in courses when a student has officially withdrawn from the university. W is also assigned in courses when a student withdraws from a course between the 11th and 84th calendar day of classes. Regulations concerning withdrawal from courses or from the university appear under Changes in Registration.

Satisfactory/No Credit Grading System

The purpose of this system is to encourage the student to venture beyond the limits of those courses in which the student usually does well and, motivated by intellectual curiosity, explore subject matter in which performance may be somewhat less outstanding than work in other subjects. To this end, Satisfactory/No Credit (S/NC) grading has been developed for undergraduate courses (100-, 200-, 300 and 400-level courses).

- Neither grade is counted in a student’s grade point average, but, like all other grades, is entered on the permanent record.
- S is given for C or better work on the traditional grading scale and NC is given for grades of C-, D+, D, D- and F.
- The student only receives credit in the course if an S is received.
- A student may not repeat a course for S/NC if the student received a conventional grade (A, A-, B+, B, B-, C+, C, C-, D+, D, D- and F).
- If the student elects non-conventional grading, grades of A-, B+, B, B-, C+, C, C-, D+, D, D- or F as NC.
- The grade of I for incomplete work will be recorded as an SI, which will not be computed in the average.
- A student is permitted to change the system of grading in a course through the add deadline.
- The changing of an S/NC grade to a conventional letter grade or vice versa is not permitted unless an error is determined by the Office of the University Registrar.

Repeating Courses

General Repeat Policy

Students who are struggling with a class should talk with their advisor before deciding whether to withdraw from and/or plan to repeat a class.

- Courses may be repeated twice, for a total of three attempts per course.
- A grade of W does not count as one of the three attempts.
- Grades of C-, D+, D, D-, F, Incomplete, and NC are counted as one of the three attempts.
- No course may be repeated if a grade of C or better has already been earned.
- Each repeated course is counted only once in determining credit hours presented for graduation.
- With limited exceptions (see Grade Replacement Policy), all grades earned in repeated courses will count in calculating the GPA.
- Exceptions to the number of times a course may be repeated will be allowed only with prior written permission from the head of the department where the course is being offered and the student’s college dean or designee.

Grade Replacement Policy for Three Lower Division (100-200 Level) Courses

- The first three lower-division (100-200 level) course grades may be replaced when a course is repeated. All other grades will be included in computing the cumulative grade point average.
- If the same course is repeated more than once, the additional repeat(s) will count toward the grade replacement total.
- Repeating a course in which an NC or a W grade has been earned does not count as one of the three grade replacements.
- The grade earned during the final attempt will be used in computing the cumulative GPA.
- All grades for all courses remain on the transcript.
- Transfer course grades cannot be replaced (see Transfer Admission policy).

One Stop Shop

Hodges Library Ground Floor
Knoxville, TN 37996-0200
Phone 865-974-1111
onestop@utk.edu
**Career Information**

What can I do with this engineering major?

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**Aerospace Engineering**

mabe.utk.edu

**What is Aerospace Engineering?**

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 propulsion systems are also an integral part of this education. These include guidance, control, environmental, ramjet, rocket, turbojet, turbo-fan and piston engine/propeller systems. The educational objectives of the aerospace engineering program are:

- to provide an education that includes in-depth fundamental 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;

**Career Opportunities in Aerospace Engineering**

The demand for air transportation is projected to increase many-fold early this century. Our renewed quest in space will accelerate as full realization is made of spin-off benefits to society. These endeavors will increase employment opportunities for aerospace engineers in the future. Graduates at UT are actively sought by industry and government aerospace organizations nationwide. Major employers such as Boeing, Pratt and Whitney, NASA, General Electric, Honeywell, Lockheed-Martin, ATK and Arnold Engineering Development Center (which houses the largest wind tunnel test facilities in the world, located in Tullahoma, Tennessee) actively recruit our students. Many of our B.S. students chose to continue their education at graduate school.

**Biomedical Engineering**

mabe.utk.edu

**What is Biomedical Engineering?**

Biomedical engineering is the application of engineering principles and methods to the solution of problems in the life sciences. This broad field spans applications at the molecular level (genetic engineering); at the cellular level (e.g., cell and tissue engineering); and in intact organisms, including humans in particular. Mature practice areas include the design of biomedical measurement systems (e.g., intensive care monitoring stations); orthopedic devices (e.g., artificial joints); and artificial organs (e.g., artificial kidneys). Currently, there is much attention being given to computational biosciences, advanced medical imaging systems and advanced artificial organs (e.g., heart-assist and total artificial heart blood pumps, artificial livers). Among the most exciting new areas of biomedical engineering research is the newly defined discipline of cell and tissue engineering, which involves the modification of living cells and tissues to meet specific clinical needs (e.g., artificial skin).

In their professional roles, biomedical engineers must be knowledgeable in both the life sciences and the engineering sciences. In many career roles, biomedical engineers serve an intermediary role in bridging the gap between classically trained engineers and medical practitioners. Basic life science preparation includes the study of cell biology and human anatomy and physiology. The engineering preparation includes basic mechanics, electrical and electronic circuits, materials science, thermodynamics and fluid mechanics. Required mathematics include calculus, differential equations, matrix methods and statistics. 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.

The university’s engineering programs are fully accredited by the ABET Engineering Accreditation Program.

**Career Opportunities in Biomedical Engineering**

Biomedical engineers work in a variety of settings including the biomedical product manufacturing industry, biomedical research and development organizations, hospitals (as clinical engineers), for governmental agencies (e.g., FDA, NASA, DOD), and in biomedical product technical sales. Work in many of the more challenging technical areas (e.g., cell and tissue engineering) requires an advanced degree.
Career Information
What can I do with this engineering major?

Biosystems Engineering
bioengr.ag.utk.edu

What is Biosystems Engineering?
Today’s tightly-focused engineering specialties would probably amaze the great engineers of the past. Many of them were successful precisely because they understood a diverse range of engineering concepts and could integrate that knowledge in new and startling ways.

Biosystems engineering is the most “integrative” engineering discipline available today. It combines elements from environmental, mechanical, civil, electrical and other engineering disciplines to produce the broadest possible engineering skill set. This engineering background is complemented with a focus on biologically-based systems-critical for solving problems involving people and the environment. Finally, biosystems engineering adds the peripheral skills needed to be successful in an engineering career-intensive design projects; computer and graphics training; presentation skills; engineering economics; and practical teamwork.

With this broad foundation, upper-level biosystems engineering students are uniquely positioned to focus on almost any area of engineering. Potential areas include biofuels; environmental systems; machine design and optimization; soil and water conservation; instrumentation and sensors; bio-reactors, food processing; waste treatment; or any of a host of other possibilities.

The BESS department’s program objectives: Recent graduates are to be
• competitive in seeking employment at the regional and national levels;
• aware of meeting their own and societal needs consistent with the goals of life-long learning, professional ethics and leadership;
• performing as entry-level engineers in a manner that positively reflects on the overall program’s reputation. The university’s engineering programs are fully accredited by the ABET Engineering Accreditation Program.

Career Opportunities in Biosystems Engineering
As a biosystems engineer, you can choose from an unusually diverse range of job opportunities. You will be well prepared to lead a team as a project engineer because of your broad engineering background. You could also choose to design products or processes in a variety of agricultural, manufacturing and service industries. You might consider working as a consultant, in product marketing, or for a management services firm. Government agencies and educational and research institutions also employ many biosystems engineers, or you may want to enhance your career by entering graduate or medical school. You will be particularly qualified to work at the interface of technology and living systems—whether in food and fiber production, environmental issues or in a biological context.

Chemical and Biomolecular Engineering
cbe.utk.edu

What is Chemical and Biomolecular Engineering?
Chemical and Biomolecular engineering deals with developing industrial processes and systems used to manufacture products that require chemicals. Chemical and Biomolecular engineers play a very important role in the production of items we use every day such as foods, medicines, fuels and clothing. Some examples of chemical engineering include developing improved food processing techniques, producing medicines more affordably in large quantities, finding more efficient ways to refine petroleum, and constructing fibers that make clothing more comfortable and resistant to stains.

As a chemical and biomolecular engineering student at UT, you will learn how to design processes and equipment for reacting chemicals that will improve the way many items critical to today’s modern society are created. You will study the concepts of heat transfer, mass transfer, kinetics, and fluid flow to solve problems that may lead to the development of new medications, computing devices, fuels, plastics, and polymers vital to enhancing the quality of life around the globe.

The objectives of the chemical and biomolecular engineering degree program are:
• Graduates of the UT chemical and biomolecular engineering program who enter professional practice will demonstrate a high level of technical competence, along with career progression toward positions of technical or managerial leadership.
• Graduates of the UT chemical and biomolecular engineering program who pursue full-time graduate or advanced professional study will complete their programs of study successfully.
• Graduates of the UT chemical and biomolecular engineering program will continue their professional growth through lifelong learning.

The university’s engineering programs are fully accredited by the ABET Engineering Accreditation Program.

Career Opportunities in Chemical and Biomolecular Engineering
As a graduate of the chemical and biomolecular engineering program, you will be able to pursue a career in many different areas such as pharmaceuticals, textiles, electronics, energy and biotechnology. Chemical and biomolecular engineers can be found anywhere, from large manufacturing plants to small medical research laboratories. Many of our students also choose to continue their education at graduate or medical school.
Civil and Environmental Engineering

CEE.UTK.EDU

What is Civil and Environmental Engineering?

Civil engineering is about the basic infrastructure of society and community service, development and improvement—the planning, design, construction, and operation of facilities essential to modern life and economic vitality.

An established department at the University of Tennessee, Knoxville, Civil and Environmental Engineering dates back to the mid-1800s, making it one of the oldest programs in the Southeast.

The Civil and Environmental Engineering Department (CEE) offers proficiency in environmental and water resources engineering, geotechnical and structural engineering, construction, and transportation engineering leading to a Bachelor of Science in Civil Engineering. In addition, the College of Engineering offers an undergraduate minor in environmental engineering.

Academic units and areas of research include the following: transportation systems planning and design; transportation safety; traffic operations; transportation air quality; investment and financial analysis; bridge testing and evaluation; testing of masonry in-fills; lateral load test of driven piles; testing, behavior and modeling of highway materials; stability of slopes, embankments and tunnels; non-destructive evaluation of pavement systems; railroad engineering; risk assessment; automated highway systems; intelligent vehicle systems; GPS/GIS applications; air pollution control technologies; air pollution dispersion modeling; climate change and environment and associated impact on infrastructure; water and waste water treatment; hazardous waste management; environmental restoration; mixed and radioactive waste management; bioremediation; aquatic chemistry; fate and transport of contaminants; surface and ground water hydrology; erosion and sediment transport; soil and geosynthetic hydraulic barriers; remediation of mines and characteristic of fractures in soil and rock.

Consistent with the mission of the Department of Civil and Environmental Engineering at The University of Tennessee, graduates of the program will have:

1. Technical competency to conduct engineering projects and to advance with increasing responsibility.
2. Professional competency to continually increase engineering proficiency, proceed on a track to attain professional licensure, and contribute to the profession and community.

The university’s engineering programs are fully accredited by the ABET Engineering Accreditation Program.

Career Opportunities in Civil and Environmental Engineering

Civil engineers are found throughout the workplace in a variety of functions. Aside from private engineering firms that are responsible for contracted projects from start to finish, civil engineers work for utility companies, telecommunications businesses, consulting firms and even toy and athletic equipment manufacturers. There are a large number of civil engineers who work in federal, state and local governments, working each day to serve the public in thousands of projects nationwide. Civil engineers also work in academic fields through teaching, research, evaluation and publishing, generating much of the current information available today.

In their first job, most civil engineers are teamed with a senior engineer. They are guided through a variety of assignments, depending on the civil engineering specialty area. Later, job responsibility increases with continuing education and experience. During this process many engineers seek professional licensure that requires a depth of knowledge and skills essential to success in the field.

Civil engineers usually work for one of the following employer types (in approximate order of employed engineers): government (every city, county, state and federal operation); consulting firms (all sizes); construction companies; industry (e.g., petroleum, utilities, aircraft, chemical, paper, shipbuilding); international firms (may involve the categories above).
Career Information
What can I do with this engineering major?

Computer Engineering
www.eecs.utk.edu

What is Computer Engineering?
Computer engineering deals with the electronic hardware side of electrical engineering and the programming side of computer science. Often, a student can study electrical engineering to cultivate a background in computer engineering. However, with the increasing needs of both industry and technology that drive our future, computer engineering has now become a discipline by itself. Typically, a computer engineering curriculum provides a background in three broad areas—hardware, software, and hardware-software integration. Students will also have the opportunity to explore fundamental topics such as microprocessors, computer architecture, digital signal processing, operating systems, data communications, and other related material. In addition, the program includes core engineering subjects that are common to all engineering disciplines.

The program educational objectives of the computer engineering program include:
• Will apply the knowledge of the fundamentals of engineering, science and mathematics in the practice of electrical/computer engineering or in advanced professional studies; will identify, formulate and solve electrical/computer engineering problems.
• Will analyze and design complex devices and systems containing hardware and software components with consideration of economic, ethical, safety, environmental, and social issues; will be able to use modern engineering techniques, skills and tools.
• Will communicate effectively, function on multi-disciplinary teams, and engage in lifelong learning.

The university’s engineering programs are fully accredited by the ABET Engineering Accreditation Program.

Career Opportunities in Computer Engineering
Computer hardware engineers are expected to have favorable job opportunities. Employment of computer hardware engineers is projected to increase faster than the average for all occupations, reflecting rapid employment growth in the computer and office equipment industry, which employs the greatest number of computer engineers. Consulting opportunities for computer hardware engineers should grow as businesses need help managing, upgrading and customizing increasingly complex systems. Growth in embedded systems, a technology that uses computers to control other devices such as appliances or cell phones, also will increase the demand for computer hardware engineers.

Career Opportunities in Computer Science
Career Opportunities in many fields exist for our graduates. Most generally, they are prepared to work in laboratories that develop software intensive products. These include, for example, automotive components, financial systems, consumer appliances (cell phones, personal computers), communication infrastructure devices (routers, switches), scientific research facilities (space stations, telescopes, reactors) and weapon systems.

Computer Science
www.eecs.utk.edu

What is Computer Science?
At one pole is computer science, primarily concerned with theory, design, and implementation of software. It is a true engineering discipline, even though the product is as intangible as a computer program. At the other pole is computer engineering, primarily concerned with firmware (the microcode that controls processors) and hardware (the processors themselves, as well as entire computers).

It is not possible to draw a clear line between the two disciplines; many practitioners function to at least some extent as both computer engineers and computer scientists.

Computer Science is the study of software and hardware systems, and theory of computation. Students must be able to integrate material and concepts from these areas. So, for example, students use analysis of algorithms to select or design software to solve a problem on a computer with parallel architecture. Another example would be selecting or writing the software for a network router, combining optimization theory, graph algorithms, networking, knowledge of the hardware and professional software methods. The emphasis is on foundations and the ability to learn new developments in the field.
Designs that enhance the quality of life for all people, both as sciences. This concern for the human element leads to systems engineering also emphasizing the life sciences and social mathematics and the physical sciences. However, industrial engineering disciplines, industrial engineering is based on integration of new technologies. In common with all approach, scientific method, engineering design, and Industrial engineers create value through a total systems humankind, in terms of safety, quality and productivity. The industrial engineer's objective that distinguishes industrial engineering from the other disciplines because of its wide range of applications. Subject areas within electrical engineering are so diverse that it is not always apparent that there is an underlying connection. The range of subjects is not only broad but is also expanding.

The program educational objectives of the electrical engineering program include:
- Will apply the knowledge of the fundamentals of engineering, science and mathematics in the practice of electrical/computer engineering or in advanced professional studies; will identify, formulate and solve electrical/computer engineering problems.

**Industrial Engineering**

**ise.utk.edu**

**What is Industrial Engineering?**

Originally, the industrial engineering profession focused on manufacturing. Today’s industrial engineer is involved in the design of systems and processes to produce and deliver goods and services not only in manufacturing, but also in the service industries and government sectors of the economy. Industrial engineers are concerned with the design of integrated systems involving people, materials, facilities, finances, equipment, and energy to ensure the overall system functions efficiently and human needs are adequately met. Industrial engineering is distinctive in two respects: The industrial engineer typically works on problems or systems which include human beings as a major variable; and the industrial engineer is by definition a systems engineer, whose unique combination of skills can be applied to many working environments.

It is this emphasis on people, science and technology that distinguishes industrial engineering from the other engineering disciplines. The industrial engineer’s objective is to achieve the best possible results for the benefit of humankind, in terms of safety, quality and productivity. Industrial engineers create value through a total systems approach, scientific method, engineering design, and integration of new technologies. In common with all engineering disciplines, industrial engineering is based on mathematics and the physical sciences. However, industrial engineering also emphasizes the life sciences and social sciences. This concern for the human element leads to system designs that enhance the quality of life for all people, both as producers and consumers of products and services. Students in the Industrial Engineering program can also gain hands-on experience and forge beneficial relationships with industry, business, and agencies through the College’s cooperative engineering program or internships. The department’s faculty is also very active in research and offers opportunities for students to get involved working with various research centers on campus.

The educational objectives of the Industrial Engineering Program are to prepare our students to:
- have successful professional careers that employ industrial and systems engineering concepts and principles,
- pursue life-long learning,
- achieve positions of leadership.

The university’s engineering programs are fully accredited by the ABET Engineering Accreditation Program.

**Career Opportunities in Industrial Engineering**

Industrial engineers have an almost unlimited range of career fields available, including retail distribution, banking, health-care delivery, corporate management, consulting firms, aerospace systems, research groups, government and military agencies as well as manufacturing. In all areas of manufacturing, service and government, there is increasing emphasis on the goal of improving quality and productivity. Industrial engineers work closely with the top management in these sectors to achieve this goal. IE’s command very competitive salaries in a strong market that is expected to grow by 20% over the next decade – the third strongest growth of the fifteen engineering disciplines. IE’s also rank very high in job satisfaction surveys.

**Career Information**

**What can I do with this engineering major?**

**Electrical Engineering**

**www.eecs.utk.edu**

**What is Electrical Engineering?**

Electrical engineering deals with the application of the physical laws governing charged particles. From miniature integrated circuits that contain millions of microelectronic devices, to high-speed fiber-optic communication systems that span international boundaries, electrical engineering impacts every aspect of modern-day living. Electrical engineering is unique among the engineering disciplines because of its wide range of applications. Subject areas within electrical engineering are so diverse that it is not always apparent that there is an underlying connection. The range of subjects is not only broad but is also expanding.

The program educational objectives of the Electrical Engineering Program are to prepare our students to:
- will provide openings for graduates who have learned the latest technologies.
- Will analyze and design complex devices and systems containing hardware and software components with consideration of economic, ethical, safety, environmental, and social issues; will be able to use modern engineering techniques, skills and tools.
- Will communicate effectively, function on multi-disciplinary teams, and engage in lifelong learning.

The university’s engineering programs are fully accredited by the ABET Engineering Accreditation Program.

**Career Opportunities in Electrical Engineering**

The growth trends for employment of electrical engineering graduates are expected to increase. Projected job growth stems largely from increased demand for electrical and electronic goods, including advanced communications equipment, computer communications, biomedical instrumentation, defense-related electronic equipment, and consumer electronics products. The need for electronics manufacturers to invest heavily in research and development to remain competitive and gain a scientific edge will provide openings for graduates who have learned the latest technologies.


Materials Science & Engineering
mse.utk.edu

What is Materials Science and Engineering?

Materials Science and Engineering (MSE) is a discipline that is on the leading edge of technology through the development of new materials and the improvement of existing materials for applications in all engineering fields. It is at the forefront of modern technological advances and its graduates are in great demand.

Materials engineers can be found working in all technological fields, usually as part of a multidisciplinary team. For this reason, materials engineers receive a broad engineering education that includes design, mechanics, chemistry, physics, mathematics and electronics. The processing and testing of materials are core subjects in the MSE curriculum that stresses “hands-on” learning through laboratory classes that introduce students to modern processing and characterization techniques.

Modern engineering materials are used in a broad spectrum of products, including automobiles, aircraft and spacecraft, jet and rocket engines, surgical implant devices, computers, cell phones, optical displays, textiles and sports equipment. The types of engineering materials include metals and alloys, polymers and plastics, ceramics, semiconductors, and composites.

The department has one of the lowest student-faculty ratios (about 4:1) in the College of Engineering. This allows MSE students to receive a great deal of individual interaction with the faculty, especially in laboratory courses. The educational objectives of the program for the degree of B.S. in Materials Science and Engineering are:

• to provide students with a knowledge of the fundamentals of appropriate physical and chemical sciences, mathematics and engineering sciences; and to demonstrate the applications of these principles to solve engineering problems with emphasis on materials processing, structure, properties and performance. This knowledge base includes the development of analytical and experimental skills.

• to provide students with experiences in design and materials selection such that they can design components, systems or processes with consideration of economic, safety, environmental and social issues.

• to develop professional skills in such areas as written and oral communications, problem solving and working in diverse teams, that prepare graduates to practice materials engineering in contemporary and global environments.

• to provide students with a general education component that complements the technical content, encourages the appreciation of cultural and social values, exhibits the impact of engineering solutions on society, and enhances personal development.

The university’s engineering programs are fully accredited by the ABET Engineering Accreditation Program. Career Opportunities in Materials Science and Engineering Graduates with a Bachelor of Science (B.S.) degree in Materials Science and Engineering receive employment offers from a wide range of industries both in Tennessee and nationwide. MSE graduates can be found working in many different capacities, including basic and applied research, product and process development, manufacturing, quality control, material selection and failure analysis. Materials science graduates frequently opt to continue their education through graduate school for Master of Science and Ph.D. degrees.
Mechanical Engineering
mabe.utk.edu

What is Mechanical Engineering?
Mechanical engineering is the application of the laws of solid and fluid mechanics and the thermal sciences to the analysis, design and/or manufacturing of systems and products. Mechanical engineers play a key role in national, state and local economies by bringing their expertise to the development of power generation systems (such as steam turbines, jet engines and internal combustion engines) that provide mechanical power to all segments of society. They also bring essential expertise to manufacturing processes, efficient production methods and automation vital to the well being of the national economy. Their expertise and involvement in the analysis, design and development of new products and materials for new devices and systems produce economic activity and provide employment opportunities which sustain high standards of living.

The mechanical engineering program at UT offers fundamental education in the engineering sciences and engineering design. The engineering science component educates students in the fundamental principles of engineering, while the engineering design component emphasizes design methodology, enhances creative skills and develops student ability to solve open-ended problems of the type common to industry.

The undergraduate experience is broad-based and includes, in the first two years, general education in mathematics, sciences and preliminary design courses that are common with curricula in other engineering programs.

The discipline of a rigorous technical program along with education in the humanities and social sciences provides a good foundation for a rich and rewarding career in a dynamic marketplace.

The objectives of the mechanical engineering degree program are:
• to prepare students for professional careers by developing their skills in problem formulation, problem solving, analysis, computation, synthesis, teamwork and effective communication
• to teach students the underlying principles of mechanical and thermal systems and the application of these principles in the design process
• to instill in students an appreciation for the importance of lifelong learning, individual professionalism and ethical practice
• to prepare capable students for graduate study at major universities

Career Opportunities in Mechanical Engineering
Because of the broad-based education received in mechanical engineering, mechanical engineers play a vital role in a wide variety of industries (e.g., aerospace, automotive, electronics, power utilities, chemical, petroleum, textile, manufacturing); federal agencies (e.g., NASA, DOE, DOD, FAA); and consulting firms and national laboratories (e.g., ORNL, SANDIA). In these different sectors, mechanical engineers are involved in analysis and design of systems and products; manufacturing, automation and control of production and processes; heating, ventilation, and air conditioning systems; and research. Mechanical engineers are also found at every level of management.

Mechanical engineers have been and will continue to be in great demand in all of the areas listed above.
Career Information
What can I do with this engineering major?

Nuclear Engineering
ne.utk.edu

What is Nuclear Engineering?
Nuclear engineering is the engineering discipline that focuses on the application of sub-atomic processes for the benefit of mankind and our environment. Radiological engineering is a special concentration within nuclear engineering that deals with the design and safe utilization of radiation in industry and medicine. Some examples of nuclear and radiological engineering are listed below:

- Production of electric power with essentially no air pollution
- Processes for the diagnosis and treatment of diseases such as cancer
- Activation analysis for identifying materials including environmental pollutants
- Radiography inspection of welds in bridges and boilers
- Food preservation and sterilization of medical supplies
- Radioisotope gauges for use in manufacturing processes
- Nuclear measurement techniques for oil well logging and airport security
- Radioactive tracer elements for use in medical research
- Generation of radioisotope power for deep space exploration

The educational objectives for the department are to:

- provide students with fundamental knowledge in mathematics, computer science, the basic sciences and the engineering sciences that are necessary to solve complex problems in nuclear and radiological engineering;
- provide students with a real-world design and analysis experience in nuclear and radiological engineering that includes 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 compliment their technological education in order to understand and appreciate the importance of each in society and in personal development; and
- foster a genuine desire for life-long learning in students.

Career Opportunities in Nuclear Engineering
Nuclear engineering is actually a very broad and diverse engineering discipline with graduates employed in a wide variety of fields including the electric utility industry (e.g., TVA, Duke Energy, Southern Nuclear Co., Entergy), private industry (e.g., General Electric, Westinghouse, Honeywell, Emerson), and government laboratories (e.g., DOE’s Oak Ridge National Laboratory and NASA’s Johnson Space Flight Center). Nuclear engineering graduates also work as medical physicists and radiation safety officers at hospitals and other health related facilities. The current job market for nuclear engineers is excellent and is expected to improve in the future.

\[ v_2 = v_1 + a\Delta t \]
\[ s_2 = s_1 + \left( \frac{v_1 + v_2}{2} \right) \Delta t \]
\[ s_2 = s_1 + v_1\Delta t + \frac{1}{2} a\Delta t^2 \]
\[ s_2 = s_1 + \frac{v_2^2 - v_1^2}{2a} \]
# Engineering Majors

catalog.utk.edu

## Aerospace Engineering Catalog 2017

### Full Status Progression

A lower-division student may apply for progression to upper division after completing EF 152/158, CHEM 120/128, MATH 231, ME 202, ME 231, and ME 321 with a grade of C or better in each, and an overall GPA of at least 2.4. Students who have not satisfied the requirements for full status will be dropped from departmental class rolls in upper division courses.

### Provisional Status Progression

Students who have completed EF 152/158, CHEM 120/128, MATH 231, ME 202, ME 231, and ME 321 with a grade of C or better and have an overall GPA between 2.0 and 2.4 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 2.0 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 2.0 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. Transfer courses with grades below a C will not be accepted to fulfill any degree requirements.

### Departmental Academic Standing

A minimum grade point average of 2.0 in all departmental courses counted toward the degree. Students not meeting the required departmental GPA may be dropped from their major. In addition, the University Academic Good Standing Policies apply to all students.

### AE Graduation Requirements

A minimum GPA of 2.0 in all departmental courses counted toward the degree taken at the University of Tennessee, Knoxville, is required for graduation. No more than two departmental courses in which a C- or lower is the highest grade earned may be counted toward graduation. This is in addition to the university’s graduation requirements.

Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.

### UTRACK Milestones:

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<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
<th>Term 5</th>
<th>Term 6 through 8</th>
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<td>EF 152/158 or Physics 136/138</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
<td>No Milestones</td>
</tr>
</tbody>
</table>

### Departmental Electives Choose from:

- ME 315, 365, 366, 403, 404, 408, 470, 472, 474, 477, 479, 460. Other courses require prior approval by the department.

### Full Status Progression

A lower-division student may apply for progression to upper division after completing EF 152/158, CHEM 120/128, MATH 231, ME 202, ME 231, and ME 321 with a grade of C or better in each, and an overall GPA of at least 2.4. Students who have not satisfied the requirements for full status will be dropped from departmental class rolls in upper division courses.

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### Departmental Academic Standing

A minimum grade point average of 2.0 in all departmental courses counted toward the degree. Students not meeting the required departmental GPA may be dropped from their major. In addition, the University Academic Good Standing Policies apply to all students.

### AE Graduation Requirements

A minimum GPA of 2.0 in all departmental courses counted toward the degree taken at the University of Tennessee, Knoxville, is required for graduation. No more than two departmental courses in which a C- or lower is the highest grade earned may be counted toward graduation. This is in addition to the university’s graduation requirements.

Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.

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<td>EF 152/158 or Physics 136/138</td>
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<tr>
<td>Term 5</td>
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Students also have opportunities for an Honors Concentration. See the Undergraduate Catalog for details and requirements.
## Biosystems Engineering Catalog 2017
### Pre-Professional Concentration

#### Fall
- **16 hours**
  - **Math 141 or 147 (4) FA, SP**
  - **EF 151 or 157 (4) FA, SP**
  - **English 101 or 118 (3) FA, SP, SU**
  - **Chem 120 or 128 (4) FA, SP, SU**
- **Math 130 or higher or one SS or one 400 or one CC**
- **Prereq- Math 130 or Math ACT 26 or Math SAT 630**
- **Coreq- Math 141 or 147 and EF 151 or 157**
- **Coreq- Math 142 or 148**
- **Coreq- EF 151 or 157**
- **16 hours**

#### Spring
- **17 hours**
  - **Math 142 or 148 (4) FA, SP, SU**
  - **EF 152 or 158 (4) FA, SP, SU**
  - **ME 202 (2) FA, SP, SU**
  - **English 102 (3) FA, SP, SU**
  - **Chem 120 or 128 (4) FA, SP, SU**
  - **Prereq- Math 130 or Math ACT 28 or Math SAT 630**
  - **Prereq- EF 151 or 157**
  - **Prereq- Math 141 or 147**
  - **Prereq- EF 151 or 157**
  - **BSE 104 (1) SP**

#### Fall
- **17 hours**
  - **Math 241 or 247 (4) FA, SP, SU**
  - **ME 231 (3) FA, SP, SU**
  - **BSE 201 (1) FA**
  - **Chem 120 or 128 (4) FA, SP, SU**
  - **Prereq- Math 130 or Math ACT 28 or Math SAT 630**
  - **Prereq- EF 151 or 157**
  - **Prereq- EF 151 or 157**
  - **Prereq- Math 141 or 147**
  - **BSE 201 (1) FA**

#### Spring
- **15 hours**
  - **Math 231 or 237 (3) FA, SP, SU**
  - **Biology 160 or 168 (3) FA, SP, SU**
  - **ME 321 (3) FA, SP, SU**
  - **BSE 201 (1) FA**
  - **Prereq- EF 151 or 157**
  - **Prereq- Math 141 or 147**
  - **Prereq- Math 142 or 148**
  - **Prereq- EF 152 or 158**

#### Fall
- **17 hours**
  - **BSE 411 or 417 (3) SP**
  - **BSE 431 or 437 (3) SP**
  - **Chem 360 or 368 (3) FA, SP, SU**
  - **Prereq- BSE 321 with grade of C or better**
  - **Prereq- BSE 321 with grade of C or better**
  - **Prereq- BSE 321 with grade of C or better**

#### Spring
- **15 hours**
  - **Econ 201 or 207 (4) FA, SP, SU**
  - **BSE 400 (2) FA**
  - **BSE 404 (3) FA**
  - **BSE 404 (3) (OC) FA**
  - **Prereq- Three of BSE 411/417, 431/437, 451/457**
  - **Prereq- Three of BSE 411/417, 416/418 or CE 495,498,431,451**
  - **Prereq- BSE 201 with C or better**
  - **Prereq- BSE 221 with C or better**

#### BSE Graduation requirements:
- a) achieve at least a 2.0 GPA in all BSE courses;
- b) only one BSE course with a grade of D+, or D may be used toward graduation;
- c) no BSE course with a grade of D- may be used for graduation;
- d) achieve at least a 2.0 GPA in the required math courses.

#### UTRACK Milestones:

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
<th>Term 5</th>
<th>Term 6 through 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 130 or higher or one SS or one 400 or one CC</td>
<td>Math 130 or higher</td>
<td>EF 151/157 or Physics 130/137</td>
<td>EF 152/158 or Physics 130/137</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
<td>No Milestones</td>
</tr>
</tbody>
</table>

Students also have opportunities for an Honors Concentration. See the Undergraduate Catalog for details and requirements.
### Chemical and Biomolecular Engineering Catalog 2017

#### Fall (15 hours)
- **Math 141** or **147 (4) FA, SP, SU**
- **Chem 120 or 128 (4) FA, SP, SU**
- **Math 130**
- **English 101 or 118 (3) FA, SP, SU**
- **EF 151 or 157 (4) FA, SP**
- **Chem 120 or 128**
- **EF 105 (1) FA, SP**
- **Prereq- Math 130 or Math ACT 28 or Math SAT 630**

#### Spring (15 hours)
- **Math 142 or 148 (4) FA, SP, SU**
- **Chem 130 or 138 (4) FA, SP, SU**
- **English 102 or 118 (3) FA, SP, SU**
- **EF 151 or 157 (4) FA, SP**
- **Chem 130 or 138**

#### Fall (15 hours)
- **Math 231 or 237 (3) FA, SP, SU**
- **Chem 250 (3) FA**
- **Bio 146 (3) FA, SP**
- **EF 151 or 157 (4) FA, SP**
- **Prereq- EF 151 or 157**
- **Coreq- Math 141 or 147**

#### Spring (15 hours)
- **Chem 360 or 368 (3) FA, SP, SU**
- **Chem 370 or 378 (3) FA, SP, SU**
- **Chem 380 (1) SP**
- **Chem 390 (1) SP**
- **Physics 231 (3) FA, SP, SU**
- **Physics 232 (3) FA, SP, SU**
- **EO 230 (2) FA, SP**

#### Fall (16 hours)
- **Math 141 or 147 (4) FA, SP, SU**
- **Chem 120 or 128 (4) FA, SP, SU**
- **Math 130**
- **English 101 or 118 (3) FA, SP, SU**
- **EF 151 or 157 (4) FA, SP**
- **Chem 120 or 128**
- **EF 105 (1) FA, SP**
- **Prereq- Math 130 or Math ACT 28 or Math SAT 630**

#### Spring (15 hours)
- **Math 142 or 148 (4) FA, SP, SU**
- **Chem 130 or 138 (4) FA, SP, SU**
- **English 102 or 118 (3) FA, SP, SU**
- **EF 151 or 157 (4) FA, SP**
- **Chem 130 or 138**

#### Fall (15 hours)
- **Chem 250 (4) SP, SU**
- **Chem 250 or 259 (4) FA, SP, SU**
- **EF 151 or 157 (4) FA, SP**
- **Prereq- EF 151 or 157**
- **Coreq- Math 141 or 147**

#### Spring (16 hours)
- **Chem 250 (4) FA, SU**
- **EF 151 or 157 (4) FA, SP**
- **Prereq- EF 151 or 157**
- **Coreq- Math 141 or 147**

### Prerequisites and Restrictions
- **Math 130 or Math ACT 28 or Math SAT 630**
- **Chem 120 or 128**
- **Math 141 or 147**
- **EF 151 or 157**
- **Coreq- Math 141 or 147**

### Progression to Upper Division
- **Students who have completed CBE 201, CBE 235, CBE 240, and CBE 250 with a grade of C or better in each course and an overall GPA of 2.3 or better.**

### Provisional Status
- **Students who have completed CBE 201, CBE 235, CBE 240, and CBE 250 with an overall GPA of at least 2.3 may apply for provisional status. Any student granted provisional status must retake the 200 level CBE course or courses in which a grade less than C was earned and achieve a C or better to be admitted to full upper-division status. Grades of C or better in these four courses are required for graduation.**

### UTRACK Milestones
- **Term 1:**
  - **Math 130 or higher or one SS or one AH or one CC**
- **Term 2:**
  - **Math 130 or higher**
- **Term 3:**
  - **EF 151/157 or Physics 139/137**
- **Term 4:**
  - **EF 151/157 or Physics 139/137**
- **Term 5:**
  - **ME 202 or CS 102 or MSE 201 or CBE 201**
- **Term 6 through 8:**
  - **No Milestones**
### Chemical and Biomolecular Engineering Catalog 2017

#### Biomolecular Concentration

<table>
<thead>
<tr>
<th>Term</th>
<th>Courses</th>
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<tbody>
<tr>
<td>Fall</td>
<td><strong>15 hours</strong></td>
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<tr>
<td></td>
<td>Math 141 or 147 (4) FA, SP, SU</td>
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<tr>
<td></td>
<td>Chem 120 or 128 (4) FA, SP, SU</td>
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<td></td>
<td>(Prep: Chem 110 or Math 130)</td>
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<tr>
<td></td>
<td>English 101 or 103 (3) FA, SP, SU</td>
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<td></td>
<td>(Prep: English 101 or 111)</td>
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<tr>
<td></td>
<td>EF 151 or 152 (4) FA, SP</td>
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<td></td>
<td>(Prep: EF 150 or Physics 135/138)</td>
</tr>
<tr>
<td></td>
<td><strong>15 hours</strong></td>
</tr>
<tr>
<td>Spring</td>
<td>Math 142 or 148 (4) FA, SP, SU</td>
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<td></td>
<td>(Prep: Math 141 or 147)</td>
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<tr>
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<td>Chem 130 or 138 (4) FA, SP, SU</td>
</tr>
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<td></td>
<td>(Prep: Chem 130 or 138)</td>
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<tr>
<td></td>
<td>English 102 (3) FA, SP, SU</td>
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<td>(Prep: English 101 or 111)</td>
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<tr>
<td></td>
<td>EF 152 or 154 (4) FA, SP</td>
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<tr>
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<td>Math 231 or 237 (5) FA, SP, SU</td>
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<tr>
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<tr>
<td></td>
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<tr>
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<td>CBE 233 (2) FA, SP</td>
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<td>(Prep: EF 152/158 &amp; Chem 130/138)</td>
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<tr>
<td></td>
<td>Coreq: Biology 160 or 168</td>
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<td>Spring</td>
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<tr>
<td></td>
<td>Math 241 or 247 (4) FA, SP, SU</td>
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<td>(Prep: Math 142 or 148)</td>
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<tr>
<td></td>
<td>CBE 239 (4) FA, SP</td>
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<tr>
<td></td>
<td>(Prep: EF 152/158 &amp; Chem 130/138)</td>
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<tr>
<td></td>
<td>CBE 240 (4) SP, SU</td>
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<td>(Prep: EF 152/158 &amp; Chem 130/138)</td>
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<td>Coreq: Math 241 or 247</td>
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<tr>
<td></td>
<td>Chemistry 260 or 268 (3) FA, SP, SU</td>
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<td></td>
<td>CBE 391 (3) FA, SP</td>
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<td>CBE 349 (9) FA, SP, SU</td>
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<td>Fall</td>
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<tr>
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<td>CBE 445 (5) FA, SP</td>
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<tr>
<td></td>
<td>CBE 481 (1) SP</td>
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<td></td>
<td>(Prep: CBE 392 or 440 or 490)</td>
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<td></td>
<td>Coreq: CBE 455 or 490</td>
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<td></td>
<td>CBE 488 or 499 (3) SP (OC)</td>
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<td>(Prep: CBE 445 or 490)</td>
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<td></td>
<td>*Bio Option I (3-8) FA, SP, SU</td>
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</tbody>
</table>

### Restrictions:
- 2.3 GPA
- Grades of C- or better in these four courses are required for graduation.

### Upper-Division Status
A lower-division student must apply for progression to upper division status after completing CBE 201, CBE 235, CBE 240, and CBE 250 with a grade of C- or better in each course and an overall GPA of 2.3 or better.

### Provisional Status
Students who have completed CBE 201, CBE 235, CBE 240, and CBE 250 with an overall GPA of at least 2.3 may apply for provisional status. Any student granted provisional status must receive the 200 level CBE course or courses in which a grade less than C- was earned and achieve a C- or better to be admitted to full upper-division status. Grades of C- or better in these four courses are required for graduation. 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 (including the four required for upper-division status). Permission to continue with upper-division classes depends on this minimum level of performance. Students who have completed CBE 201, CBE 235, CBE 240, and CBE 250 with an overall GPA below 2.3 will not be admitted to upper-division chemical and biomolecular engineering courses. Students who have not been admitted to upper-division or provisional status will be dropped from upper-division departmental classes.

Students also have opportunities for an Honors Concentration. See the Undergraduate Catalog for details and requirements.

### UTRACK Milestones:

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Math 130 or higher in one SS or one AH in one OC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term 2</td>
<td>Math 130 or higher</td>
</tr>
<tr>
<td>Term 3</td>
<td>EF 151/157 or Physics 135/138</td>
</tr>
<tr>
<td>Term 4</td>
<td>EF 152/158 or Physics 135/138</td>
</tr>
<tr>
<td>Term 5</td>
<td>ME 202 or CS 110 or MSE 201</td>
</tr>
<tr>
<td>Term 6</td>
<td>through 8</td>
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</table>

# Civil Engineering Catalog 2017

## Fall

<table>
<thead>
<tr>
<th>Hours</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>English 101 or 118 (3) FA, SP, SU  \nChem 120 or 128 (4) FA, SP, SU  \nMath 130  \nMath 141 or 147 (4) FA, SP, SU  \nEF 151 or 157 (4) FA, SP  \nEF 152 or 158 (4) FA, SP, SU</td>
</tr>
<tr>
<td>16</td>
<td>Math 231 or 237 (3) FA, SP, SU  \nSTA 231 (3) FA, SP, SU  \nECOD 251 or 257 (4) FA, SP, SU  \nME 251 (3) FA, SP, SU  \nCE 251 (3) FA, SP</td>
</tr>
<tr>
<td>15-16</td>
<td>Gen Ed (3) FA, SP, SU  \nGen Ed (3) FA, SP, SU  \nGen Ed (3) FA, SP, SU</td>
</tr>
<tr>
<td>16</td>
<td>Gen Ed (3) FA, SP, SU  \nCE Concen. Elective **(3) FA, SP, SU  \nCE Concen. Lab **(1) FA, SP, SU  \nTechnical Elective ***(3) FA, SP, SU</td>
</tr>
<tr>
<td>15</td>
<td>Gen Ed (3) FA, SP, SU  \nCE Concen. Elective **(3) FA, SP, SU  \nCE Concen. Lab **(1) FA, SP, SU  \nTechnical Elective ***(3) FA, SP, SU</td>
</tr>
</tbody>
</table>

### Prerequisites
- Math 130 or Math ACT 28 or Math SAT 630
- EF 151 or 157
- Chemistry 130 or Chemistry 131
- Social Science

**Science Elective:** Students select from Biology 101, 102, 150 or 158, 180 or 168; Geography 131; Geology 101, 103, 107; Environ.Engineering 513; Environ. Soil Science 462.

**CE Concentration Electives/Labs:** Students must select 2 of the following concentration sequences: environmental (CE 481 or 487, CE 482), geotechnical (CE 430 or 437, CE 432), structural (CE 461 or 467, CE 463), transportation (CE 451 or 453, CE 455), construction (CE 441 or 448).

**Technical Electives:** All areas

### Milestones

<table>
<thead>
<tr>
<th>Term</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Math 130 or higher or one SS or one AH or one CC</td>
</tr>
<tr>
<td>2</td>
<td>Math 130 or higher</td>
</tr>
<tr>
<td>3</td>
<td>EF 151/157 or Physics 135/137</td>
</tr>
<tr>
<td>4</td>
<td>EF 152/158 or Physics 136/138</td>
</tr>
<tr>
<td>5</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
</tr>
<tr>
<td>6</td>
<td>No Milestones</td>
</tr>
</tbody>
</table>

### Civil Graduation Requirements

Students are required to maintain a cumulative grade point of at least 2.0 in all civil and environmental engineering courses taken at the University of Tennessee, Knoxville, used to satisfy the graduation requirements.

Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.
### Engineering Majors

**Department of Electrical Engineering and Computer Science**  
Computer Engineering Catalog 2017

<table>
<thead>
<tr>
<th>Term</th>
<th>Fall 15 hours</th>
<th>Spring 15 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Math 141 or 147 (4) FA, SU</td>
<td>EF 151 or 157 (4) FA, SP</td>
</tr>
<tr>
<td></td>
<td>Prereq: Math 130 or Math ACT 28 or Math SAT 635</td>
<td>Prereq: Math 141 or 147 and EF 105 or CS 102</td>
</tr>
<tr>
<td></td>
<td>CS 102 (4) FA, SP, SU</td>
<td>CS 130 (4) FA, SP, SU (formerly CS 160)</td>
</tr>
<tr>
<td></td>
<td>Prereq: EF 152 or CS 102</td>
<td>Prereq: CS 102</td>
</tr>
<tr>
<td></td>
<td>English 101 or 118 (3) FA, SP, SU</td>
<td>English 102 (2) FA, SP, SU</td>
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<td>Prereq: English 91 or 118</td>
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<table>
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<tr>
<th>Term</th>
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<th>Spring 18 hours</th>
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<tbody>
<tr>
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<td>Math 231 or 237 (3) FA, SP, SU</td>
<td>Math 235 (3) FA, SP, SU</td>
</tr>
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<td>Prereq: Math 142 or 148</td>
<td>Prereq: CS 130 (formerly CS 160)</td>
</tr>
<tr>
<td></td>
<td>Physics 231 (3) FA, SP, SU</td>
<td>Prereq: Coreq: Math 142 or 148</td>
</tr>
<tr>
<td></td>
<td>Prereq: EF 152/158 grades C or better</td>
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<tr>
<td></td>
<td>CS 140 (4) FA, SP</td>
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<td>Prereq: CS 150 (formerly CS 160)</td>
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<td>Physics 232 (4) FA, SP, SU</td>
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<td>Prereq: Physics 231</td>
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</tr>
<tr>
<td></td>
<td>Math 251 or 257 (3) FA, SP, SU</td>
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<td>Prereq: Math 142 or 148</td>
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<tr>
<td></td>
<td>Physics 233/237 (3) FA, SP</td>
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<tr>
<td></td>
<td>Chem 120 or 128 (4) FA, SP, SU</td>
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<td></td>
<td>Math 130</td>
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<tr>
<th>Term</th>
<th>Fall 17 hours</th>
<th>Spring 15 hours</th>
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<tbody>
<tr>
<td></td>
<td>ECE 335 (3) FA, SU</td>
<td>ECE 351 (3) FA, SU</td>
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<td>CS 361 (3)</td>
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<td>Arts and Humanities</td>
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<tr>
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<td>ECE 401 (2) FA</td>
<td>ECE 452 (3) FA, SU</td>
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<td>Prereq: ECE 407</td>
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<td>ECE 451 or 457 (3) FA, SP</td>
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<tr>
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<td>Social Science</td>
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</table>

### Notes:

* Among the five Computer Engineering Upper Division Electives, you must choose courses that cover 3 tracks with one of the tracks being Networking & Embedded Systems.

The course distribution among the 3 tracks should follow the 2-2-1 pattern, among which at most 2 courses can be at the 3xx-level.

The following listing is the acceptable set of electives that may be taken to satisfy the upper division electives for the Computer Engineering major. The electives have been grouped into 8 suggested tracks.

The tracks group related electives that a student may wish to take in order to achieve a level of expertise in the indicated area. The 5xx-level courses are listed as suggestions to students admitted in the five-year BS/MS program.

**Networking & Embedded Systems**
- ECE 453, ECE 455, ECE 461, ECE 462, ECE 463, CS 531, ECE 553, ECE 555, ECE 556, Signals and Systems: ECE 431, 451, 492, 471 or 477, 472 or 478, 505, 506, 571, 572.

**Machine Learning & Artificial Intelligence**

**Progression**

The department requires at least a C in every computer engineering, computer science, electrical engineering, and mathematics course used for the undergraduate degrees. ECE 201 requires a C or better in EF 152/158 and Math 142/148.

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, 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 ECE 300 (ECE 201-202) will be evaluated during the semester they are registered for it. Transfer students for whom ECE 300 (ECE 201-202) 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.

Students also have opportunities for an Honors Concentration and/or a five-year BS/MS program. See the Undergraduate Catalog for details and requirements.

**UTRACK Milestones**

<table>
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<tr>
<th>Term</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6 through 8</th>
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<tbody>
<tr>
<td>Math</td>
<td>130 or higher or one SS or one AH or one CC</td>
<td>Math 130 or higher</td>
<td>EF 151/157 or Physics 135/137</td>
<td>EF 152/158 or Physics 136/138</td>
<td>ME 202 or CS 102 or MSE 201</td>
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### Department of Electrical Engineering and Computer Science

#### Computer Science Catalog 2017

**Fall 15-16 hours**

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<th>Credits</th>
<th>Term</th>
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</thead>
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<tr>
<td>Physics 125/137 or 151/155</td>
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<td>English 101 or 118</td>
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**Spring 15-16 hours**

<table>
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<th>Course</th>
<th>Credits</th>
<th>Term</th>
<th>Prereq</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 130 (formerly CS 160)</td>
<td>4</td>
<td>FA, SP</td>
<td>Coreq: CS 102</td>
</tr>
<tr>
<td>Math 142 or 147</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics 126/138 or EF 151/158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 102</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Fall 14-15 hours**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Term</th>
<th>Prereq</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 140</td>
<td>4</td>
<td>FA, SP</td>
<td>Prereq: CS 130</td>
</tr>
<tr>
<td>Gen. Ed.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Math 241 or 247</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Biology 131 or 135</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry 100 or 129/128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 102</td>
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</table>

**Spring 13 hours**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Term</th>
<th>Prereq</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 160 or 307</td>
<td>4</td>
<td>FA, SP</td>
<td>Coreq: CS 140</td>
</tr>
<tr>
<td>CS 311 or 317</td>
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</tr>
<tr>
<td>Math 251 or 257</td>
<td></td>
<td></td>
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**Fall 16 hours**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Term</th>
<th>Prereq</th>
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<tbody>
<tr>
<td>CS 349 (formerly CS 367)</td>
<td>4</td>
<td>SP</td>
<td>Coreq: CS 330 or 332</td>
</tr>
<tr>
<td>CS 312</td>
<td></td>
<td></td>
<td>Prereq: CS 311</td>
</tr>
<tr>
<td>CS Upper Division Elective</td>
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</tr>
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**Spring 15 hours**

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CS 456</td>
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<td>CS Upper Division Elective</td>
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</tr>
<tr>
<td>Gen. Ed.</td>
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</table>

The following list shows an acceptable set of electives that may be taken to satisfy the upper division electives for the CS major. The electives have been grouped into 7 suggested tracks. The tracks group related electives that a student may wish to take in order to achieve a level of expertise in the indicated area. However, it is not mandatory to take any track and students are free to mix and match courses from different tracks to fit their specific interests.

**Theory**
- CS 440, 482
- Systems: CS 436, 461, 462, 463
- Software: CS 365, 451, 455
- Hardware: ECE 451, 455
- Scientific Computing: CS 370 or 377, 471, 472
- Math 231 or 237
- Artificial Intelligence: CS 420 or 427, 425

Computer Science 493 and 494 may be taken to satisfy the upper division electives. Up to two (2) Computer Science 5xx or Electrical Computer Engineering 5xx courses may count as upper division electives.

**Progression**

The department requires at least a C in every computer engineering, computer science, electrical engineering and mathematics 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 also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.

**UTRACK Milestones:**

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
<th>Term 5</th>
<th>Term 6 through 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 130 or Higher or one SS or one A4H or one CC</td>
<td>Math 130 or Higher</td>
<td>Math 135/157 or Physics 135/137</td>
<td>Math 152/158 or Physics 135/137</td>
<td>CBE 312 or CS 102 or MSE 201</td>
<td>No Milestones</td>
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### Engineering Majors

**Department of Electrical Engineering and Computer Science**

**Electrical Engineering Catalog 2017**

<table>
<thead>
<tr>
<th>Term</th>
<th>Courses</th>
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<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>Math 141 or 147 (4) FA, SP, SU  EF 151 or 157 (4) FA, SP  CS 102 (4) FA, SP, SU  English 101 or 118 (3) FA, SP, SU</td>
</tr>
<tr>
<td>15 hours</td>
<td>Prereq: Math 130 or Math 28 ACT or Math 630 SAT  Coreq: Math 141 or 147</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>Math 142 or 148 (4) FA, SP, SU  EF 152 or 158 (4) FA, SP  CS 130 (4) FA, SP (formerly CS 160)</td>
</tr>
<tr>
<td>15 hours</td>
<td>Prereq: Math 141 or 147  Coreq: CS 102</td>
</tr>
</tbody>
</table>

**Fall**

- Math 231 or 237 (3) FA, SP, SU  ECE 255 (3) FA, SP, SU  Physics 231 (3) FA, SP, SU  Chem 120 or 128 (4) FA, SP, SU  ECE 201.5 FA, SP, SU
- Prereq: Math 142 or 148  Coreq: Math 142 or 148  Math 130
- EF 151 or 157  EF 152 or 158  Math 142 or 148
- Petition required in advance

**Spring**

- Math 241 or 247 (4) FA, SP, SU  Math 251 or 267 (3) FA, SP, SU  Physics 232 (4) FA, SP  ECE 315 or 317 (3) FA, SP  ECE 202.5 FA, SP, SU
- Prereq: Math 142 or 148  Coreq: Math 241 or 247
- Senior Elective
- Arts and Humanities

**Fall**

- ECE 315 (3) FA, SU  ECE 325 (3) FA, SP  ECE 335 (3) FA, SP, SU  ECE 341 or 347 (3) FA, SP  ECE 395 (1) FA, SP, SU
- Prereq: ECE 202  Prereq: ECE 202  Prereq: ECE 202, Math 241 or 247 and Physics 232
- Physics 135/137  CBE 201
- or one AH or one CC

**Spring**

- ECE 316 (3) SP, SU  ECE 336 (3) SP, SU  ECE 342 (3) FA, SP, SU  Gen. Ed. (3) FA, SP, SU  Gen. Ed. (3) FA, SP, SU
- Prereq: ECE 335  Coreq: ECE 315  Prereq: ECE 313, 315  Gen. Ed. (3) FA, SP, SU  Gen. Ed. (3) FA, SP, SU
- Social Science  Arts and Humanities

**Fall**

- ECE Sr. Elective (1) FA, SP, SU  ECE Sr. Elective (1) FA, SP, SU  ECE Sr. Elective (1) FA, SP, SU  ECE 401 (2) FA  Gen. Ed. (3) FA, SP, SU
- Prereq: ECE 302  Prereq: ECE 315 or 317
- Physics 135/137
- or one AH or one CC

**Spring**

- Tech. Elective (1) FA, SP, SU  ECE 452 (3) OC&WC (3) SP  Gen. Ed. (3) FA, SP, SU  Gen. Ed. (3) FA, SP, SU
- Tech. Elective (1) FA, SP, SU  ECE 495 (2) FA  Gen. Ed. (3) FA, SP, SU  Gen. Ed. (3) FA, SP, SU
- Arts and Humanities  Culture and Civilization

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**Acceptable Senior Electrical and Computer Engineering courses**: Choose 12 credit hours of ECE senior electives with Advisor's consent. Up to 2 COSC 5XX or ECE 5XX courses may count as upper division electives. Acceptable ECE senior electives are ECE 4XX courses that are not otherwise required for the degree.

**Technical Electives**: Computer Science 140, 311 or Math 300, CS 370; Chemistry 130/138, Industrial 405, 457; Materials Science and Engineering 201/207, 410; Mechanical Engineering 231, 321, 331, 344, 363/367; Nuclear Engineering 342/347.

### Progression

The department requires at least a C in every computer engineering, computer science, electrical engineering, and mathematics course used for the undergraduate degrees. ECE 201 requires a C or better in EF 152/158 and Math 142/148.

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 ECE 300 (now ECE 201-202) will be evaluated during the semester they are registered for it. Transfer students for whom ECE 300 (now ECE 201-202) 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.

Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.

### UTRACK Milestones:

<table>
<thead>
<tr>
<th>Term</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Math 130 or higher or one SS or one AH or one CC</td>
</tr>
<tr>
<td>2</td>
<td>Math 130 or higher</td>
</tr>
<tr>
<td>3</td>
<td>EF 151/157 or Physics 135/137</td>
</tr>
<tr>
<td>4</td>
<td>EF 152/158 or Physics 130/138</td>
</tr>
<tr>
<td>5</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
</tr>
<tr>
<td>6</td>
<td>No Milestones</td>
</tr>
</tbody>
</table>

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**UTRACK Milestones**: UTRACK Milestones are used to track the progress of students in the engineering major. The milestones are designed to ensure that students are on track to meet the requirements for their degree. The milestones are divided into terms, and each term has specific courses that students must complete to progress to the next term. The milestones are used to ensure that students are on track to meet the requirements for their degree.

---

**Progression**

The department requires at least a C in every computer engineering, computer science, electrical engineering, and mathematics course used for the undergraduate degrees. ECE 201 requires a C or better in EF 152/158 and Math 142/148.

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Students who take ECE 300 (now ECE 201-202) will be evaluated during the semester they are registered for it. Transfer students for whom ECE 300 (now ECE 201-202) 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.

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<tr>
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<tbody>
<tr>
<td>1</td>
<td>Math 130 or higher or one SS or one AH or one CC</td>
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<tr>
<td>2</td>
<td>Math 130 or higher</td>
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<tr>
<td>3</td>
<td>EF 151/157 or Physics 135/137</td>
</tr>
<tr>
<td>4</td>
<td>EF 152/158 or Physics 130/138</td>
</tr>
<tr>
<td>5</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
</tr>
<tr>
<td>6</td>
<td>No Milestones</td>
</tr>
</tbody>
</table>

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**Progression**

The department requires at least a C in every computer engineering, computer science, electrical engineering, and mathematics course used for the undergraduate degrees. ECE 201 requires a C or better in EF 152/158 and Math 142/148.

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 ECE 300 (now ECE 201-202) will be evaluated during the semester they are registered for it. Transfer students for whom ECE 300 (now ECE 201-202) 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.

Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.

### UTRACK Milestones:

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<thead>
<tr>
<th>Term</th>
<th>Courses</th>
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<tbody>
<tr>
<td>1</td>
<td>Math 130 or higher or one SS or one AH or one CC</td>
</tr>
<tr>
<td>2</td>
<td>Math 130 or higher</td>
</tr>
<tr>
<td>3</td>
<td>EF 151/157 or Physics 135/137</td>
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<tr>
<td>4</td>
<td>EF 152/158 or Physics 130/138</td>
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<tr>
<td>5</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
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### Department of Electrical Engineering and Computer Science

#### Electrical- Power & Energy Systems Concentration Catalog 2017

<table>
<thead>
<tr>
<th>Term</th>
<th>Courses</th>
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</table>
| **Fall 15 hours** | Math 141 or 147 (4) FA, SP, SU  
Prereq: Math 130 or Math 28 ACT or Math 630 SAT  
Coreq: Math 141 or 147 and EF 105 or CS 102  
English 101 or 118 (3) FA, SP, SU |
| **Spring 15 hours** | Math 142 or 148 (4) FA, SP, SU  
Prereq: Math 141 or 147  
Coreq: EF 151 or 157  
CS 102 (4) FA, SP  
Prereq: CS 102 (CS 130 formerly CS 160)  
English 102 (3) FA, SP, SU |
| **Fall 16 hours** | Math 231 or 237 (3) FA, SP, SU  
Prereq: Math 142 or 148  
ECE 255 (3) FA, SP, SU  
Prereq: CS 130  
Physics 231 (3) FA, SP, SU  
Prereq: Physics 231  
Chem 120 or 128 (4) FA, SP, SU  
Prereq: Math 130  
ECE 201 (3) FA, SP, SU  
Prereq: EF 152/158 and Math 142/148  
Coreq: Math 231, access FORM |
| **Spring 17 hours** | Math 241 or 247 (4) FA, SP, SU  
Prereq: Math 142 or 148  
ECE 241 or 247 (3) FA, SP, SU  
Prereq: Physics 231  
ECE 313 or 317 (3) FA, SP  
Prereq: Math 142 or 148  
ECE 202 (3) FA, SP, SU  
Prereq: 201 |
| **Fall 16 hours** | ECE 315 (3) FA, SU  
Prereq: ECE 202  
ECE 325 (3) FA, SP  
Prereq: ECE 202  
ECE 335 (3) FA, SP  
Prereq: ECE 202  
ECE 341 or 347 (3) FA, SP  
Prereq: ECE 202, Math 241 or 247 and Physics 232  
ECE 35S (5) FA, SP  
Prereq: ECE 202  
Gen. Ed. (3) FA, SP, SU  
Social Science |
| **Spring 15 hours** | ECE 316 (3) SP, SU  
Prereq: ECE 315  
ECE 336 (3) FA, SP  
Prereq: ECE 335  
Coreq: ECE 315  
ECE 342 (3) FA, SP  
Prereq: ECE 313, 315  
Gen. Ed. (3) FA, SP, SU  
Social Science  
Gen. Ed. (3) FA, SP, SU  
Arts & Humanities  
Gen. Ed. (3) FA, SP, SU  
Cultures and Civilizations |
| **Fall 17 hours** | ECE Sr. Elective (3) FA, SP  
Senior Elective  
ECE Sr. Elective (3) FA, SP  
Senior Elective  
Power Elective(3) FA, SP  
Prereq: ECE 401 (2) FA  
Prereq: ECE 315 or 351  
Gen. Ed. (3) FA, SP, SU  
Arts and Humanities  
Gen. Ed. (3) FA, SP, SU  
Cultures and Civilizations |
| **Spring 16 hours** | Economic, Entrepreneurship and Innovation Elective (3) FA, SP  
Tech. Elective(3) FA, SP  
Power Elective(3) FA, SP  
ECE 402 (OC&W) (3) SP  
Prereq: ECE 401  
Gen. Ed. (3) FA, SP, SU  
Cultures and Civilizations  
ECE 496 (1) SP  
Prereq: ECE 325 |

**Senior ECE electives:** Choose 6 credit hours of ECE senior elective with Advisor’s consent. Up to 2 COSC 5XX or ECE 5XX courses may count as upper division electives. Acceptable senior electives are ECE 4XX courses that are not otherwise required for the degree.

**Power & Energy System Electives:** ECE 415, ECE 421, ECE 422, ECE 481, ECE 482, ECE 521, ECE 522, ECE 523, ECE 525.

**Technical Electives:** COSC 140, COSC 311 or MATH 300, COSC 370, CHEM 130/138, IE 405, MSE 201/207, MSE 410, ME 231, ME 321, ME 331, ME 344, NE 342 or NE 347.

**Economic, Entrepreneurship, and Innovation Elective:** Choose from IE 405, IE 457 (or ME 457), IE 518, IE 527 (or ME 519), MGT 552, or MGT 560.

**Progression**

The department requires at least a C in every computer engineering, computer science, electrical engineering, and mathematics course used for the undergraduate degrees. ECE 201 requires a C or better in EF 152/158 and Math 142/148.

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 ECE 300 (now ECE 201-202) will be evaluated during the semester they are registered for it. Transfer students for whom ECE 300 (now ECE 201-202) 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.

Students also have opportunities for an Honors Concentration and/or a five-year BS/MS program. See the Undergraduate Catalog for details and requirements.

**UTRACK Milestones:**

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
<th>Term 5</th>
<th>Term 6 through 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 130 or higher or one SS or one AH or one CC</td>
<td>Math 130 or higher</td>
<td>EF 151/157 or Physics 135/137</td>
<td>EF 152/158 or Physics 136/138</td>
<td>ME 202 or CS 102 or MSE 201 or CBBE 201</td>
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</table>
## Engineering Majors Catalog 2017

### Industrial Engineering Catalog 2017

<table>
<thead>
<tr>
<th>Fall 16 hours</th>
<th>Math 141 or 147 (4) FA, SP, SU</th>
<th>Engineering Majors Catalog 2017</th>
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<tbody>
<tr>
<td></td>
<td>Prereq: Math 130 or Math ACT 28</td>
<td>Math 120 or 128 (4) FA, SP, SU</td>
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<tr>
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<td>or Math SAT 630</td>
<td>Math 130</td>
</tr>
<tr>
<td></td>
<td>EF 151 or 157 (4) FA, SP</td>
<td>EF 105 (1) FA, SP</td>
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<td></td>
<td>Coreq: Math 141 or 147 and</td>
<td>Coreq: EF 151 or 157</td>
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### Industrial Majors Only

<table>
<thead>
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<th>IE 250 (1) FA</th>
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<tbody>
<tr>
<td></td>
<td>Prereq:IE-250</td>
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<table>
<thead>
<tr>
<th>Spring 15 hours</th>
<th>Math 231 or 237 (3) FA, SP, SU</th>
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<tbody>
<tr>
<td></td>
<td>Prereq: Math 142 or 148</td>
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<table>
<thead>
<tr>
<th>Fall 16 hours</th>
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<tbody>
<tr>
<td></td>
<td>Prereq:IE-350</td>
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<td>Minimum level - Senior</td>
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<table>
<thead>
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<th>Spring 15 hours</th>
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<tr>
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<table>
<thead>
<tr>
<th>Spring 15 hours</th>
<th>Engineering Science Elective***</th>
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<td></td>
<td>Prereq:IE-300 or Stats 251</td>
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### Arts & Humanities

<table>
<thead>
<tr>
<th>Fall 15 hours</th>
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<tbody>
<tr>
<td></td>
<td>Prereq:IE-450</td>
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<tr>
<td></td>
<td>Minimum level - Senior</td>
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<table>
<thead>
<tr>
<th>Spring 17 hours</th>
<th>IE 422 (2) O &amp; WC FA, SP</th>
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<tbody>
<tr>
<td></td>
<td>Prereq: 404 and English 102 or 118</td>
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<table>
<thead>
<tr>
<th>Spring 15 hours</th>
<th>IE 406 (2) FA, SP</th>
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<tbody>
<tr>
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<td>Prereq:IE-406</td>
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<td>Coreq:IE-406 &amp; 408</td>
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<table>
<thead>
<tr>
<th>Spring 15 hours</th>
<th>IE 427 (3) SP</th>
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<tbody>
<tr>
<td></td>
<td>Prereq:IE-427</td>
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### Engineering Science Electives

- *Technical Elective (3) FA, SP*
- *Industrial Elective (3) FA, SP*
- *Cultures and Civilizations*
- *Arts and Humanities*

### Physical Education

<table>
<thead>
<tr>
<th>Fall 15 hours</th>
<th>EF 151/157 or Physics 135/137</th>
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<table>
<thead>
<tr>
<th>Spring 15 hours</th>
<th>IE 152/158 or Physics 136/138</th>
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<table>
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<tr>
<th>Spring 15 hours</th>
<th>ME 202 or CS 102 or MSE 201</th>
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<table>
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<th>IE 200 or Stats 251</th>
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### UTRACK Milestones

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Math 130 or higher or one SS</th>
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<tbody>
<tr>
<td></td>
<td>or one AH or one CC</td>
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</table>

| Term 2          | Math 130 or higher          |

| Term 3          | EF 151/157 or Physics 135/137 |

| Term 4          | EF 152/158 or Physics 136/138 |

<table>
<thead>
<tr>
<th>Term 5</th>
<th>ME 202 or CS 102 or MSE 201</th>
</tr>
</thead>
</table>

| Term 6 through 8| No Milestones       |

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*Technical Electives chosen from AE 341 or 347; BUAD 361; BUAD 410; BULW 301; COSC 102; ECE 255; ECE 302; ECON 311; ECON 312; ECON 313; ECON 322; ECON 331; ECON 333; ECON 351; ECON 361; FINC 300; FINC 425; FINC 455; IE 223; IE 430; IE 451; IE 457; IE 483; IE 484; INSC 310; INSC 451; MARK 300; MGT 300; MSE 302; MSE 340 or 347; MSE 360 or 367; MSE 390 or 397; MSE 405; ME 321; ME 363 or 367; ME 365; ME 366; ME 405; ME 342 or 347; 3 credit hours of EF 333. Some courses may require a prerequisite or corequisite that is not part of the IE program.

**Industrial Electives chosen from IE 423, IE 430, IE 451, IE 457, IE 483, IE 484, IE 493, IE 494, IE 495. The same course may not be used to count for both Technical Elective and Industrial Elective.

***Engineering Science Electives chosen from ECE 301; ME 202 AND EF 130; ME 331; MSE 201 or 207.

Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.
### Materials Science and Engineering Catalog 2017

#### Fall
- **16 hours**
  - English 101 or 118 (3) FA, SP, SU
  - Chem 120 or 128 (4) FA, SP, SU
  - Math 130
  - Math 141 or 147 (4) FA, SP, SU
  - EF 151 or 157 (4) FA, SP
  - EF 105 (1) FA, SP

#### Spring
- **16 hours**
  - English 102 (3) FA, SP, SU
  - Chem 120 or 128 (4) FA, SP, SU
  - Math 141 or 147 (4) FA, SP, SU
  - EF 151 or 157 (4) FA, SP
  - MSE 101 (1) SP

### Fall
- **17 hours**
  - MSE 201 or 207 (3) FA, SP, SU
  - MSE 210 (1) FA
  - Math 241 or 247 (4) FA, SP, SU
  - Physics 231 (3) FA, SP, SU
  - Econ 201 or 207 (4) FA, SP, SU
  - EF 230 (2) FA, SP

#### Spring
- **16 hours**
  - English 102 (3) FA, SP, SU
  - Chem 130 or 138 (4) FA, SP, SU
  - Math 142 or 148 (4) FA, SP, SU
  - EF 152 or 158 (4) FA, SP
  - MSE 101 (1) SP

### Fall
- **16 hours**
  - MSE 330 (1) FA
  - ME 202 or CS 102 or MSE 201
  - Math 231 or 237 (3) FA, SP, SU
  - Physics 232 (6) FA, SP, SU
  - MSE 350 or 357 (3) SP

#### Spring
- **16 hours**
  - MSE 390 or 397 (3) SP
  - MSE 370 (3) SP
  - MSE 302 (3) SP

### Fall
- **15 hours**
  - MSE 4XX (3) FA, SP, SU
  - MSE 405 (WC) (3) FA
  - MSE 480 (3) FA

#### Spring
- **17 hours**
  - MSE 4XX (3) FA, SP, SU
  - Technical Elective* (3) FA, SP, SU

### Progression
- Progression of students to departmental upper-division courses 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 course work with an overall GPA of at least 2.4. This must include MSE 201.

### Provisional Status
- Students who have completed 50 hours of lower-division engineering curriculum course work with an overall GPA between 2.0 and 2.4 may apply for provisional status.

### MSE Graduation Requirements
- Graduation in materials science and engineering requires a minimum grade point average of 2.0 for all departmental courses.

### UTRACK Milestones
<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
<th>Term 5</th>
<th>Term 6 through 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 130 or Higher or one SS or one AH or one OC</td>
<td>Math 130 or Higher</td>
<td>EF 15/157 or Physics 139/137</td>
<td>EF 152/163 or Physics 136/138</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
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</table>

*Technical electives: ECE 301, BCMB 232, BCOL 160 or 168, BME 409; CHE 475, EF 330, any MSE course, ME 321, NE 483, NE 484, other 300 or 400 level science or engineering courses as approved by academic advisor and department head.

**MSE 4XX Electives: Materials Science and Engineering electives: 408, 410, 421, 425, 432, 440, 450, 451, 455, 457, 460, 464, 474, 484, 485, 486, 494, 495.**
# Materials Science and Engineering Catalog 2017

## BIOMATERIALS CONCENTRATION

### Fall

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>English 101 or 118 (3) FA, SP, SU</td>
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<tr>
<td>Chem 120 or 128 (4) FA, SP, SU</td>
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<td>Math 141 or 147 (4) FA, SP, SU</td>
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<tr>
<td>Physics 231 (3) FA, SP, SU</td>
</tr>
<tr>
<td>MSE 201 (1) FA</td>
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<tr>
<td>MSE 205 (1) FA, SP</td>
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<tr>
<td>MSE 210 (1) FA</td>
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### Spring

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>English 102 (3) FA, SP, SU</td>
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<tr>
<td>MSE 201 or 207 (3) FA, SP, SU</td>
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<tr>
<td>Chem 120 or 128 (4) FA, SP, SU</td>
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<tr>
<td>Math 141 or 147 (4) FA, SP, SU</td>
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<tr>
<td>Physics 231 (3) FA, SP, SU</td>
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<tr>
<td>MSE 201 (1) FA</td>
</tr>
<tr>
<td>MSE 205 (1) FA, SP</td>
</tr>
<tr>
<td>MSE 210 (1) FA</td>
</tr>
</tbody>
</table>

### Fall

<table>
<thead>
<tr>
<th>17 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 201 (1) FA</td>
</tr>
<tr>
<td>MSE 210 (1) FA</td>
</tr>
<tr>
<td>Math 241 or 247 (4) FA, SP, SU</td>
</tr>
<tr>
<td>MSE 230 (3) SP</td>
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<tr>
<td>MSE 240 (3) FA</td>
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### Spring

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>MSE 300 (1) FA</td>
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<td>MSE 301 (3) FA</td>
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<tr>
<td>MSE 302 (3) FA</td>
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<tr>
<td>MSE 340 or 347 (3) FA</td>
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<td>MSE 350 or 357 (3) FA</td>
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<tr>
<td>MSE 360 or 367 (3) FA</td>
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<tr>
<td>MSE 380 or 387 (3) SP</td>
</tr>
<tr>
<td>MSE 390 or 397 (3) SP</td>
</tr>
<tr>
<td>MSE 400 or 407 (3) SP</td>
</tr>
</tbody>
</table>

### Progression

Progression of students to departmental upper-division courses 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 course work with an overall GPA of at least 2.4. This must include MSE 201.

### Provisional Status

Students who have completed 35 hours of lower division engineering curriculum course work with an overall GPA between 2.0 and 2.4 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 2.0 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.

### MSE Graduation Requirements

Graduation in materials science and engineering requires a minimum grade point average of 2.0 for all departmental courses.

Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.
# Materials Science and Engineering Catalog 2017
## NANOMATERIALS CONCENTRATION

### Fall
- **English 101 or 118 (3) FA, SP, SU**
- **Chem 120 or 128 (4) FA, SP, SU**
- **Math 141 or 147 (4) FA, SP, SU**
  Pre-req: Math 130 or Math ACT 28 or Math SAT 650
- **EF 151 or 157 (4) FA, SP**
  Coreq: Math 141 or 147 and EF 155
- **EF 105 (1) FA, SP**

### Spring
- **English 102 (3) FA, SP, SU**
- **Chem 130 or 138 (4) FA, SP, SU**
- **Math 142 or 148 (4) FA, SP, SU**
- **EF 152 or 158 (4) FA, SP**
- **MSE 201 (1) SP**

### Fall
- **MSE 201 or 207 (3) FA, SP, SU**
- **MSE 210 (1) FA**
- **Math 241 or 247 (4) FA, SP, SU**
  Pre-req: Math 142 or 148
- **Physics 231 (3) FA, SP, SU**
  Coreq: Math 142 or 148
- **Econ 291 or 297 (4) FA, SP, SU**
  Social Science
- **MSE 250 (3) SP**
  Pre-req: Math 142 or 148, EF 230 and MSE 201

### Spring
- **MSE 290 (1) SP**
- **Math 200 (2) FA, SP**
- **Math 231 or 237 (3) FA, SP, SU**
- **Physics 232 (4) FA, SP, SU**
  Coreq: Math 231 or 237
- **MSE 260 (3) SP**
  Pre-req: EF 152/158, Chem 130/138, and Math 241/247, MSE 210

### Fall
- **MSE 300 (1) FA**
- **MSE 301 (3) FA**
  Pre-req: MSE 201 and 210
- **MSE 320 (3) FA**
  Pre-req: MSE 201 and 260
- **MSE 340 or 347 (3) FA**
  Pre-req: MSE 201
- **MSE 360 or 367 (3) FA**
  Pre-req: MSE 201
- **Gen. Ed. (3) FA, SP, SU**
  Arts and Humanities

### Spring
- **MSE 304 (2) SP**
  Pre-req: MSE 300, 340, 347, 360, and ENGS 102, 108, 130, 138, 200, or 218
- **MSE 390 or 397 (3) SP**
  Pre-req: MSE 201
- **MSE 370 (3) SP**
  Pre-req: MSE 340 and 360 and coreq: MSE 330
- **MSE 302 (3) SP**
  Pre-req: MSE 201
- **MSE 360 or 367 (3) SP**
  Pre-req: MSE 201
- **Technical Elective* (3) FA, SP, SU**
  Petition required in advance

### Fall
- **MSE 300 (1) FA**
- **MSE 385 (5) FA**
  Pre-req: Physics 232, level junior
- **MSE 405 (3) FA**
  Pre-req: Physics 232
- **MSE 480 (3) FA**
  Pre-req: MSE 201, level junior
- **Gen. Ed. (3) FA, SP, SU**
  Culture and Civilizations
- **Gen. Ed. (3) FA, SP, SU**
  Social Science

### Spring
- **MSE 408 (3) FA, SP**
  Pre-req: MSE 201
- **Technical Elective* (3) FA, SP, SU**
  Petition required in advance
- **MSE 498 (OC) (3) SP**
  Pre-req: MSE 344, 349/347, 360/367, 370, 380, 397, 400
- **Gen. Ed. (3) FA, SP, SU**
  Culture and Civilizations
- **Gen. Ed. (3) FA, SP, SU**
  Arts and Humanities

### Notes
- *Technical electives: MSE 421, 466, 474, Phys 411. Credit for other courses that address processing, structure, properties or behavior of nanomaterials may be substituted by permission of academic advisor and department head.

### Progression

**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 2.4. This must include MSE 201.

**Provisional Status**
Students who have completed 50 hours of lower division engineering curriculum coursework with an overall GPA between 2.0 and 2.4 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 2.0 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.

**MSE Graduation Requirements**
Graduation in materials science and engineering requires a minimum grade point average of 2.0 for all departmental courses. Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.

### UTRACK Milestones:

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
<th>Term 5</th>
<th>Term 6 through 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 130 or higher or one SS or one AH or one CC</td>
<td>Math 130 or higher</td>
<td>EF 151/157 or Physics 139/137</td>
<td>EF 152/158 or Physics 136/138</td>
<td>MSE 320 or CS 102 or MSE 201 or ENGS 201</td>
<td>No Milestones</td>
</tr>
</tbody>
</table>
# Mechanical Engineering Catalog 2017

## Fall

**Term 1**

- **16 hours**
  - Math 241 or 247 (4) FA, SP, SU
  - EF 151 or 157 (4) FA, SP
  - English 131 or 161 (3) FA, SP, SU
  - AE 341 or 347 (3) FA, SP, SU
  - ME 345 (3) SP
  - Math 130

**Term 2**

- **16 hours**
  - Math 311 or 317 (3) FA, SP, SU
  - EF 154 (3) SP
  - ME 365 (3) FA/SU or 463 (3) SP
  - ME 410 (2) (OC) FA
  - ME 450 (3) FA
  - Gen Ed (3) FA, SP, SU

**Term 3**

- **15 hours**
  - ME 331 (3) FA, SP, SU
  - ME 341 or 347 (3) FA, SP, SU
  - AE 345 (3) FA, SP
  - EC 341 (3) FA, SP
  - ECE 301 (3) FA, SP, M

**Term 4**

- **16 hours**
  - Math 231 or 237 (3) FA, SP, SU
  - EF 152 or 158 (4) FA, SP, SU
  - ME 202 (2) FA, SP, SU
  - English 102 (3) FA, SP, SU
  - Gen Ed (3) FA, SP, SU

**Term 5**

- **15 hours**
  - Math 130 or higher or one SS or one AH or one CC
  - ME 321 or 347 (3) FA, SP, SU
  - AE 341 or 347 (3) FA, SP, SU
  - ME 366 (3) FA, SP
  - ME 391 or 397 (3) FA, SP, SU

## Spring

**Term 1**

- **16 hours**
  - Math 130 or higher or one SS or one AH or one CC
  - ME 321 or 347 (3) FA, SP, SU
  - AE 341 or 347 (3) FA, SP, SU
  - ME 366 (3) FA, SP
  - ME 391 or 397 (3) FA, SP, SU
  - Gen Ed (3) FA, SP, SU

**Term 2**

- **16 hours**
  - Math 130 or higher or one SS or one AH or one CC
  - ME 321 or 347 (3) FA, SP, SU
  - AE 341 or 347 (3) FA, SP, SU
  - ME 366 (3) FA, SP
  - ME 391 or 397 (3) FA, SP, SU
  - Gen Ed (3) FA, SP, SU

**Term 3**

- **16 hours**
  - Math 130 or higher or one SS or one AH or one CC
  - ME 321 or 347 (3) FA, SP, SU
  - AE 341 or 347 (3) FA, SP, SU
  - ME 366 (3) FA, SP
  - ME 391 or 397 (3) FA, SP, SU
  - Gen Ed (3) FA, SP, SU

**Term 4**

- **16 hours**
  - Math 130 or higher or one SS or one AH or one CC
  - ME 321 or 347 (3) FA, SP, SU
  - AE 341 or 347 (3) FA, SP, SU
  - ME 366 (3) FA, SP
  - ME 391 or 397 (3) FA, SP, SU
  - Gen Ed (3) FA, SP, SU

## Provisional Status Progression

- Students who have completed EF 152/158, Chem 120/128, Math 231, ME 202, ME 231, and ME 321 with a grade of C or better and have an overall GPA between 2.0 and 2.4 may apply for provisional status. 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 2.0 in the first 12 hours of upper-division required engineering courses. Award of upper-division full status is dependent upon this performance. Students who have not progressed to upper-division will be dropped from departmental class rolls in upper-division courses.

## Transfer Students

- Transfer students must meet the same criteria as non-transfer students, using transfer grades for acceptable substitutions. Transfer courses with grades below a C may be accepted, but they will not be counted toward graduation.

## Departmental Academic Standing

- The faculty of the Department of Mechanical, Aerospace, and Biomedical Engineering expect all students who enter to make progress toward graduation. To graduate from the department, a student must earn a minimum grade point average of 2.0 in all departmental courses counted toward the degree. Students not meeting this requirement may petition the department for approval to drop courses or remove a grade from the GPA. Students with a cumulative GPA less than 2.0 will be dropped from the university at the end of the semester.

## ME Graduation Requirements

- A minimum GPA of 2.0 in all departmental courses counted toward the degree is required. No more than two departmental courses in which a grade of C or lower is earned may be counted toward graduation. Students with a cumulative GPA less than 2.0 will be dropped from the university at the end of the semester.

## Honors Concentration

- Students may apply for an Honors Concentration and/or a five-year B.S./M.S. program. See the Undergraduate Catalog for details and requirements.
### Nuclear Engineering Catalog 2017

#### Fall
- **16 hours**
  - **Math 141 or 147 (4)** *FA, SP, SU*
    - Prereq: Math 130 or math ACT 28 or Math SAT 630
  - **English 101 or 118 (3)** *FA, SP, SU*
    - Prereq: Math 130
  - **Chem 120 or 128 (4)** *FA, SP, SU*
    - Prereq: Chem 120 or 128
  - **EF 151 or 157 (4)** *FA, SP*
    - Prereq: EF 151 or 157
  - **EF 105 (1)** *FA, SP*
    - Prereq: EF 151 or 157

#### Spring
- **15 hours**
  - **Math 142 or 148 (4)** *FA, SP, SU*
    - Prereq: Math 141 or 147
  - **English 102 (3)** *FA, SP, SU*
    - Prereq: English 101 or 118
  - **Chem 130 or 138 (4)** *FA, SP, SU*
    - Prereq: Chem 120 or 128
  - **EF 152 or 158 (4)** *FA, SP*
    - Prereq: EF 151 or 157

#### Fall
- **16 hours**
  - **Math 231 or 237 (3)** *FA, SP, SU*
    - Prereq: Math 142 or 148
  - **NE 200 (2)** *FA*
    - Prereq: EF 151 or 157
  - **ME 202 (2)** *FA, SP, SU*
    - Prereq: Math 142 or 148
  - **Physics 231 (3)** *FA, SP, SU*
    - Prereq: Math 142 or 148
  - **EF 230 (2)** *FA, SP*
    - Prereq: EF 105 or CS 102
    - Coreq: EF 152/158 or Phy136/138
  - **ECON 201 or 207 (4)** *FA, SP, SU*
    - Coreq: Math 142 or 148

#### Spring
- **15 hours**
  - **Math 241 or 247 (4)** *FA, SP, SU*
    - Prereq: Math 142 or 148
  - **ME 231 (3)** *FA, SP, SU*
    - Prereq: Math 231 or 241 or 247
  - **Physics 232 (4)** *FA, SP, SU*
    - Prereq: Math 142 or 148
    - Coreq: Math 241 or 247
  - **Gen Ed (3)** *FA, SP, SU*
    - Art and Humanities

#### Fall
- **16 hours**
  - **NE 342 or 347 (3)** *FA, SP, SU*
    - Prereq: Math 231 or 241 or 247
  - **ECE 301 (3)** *FA, SP*
    - Prereq: Math 231
  - **NE 362 or 367 (3)** *FA, SP, SU*
    - Prereq: Math 231 or 241 or 247
  - **Physics 341 (3)** *FA, SP*
    - Prereq: Physics 232
  - **Gen Ed (3)** *FA, SP, SU*
    - Culture and Civilization

#### Spring
- **16 hours**
  - **NE 401 (4)** *SP*
    - Coreq: ECE 301 & Math 241/247
  - **NE 351 or 357 (3)** *SP*
    - Prereq: NE 200
  - **MSE 201 or 207 (3)** *FA, SP, SU*
    - Prereq: Math 142 or 148
  - **NE 470 (3)** *FA, SP*
    - Prereq: NE 360 or 367
    - Gen Ed (3) *FA, SP, SU*
    - Social Science

#### Fall
- **15 hours**
  - **NE 402 or 427 (WC) (4)** *FA, SP, SU*
    - Prereq: NE 401 and 470
  - **NE 360 (4)** *FA*
    - Prereq: NE 342
  - **ME 321 (3)** *FA, SP, SU*
    - Prereq: Math 202 with C or better and Math 142 or 148
  - **Technical Elective (3)** *FA, SP, SU*
    - Petition required in advance
  - **NE 471 (1)** *FA*
    - Prereq: NE 470

#### Spring
- **16 hours**
  - **NE 400 (OC) (1)** *SP*
    - Minimum student level: senior
  - **NE 406 or 467 (3)** *SP*
    - Prereq: NE 233 or 433 & Physic 232
  - **NE 472 (3)** *SP*
    - Prereq: NE 471
  - **Technical Elective (3)** *FA, SP, SU*
    - Petition required in advance
  - **Gen Ed (3)** *FA, SP, SU*
    - Art and Humanities

*Technical Electives* are selected from upper division mathematics, chemistry, physics and engineering courses and must be pre-approved by the department advisor. Courses in Nuclear Engineering other than 500, 502 and 598 may also be used as technical electives.

### Full Status Progression
A lower-division student may apply for progression to upper division after completing CHEM 120* or CHEM 128*, CHEM 130* or CHEM 138*, MATH 141* or MATH 147*, MATH 142* or MATH 148*, MATH 231, EF 151* or EF 157*, EF 152* or EF 158*, with a grade of C or better in each, and an overall GPA of at least 2.5.

### Provisional Status Progression
Students who have completed CHEM 120* or CHEM 128*, CHEM 130* or CHEM 138*, MATH 141* or MATH 147*, MATH 142* or MATH 148*, MATH 231, EF 151* or EF 157*, EF 152* or EF 158*, and PHYS 231* with a grade of C or better and have an overall GPA between 2.0 and 2.5 may apply for provisional status. The granting of provisional status is based on the availability of space in some 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 obtaining a minimum GPA of 2.5 in the first 9 hours of 300-level required nuclear engineering courses. Award of upper-division full status is dependent upon this performance. Students who have not progressed to upper-division will be dropped from departmental courses.

Students also have opportunities for an Honors Concentration and/or a five year BS/MS program. See the Undergraduate Catalog for details and requirements.

### Nuclear Graduation Requirements
Students are required to maintain a cumulative grade point average of at least 2.0 in all nuclear engineering courses taken at the University of Tennessee, Knoxville used to satisfy the graduation requirement. No more than four (4) credit hours of required nuclear engineering courses in which a C- or lower is the highest grade earned may be counted toward graduation. This is in addition to the university's graduation requirements.

Students are strongly recommended to meet with their faculty advisor every semester.

### UTRACK Milestones:

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<tr>
<th>Term</th>
<th>Courses</th>
</tr>
</thead>
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<td>2</td>
<td>Math 130 or higher</td>
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<td>3</td>
<td>EF 151/157 or Physics 135/137</td>
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<td>4</td>
<td>EF 152/158 or Physics 136/138</td>
</tr>
<tr>
<td>5</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
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## Nuclear Engineering Catalog 2017

### Radiological Concentration

#### Fall

<table>
<thead>
<tr>
<th>Hours</th>
<th>Course</th>
<th>Prerequisites</th>
<th>Corequisites</th>
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<tbody>
<tr>
<td>16</td>
<td>Math 141 or 147 (4) FA, SP</td>
<td>Math 130 or Math ACT 28 or Math SAT 630</td>
<td>EF 151 or 157 (4) FA, SP Coreq: EF 151 or 157</td>
</tr>
<tr>
<td>16</td>
<td>English 101 or 118 (3) FA, SP</td>
<td>Math 130</td>
<td>EF 151 or 157 (4) FA, SP Coreq: EF 151 or 157</td>
</tr>
<tr>
<td>16</td>
<td>Chem 120 or 128 (4) FA, SP, SU</td>
<td>Math 130</td>
<td>EF 151 or 157 (4) FA, SP Coreq: EF 151 or 157</td>
</tr>
<tr>
<td>16</td>
<td>EF 151 or 157 (4) FA, SP</td>
<td>Coreq: EF 151 or 157 and EF 105</td>
<td></td>
</tr>
</tbody>
</table>

**Prereq-** Math 130 or Math ACT 28
**Coreq-** EF 151 or 157 or Math SAT 630
**Prereq-** EF 151 or 157

#### Spring

<table>
<thead>
<tr>
<th>Hours</th>
<th>Course</th>
<th>Prerequisites</th>
<th>Corequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Math 142 or 148 (4) FA, SP</td>
<td>Math 141 or 147</td>
<td>EF 152 or 158 (4) FA, SP Coreq: EF 151 or 157</td>
</tr>
<tr>
<td>15</td>
<td>English 102 (3) FA, SP, SU</td>
<td>Math 141 or 147</td>
<td>EF 152 or 158 (4) FA, SP Coreq: EF 151 or 157</td>
</tr>
<tr>
<td>15</td>
<td>Chem 130 or 138 (4) FA, SP, SU</td>
<td>Math 120 or 128</td>
<td>EF 152 or 158 (4) FA, SP Coreq: EF 151 or 157</td>
</tr>
</tbody>
</table>

**Prereq-** Math 141 or 147
**Coreq-** EF 151 or 157

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**Fall**
- **Math 231 or 237 (3) FA, SP, SU**
- **NE 200 (2) FA**
- **Physics 231 (3) FA, SP, SU**
- **EF 230 (2) FA, SP**
- **ECON 201 or 207 (4) FA, SP, SU**

**Spring**
- **Math 241 or 247 (4) FA, SP, SU**
- **ME 233 (3) FA, SP, SU**
- **Physics 232 (4) FA, SP, SU**
- **Gen Ed (3) FA, SP, SU**

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**Fall**
- **NE 342 or 347 (3) FA**
- **ECE 301 (3) FA, SP**
- **Physics 341 (3) FA**
- **Gen Ed (3) FA, SP, SU**

**Spring**
- **NE 401 (4) SP**
- **Stats 251 (3) FA, SP**
- **Gen Ed (3) FA, SP, SU**

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**Fall**
- **NE 402 or 427 (WC) (4) FA**
- **NE 490 (3) FA**
- **Technical Elective *(3) FA, SP, SU**

**Spring**
- **NE 406 or 467 (3) SP**
- **NE 472 (3) SP**

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**Fall**
- **NE 400 (OC) (1) SP**
- **Minimum student level — senior**

**Spring**
- **NE 480 (1) SP**

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**Technical Electives** are selected from upper-division mathematics, chemistry, physics and engineering courses and must be pre-approved by the department. Courses in Nuclear Engineering other than 500, 502 or 598 may also be used as technical electives. Pre-med, pre-vet, and pre-dentistry students should take Chem 260, Chem 360 and 369.

### Full Status Progression

A lower-division student may apply for progression to upper division after completing CHEM 120* or CHEM 128*, CHEM 130* or CHEM 138*, MATH 141* or MATH 147*, MATH 142* or MATH 148*, MATH 231, EF 151* or EF 157*, EF 152* or EF 158*, and PHYS 231*, with a grade of C or better in each, and an overall GPA of at least 2.5.

### Provisional Status Progression

Students who have completed CHEM 120* or CHEM 128*, CHEM 130* or CHEM 138*, MATH 141* or MATH 147*, MATH 142* or MATH 148*, MATH 231, EF 151* or EF 157*, EF 152* or EF 158*, and PHYS 231* with a grade of C or better and have an overall GPA between 2.0 and 2.5 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 2.5 in the first 9 hours of 300-level required nuclear engineering courses. Award of upper-division full status is dependent upon this performance. Students who have not progressed to upper-division will be dropped from departmental courses.

### Nuclear Graduation Requirements

Students also have opportunities for an Honors Concentration and/or a five-year BS/MS program. See the Undergraduate Catalog for details and requirements.

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**UTRACK Milestones:**

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Term 4</th>
<th>Term 5</th>
<th>Term 6 through 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 130 or higher or one SS or one AH or one CC</td>
<td>Math 130 or higher</td>
<td>EF 151/157 or Physics 135/137</td>
<td>EF 152/158 or Physics 130/138</td>
<td>ME 202 or CS 102 or MSE 201 or CBE 201</td>
<td>No Milestones</td>
</tr>
</tbody>
</table>
Undergraduate Minors 2017-2018

College of Agricultural Sciences and Natural Resources
- Agricultural leadership
- Animal science
- Biosystems engineering technology
- Entomology and plant pathology
- Environmental and soil sciences
- Food and agricultural business
- Food science
- Forestry
- International agriculture and natural resources
- Natural resource and environmental economics
- Plant sciences
- Watershed
- Wildlife and fisheries science

College of Architecture and Design
- Architectural studies
- Design studies
- Industrial design
- Interior design

Haslam College of Business
- Business administration
- Entrepreneurship

College of Communication and Information
- Communication studies
- Information studies & technology
- Journalism & electronic media

College of Education, Health, and Human Sciences
- American Sign Language
- Art education
- Child and family studies
- Elementary education
- English as a second language education
- Leadership studies
- Mathematics education
- Nutrition
- Public health
- Restaurant and food service management
- Retail and consumer sciences
- Retail technology
- Science education
- Secondary education
- Tourism and hospitality management
- World language education

Tickle College of Engineering
- Aerospace engineering
- Biomedical engineering
- Computer science (not open to computer engineering)
- Concepts of cybersecurity (not for EECS majors)
- Cybersecurity (for EECS majors)
- Datacenter technology and management (for EECS, IE, and ME majors)
- Engineering entrepreneurship
- Environmental engineering
- Honors engineering leadership
- Materials science & engineering
- Mechanical engineering
- Nuclear decommissioning and environmental management
- Reliability & maintainability engineering

College of Arts and Sciences
- Africana studies
- American studies
- Anthropology
- Arab studies
- Art history
- Art studio
- Asian studies
- Astronomy
- Biological sciences
- Chemistry
- Chinese
- Cinema studies
- Classical archaeology
- Classical civilization
- Classics (Greek or Latin)
- Comparative literature
- Economics
- English
- English technical communication
- Environmental studies
- French and Francophone studies
- Geography
- Geology
- German
- Global studies
- History
- Italian
- Japanese
- Judaic studies
- Latin American and Caribbean studies
- Linguistics
- Mathematics
- Medieval and Renaissance studies
- Middle East studies
- Music (applied, composition, culture & theory)
- Music Business
- Neuroscience
- Philosophy
- Physics
- Physics — five-year BS/MS
- Political science
- Portuguese
- Psychology
- Religious studies
- Russian
- Russian literature in translation
- Spanish (Hispanic studies)
- Sociology (environmental issues and globalization)
- Statistics
- Sustainability
- Theatre
- VolsTeach math
- VolsTeach science
- Women, gender, and sexuality

Howard H. Baker Jr. Center for Public Policy
- Public policy analytics
All Pre-Health Advising takes place in the Arts & Sciences Advising Center, 313 Ayres Hall, 865-974-4481. Advisors are available in Arts and Sciences Advising Services to assist pre-medical students as they plan their programs. When a student declares a major, he/she should obtain an advisor in the department of the declared major, but should continue to consult with pre-medical advisors in Arts and Sciences Advising Services about the pre-medical program.

Students who are currently enrolled in another college, i.e., Engineering or Architecture, are required to take the following minimum courses for most medical schools:

- English 101-102 or Honors 118
- Biology 150-160 or Honors 158-168, and Lab 159
- Chemistry 120-130 or Honors 128-138
- Chemistry 260-360 or Honors 268-368, and Lab 369
- Physics 221-222 (231-232 for engineering students only)

The following courses are not required by medical schools, but their content is included on MCAT 2015

- Biology 240
- Biochemistry and Cellular and Molecular Biology 401
- Psychology 110, Sociology 120

Note that many of these courses have prerequisites and that the courses listed above constitute the minimal requirements for most medical schools. Pre-medical students are strongly urged to consult with a health professions advisor on a regular basis in 313 Ayres Hall. Students will want to verify with the medical schools of interest for specific requirements beyond what is listed here.

Selection Criteria at UT Health Science Center

1. Successful completion of the pre-medical requirements with grades of C or better earned in each course.
2. Letters of evaluation from three faculty members who have a good awareness of the student's ability.
3. Experience in/exposure to the health field.
4. Total academic performance, with attention given to course content and load, trends in performance, and general commitment to scholarship.
5. Satisfactory scores on the Medical College Admission Test (MCAT).
6. Personal interview with two members of the Committee on Admissions. (Competitively qualified applicants will be invited for interviews after their applications have been reviewed by the committee.)
7. Other criteria such as extracurricular activities; motivation and goals; research experience; the morals, character, and integrity of the individual; and any disciplinary or civil records that a person may have accrued.

Please note that high GPA and MCAT scores are not by themselves a sufficient basis for entrance into medical school. The Committee on Admissions takes a close look at the total experience of the applicant in making its final decisions. In addition, the Committee on Admissions reserves the right to require additional course work from any applicant. Correspondence course work must be approved prior to scheduling.

Pre-Professional File

During the junior year, pre-med students should attend a pre-professional file group meeting to learn about setting up the pre-professional file. Group meetings are scheduled weekly in Arts and Sciences Advising Services, 313 Ayres Hall. In the meeting, students are given information on pre-professional evaluations, AMCAS, and other aspects of the medical school application process. The most important aspect of the file is the letters of evaluation from faculty members who are familiar with the student's aptitude, ability, and personal characteristics. Two of the evaluations should come from faculty members teaching in science-based disciplines. Students should make every effort to become well acquainted with their professors prior to requesting the evaluations. Once the file has been started, students should maintain contact with the health professions assistant to periodically check on the file and to provide updated contact information. For the purposes of AMCAS, the file prepared in Arts & Sciences is considered a letter packet, and the primary contact for the packet is the chair of the health professions, Mary Anne Hoskins.

Alpha Epsilon Delta (AED)

Alpha Epsilon Delta is a pre-health honor society that seeks to provide information and opportunities for students with an interest in the health professions. The Tennessee Beta Chapter of AED is active at The University of Tennessee. AED activities include information sessions on preparing to apply to professional schools, local speakers from the medical community, trips to Tennessee medical schools and health centers, and service activities. The schedule of meetings is available at aedutkwix.com/aed-utk.

Requirements for membership include three terms of college (at least one at UTK), a cumulative GPA of 3.2, a science GPA of 3.2, and participation in AED sponsored events and meetings. Students interested in joining AED should apply for membership at the beginning of fall term. Applications are available in Arts and Sciences Advising Services, 313 Ayres Hall, and at the organizational Web site. Any pre-health student, regardless of membership, may participate in the programs sponsored by AED. Pre-health students wishing to receive notification of pre-health activities and AED events should send an e-mail to mhoskins@utk.edu to request to be added to the pre-health distribution list.

Distribution List

Pre-health students should contact Arts & Sciences Advising Services at asadvising@utk.edu at their earliest convenience to request to be added to the pre-health distribution list. Students on the distribution list are routinely updated about pre-health programming, announcements, and opportunities relevant to the health professions.
National Scholarships and Fellowships
The Office of National Scholarships and Fellowships exists to both inform and mentor students who wish to apply for nationally competitive scholarships and fellowships like the Truman, Rhodes, Marshall or Fulbright. We also assist outstanding undergraduates who wish to apply for Rotary Ambassadorial, Goldwater and Udall Scholarships.

The Office of National Scholarships and Fellowships will work with students to determine what fellowship would best fit their interests. Once students have decided to apply, we will assist them with the application process. To apply for most scholarships administered by our office, students need to begin the application process over a year before the scholarship period begins.

For more about each of the scholarships handled by the Office of National Scholarships and Fellowships, visit on 317 Greve Hall or call 865-974-3518 to schedule an appointment.

ORNL Summer Research and Internship
There exist numerous opportunities for undergraduates to supplement their academic learning with real world experience. The Chancellor’s Office and Oak Ridge National Laboratory (ORNL) each sponsor summer internship programs designed to promote research and creative activity among undergraduate students. The Department of Energy (DOE) also sponsors summer and semester length opportunities.

The role of the faculty mentor is paramount in these programs as they will provide guidance in the choice of a project and in the practice of professional approaches and methods. Projects proposed may be a student's undergraduate thesis, a part of the faculty mentor's research program, another research project or an ongoing project begun previously. The key is that the student be involved in actual scholarly work independent of a classroom setting.

For more information visit the website at www.ornl.gov

For more honors and research information, contact:

Kevin Kit
Engineering Honors Director
322 Perkins Hall
865-974-9810
kkit@utk.edu

Office of Undergraduate Research
Marisa Moazen
1534 White Ave.
865-974-8560
ugresearch.utk.edu

Cook Grand Challenge Honors Program
Admission
Admission as a first year student to the Cook Grand Challenge Honors Program and Honors Concentrations by invitation, which is extended by the engineering dean’s office to students meeting rigorous academic standards in their high school coursework.

Admission as a transfer student or after completing significant coursework at the University of Tennessee is by direct application to the departmental honors concentration in the student’s major department.

Requirements
Coursework
• Four 100- or 200-level honors courses (14 hours minimum, at least two courses must be from Engineering Fundamentals, Physics, Math, Chemistry, or Biology). Students may substitute upper-level courses on approval of honors faculty.
• Coursework requirements in the upper division are specific to the individual departments and the student is referred to those individual descriptions for explanation.

GPA
A minimum GPA to continue or graduate with a Departmental Honors Concentration may be required by the individual departments, see departmental description.

Breadth
An honors student is expected to broaden their undergraduate experience beyond a prescribed curriculum. Engineering Honors Concentration students must satisfy two of the five National Academy of Engineering (NAE) Grand Challenge Scholars Requirements (One of these must be at an Intermediate level and the other at an Introductory level. See next page for details.)

Additional Opportunities for Engineering Honors Students

NAE Grand Challenge Honors Programs
The Grand Challenge Engineer Program is for students who wish to concentrate in one of the NAE breadth areas and have an exposure to the others. It requires one Extensive experience and four Introductory Experiences in the five breadth areas. A qualified research experience must be related to one of the 14 NAE Grand Challenges.

The Grand Challenge Scholars Program is for students who wish to build a broad level of experience in all the NAE areas into their undergraduate program. It requires one extensive experience, two intermediate experiences, and two introductory experiences. A qualified research experience must be related to one of the 14 NAE Grand Challenges.
# Breadth Requirement Experience Levels for Honors Concentration, GCE, and GCS

<table>
<thead>
<tr>
<th></th>
<th>Extensive</th>
<th>Intermediate</th>
<th>Introductory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research</strong></td>
<td>Completion of a three-semester-long undergraduate research experience. Must result in a mentor-approved paper or poster which is presented at EUReCA, UT Honors Symposium, or other venue approved by the Honors director.</td>
<td>Completion of a two-semester-long undergraduate research experience. Must result in a mentor-approved paper or poster which is presented at EUReCA, UT Honors Symposium, or other venue approved by the Honors director.</td>
<td>Completion of a one-semester-long undergraduate research experience. Must result in a mentor-approved paper or poster which is presented at EUReCA, UT Honors Symposium, or other venue approved by the Honors director.</td>
</tr>
<tr>
<td><strong>Interdisciplinary coursework</strong></td>
<td>Minimum of 9 hours from approved list; see Honors website</td>
<td>Minimum of 6 hours from approved list; see Honors website</td>
<td>Minimum of 3 hours from approved list; see Honors website</td>
</tr>
<tr>
<td><strong>Entrepreneurship</strong></td>
<td>Minimum of 9 hours from the Minor in Entrepreneurship</td>
<td>Minimum of 6 hours from the Minor in Entrepreneurship</td>
<td>Minimum of 3 hours from the Minor in Entrepreneurship</td>
</tr>
<tr>
<td><strong>Global experience</strong></td>
<td>Full semester abroad (study program or internship) and a foreign language minor</td>
<td>6 hours coursework abroad or 3 hours coursework abroad and a foreign language minor</td>
<td>One course abroad or TCE non-credit global experience.</td>
</tr>
<tr>
<td><strong>Service learning</strong></td>
<td>An extensive experience in service learning would normally be designed by the student and approved by the Honors director to reflect individual student interests.</td>
<td>Minimum of 6 hours from TCE design course associated with the Smart Cities Initiative, other courses carrying UT service designation, or at least 6 months providing technical service for a non-profit organization.</td>
<td>Minimum of 3 hours from TCE design course associated with the Smart Cities Initiative, other courses carrying UT service designation, or at least 3 months providing technical service for a non-profit organization.</td>
</tr>
</tbody>
</table>

The departmental honors concentrations require one Intermediate experience and one Introductory experience.
### Advanced Placement

<table>
<thead>
<tr>
<th><strong>Subject</strong></th>
<th><strong>AP Score</strong></th>
<th><strong>Credit Given</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>American History</td>
<td>4 or 5</td>
<td>History 221-222</td>
</tr>
<tr>
<td>Biology</td>
<td>3</td>
<td>Biology 101</td>
</tr>
<tr>
<td>Biology</td>
<td>4</td>
<td>Biology 101-102</td>
</tr>
<tr>
<td>Biology</td>
<td>5</td>
<td>Biology 101-102 and 160</td>
</tr>
<tr>
<td>Calculus AB</td>
<td>3</td>
<td>Math 125</td>
</tr>
<tr>
<td>Calculus AB</td>
<td>4</td>
<td>Math 141</td>
</tr>
<tr>
<td>Calculus AB</td>
<td>5</td>
<td>Math 147</td>
</tr>
<tr>
<td>Calculus BC</td>
<td>3</td>
<td>Math 141</td>
</tr>
<tr>
<td>Calculus BC</td>
<td>4</td>
<td>Math 141-142</td>
</tr>
<tr>
<td>Calculus BC</td>
<td>5</td>
<td>Math 147-148</td>
</tr>
<tr>
<td>Chemistry</td>
<td>4 or 5</td>
<td>Chemistry 120-130</td>
</tr>
<tr>
<td>Chinese Language and Culture</td>
<td>4 or 5</td>
<td>Chinese 131-132</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>5</td>
<td>Computer Science 102</td>
</tr>
<tr>
<td>Economics - Microeconomics</td>
<td>3 or above</td>
<td>Economics 211</td>
</tr>
<tr>
<td>Economics - Macroeconomics</td>
<td>3 or above</td>
<td>Economics 213</td>
</tr>
<tr>
<td>English Language &amp; Composition</td>
<td>4 or 5</td>
<td>English 101</td>
</tr>
<tr>
<td>English Literature &amp; Composition</td>
<td>4 or 5</td>
<td><em>Students admitted fall 2016, credit for English 101</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Students admitted prior to fall 2016, credit for English 101-102</em></td>
</tr>
<tr>
<td>Environmental Science</td>
<td>3</td>
<td>Geology 201</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>4 or 5</td>
<td>Geology 201-202</td>
</tr>
<tr>
<td>European History</td>
<td>4 or 5</td>
<td>History LD-242 (Culture and Civilization)</td>
</tr>
<tr>
<td>French Language and Culture</td>
<td>3</td>
<td>French 211-212</td>
</tr>
<tr>
<td>French Language and Culture</td>
<td>4 or 5</td>
<td>French 212-333</td>
</tr>
<tr>
<td>German Language and Culture</td>
<td>4 or 5</td>
<td>German 211-212 or German 311-312</td>
</tr>
<tr>
<td>German Language and Culture</td>
<td>3</td>
<td>German 211-212</td>
</tr>
<tr>
<td>Government and Politics - Comparitive Exam</td>
<td>2014 exams and prior, 3,4, or 5; 2015 and later, 4 or 5</td>
<td>Political Science 102</td>
</tr>
<tr>
<td>Government and Politics - US Exam</td>
<td>2014 exams and prior, 3,4, or 5; 2015 and later, 4 or 5</td>
<td>Political Science 101</td>
</tr>
<tr>
<td>Human Geography</td>
<td>4 or 5</td>
<td>Geography 121</td>
</tr>
<tr>
<td>Latin Literature</td>
<td>3, 4, or 5</td>
<td>Latin 251-252</td>
</tr>
<tr>
<td>Music Theory - Aural Subscore</td>
<td>4</td>
<td>Music Theory 130</td>
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<td>Music Theory 130, 140</td>
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<td>Music Theory - Nonaural (written) Subscore</td>
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<td>Music Theory 110</td>
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<tr>
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<td>Music Theory 110, 120</td>
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<tr>
<td>Physics I</td>
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<td>Physics II</td>
<td>4 or 5</td>
<td>Physics 222</td>
</tr>
<tr>
<td>Physics C - E &amp; M</td>
<td>5</td>
<td>Physics 136</td>
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<tr>
<td>Physics C - E &amp; M</td>
<td>4</td>
<td>Physics 102 or 222 or 231</td>
</tr>
<tr>
<td>Physics C - Mechanics</td>
<td>5</td>
<td>Physics 135</td>
</tr>
<tr>
<td>Physics C - Mechanics</td>
<td>4</td>
<td>Physics 101 or 161 or 221</td>
</tr>
<tr>
<td>Psychology</td>
<td>3, 4, or 5</td>
<td>Psychology 110</td>
</tr>
<tr>
<td>Spanish Language or Literature</td>
<td>3</td>
<td>Spanish 211-212</td>
</tr>
<tr>
<td>Spanish Language or Literature</td>
<td>4</td>
<td>Spanish 212 and 300</td>
</tr>
<tr>
<td>Spanish Language or Literature</td>
<td>5</td>
<td>Spanish 300 and 305</td>
</tr>
<tr>
<td>Statistics</td>
<td>4 or 5</td>
<td>Statistics 201</td>
</tr>
<tr>
<td>World History</td>
<td>4 or 5</td>
<td>History 261-262</td>
</tr>
<tr>
<td>Subject</td>
<td>AP Score</td>
<td>Credit Given</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>----------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Biology (higher level)</td>
<td>5+</td>
<td>Biology 101-102</td>
</tr>
<tr>
<td>Chemistry (higher level)</td>
<td>5+</td>
<td>Chemistry 120-130</td>
</tr>
<tr>
<td>English (A1 exam)</td>
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<td>English 101</td>
</tr>
<tr>
<td>English (A1 exam)</td>
<td>6+</td>
<td>English 101-102</td>
</tr>
<tr>
<td>English (A2 and B exam)</td>
<td>N/A</td>
<td>No credit</td>
</tr>
<tr>
<td>Environmental Systems and Societies (standard level)</td>
<td>4+</td>
<td>Geology 202</td>
</tr>
<tr>
<td>Film (higher level)</td>
<td>5+</td>
<td>Cinema Studies LD</td>
</tr>
<tr>
<td>French (standard level)</td>
<td>5+</td>
<td>French 212</td>
</tr>
<tr>
<td>French (higher level)</td>
<td>5+</td>
<td>French 212, 333</td>
</tr>
<tr>
<td>Geography</td>
<td>4+</td>
<td>Geography 121</td>
</tr>
<tr>
<td>German (standard level)</td>
<td>4</td>
<td>German 211-212</td>
</tr>
<tr>
<td>German (higher level)</td>
<td>4+</td>
<td>German 211-212 or German 311-312 or German 321-322</td>
</tr>
<tr>
<td>History (higher level)</td>
<td>4+</td>
<td>History LD-LD</td>
</tr>
<tr>
<td>Latin (standard level)</td>
<td>5+</td>
<td>Latin 251-252</td>
</tr>
<tr>
<td>Latin (higher level)</td>
<td>4+</td>
<td>Latin 251-252</td>
</tr>
<tr>
<td>Math (higher level)</td>
<td>4+</td>
<td>Mathematics 141-142 plus 4 hours LD Math Credit</td>
</tr>
<tr>
<td>Music</td>
<td>6+</td>
<td>Musicology 110</td>
</tr>
<tr>
<td>Philosophy (higher level)</td>
<td>4+</td>
<td>Philosophy 101</td>
</tr>
<tr>
<td>Physics (higher level 1)</td>
<td>4+</td>
<td>Physics 221</td>
</tr>
<tr>
<td>Physics (higher level 2)</td>
<td>4+</td>
<td>Physics 222</td>
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<tr>
<td>Psychology (standard or higher level)</td>
<td>4+</td>
<td>Psychology 110</td>
</tr>
<tr>
<td>Social and Cultural Anthropology</td>
<td>4+</td>
<td>Anthropology 130</td>
</tr>
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<td>Spanish (higher level)</td>
<td>4+</td>
<td>Spanish 211-212</td>
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<tr>
<td>Theatre (higher level)</td>
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<td>Theatre 100 and Theatre LD</td>
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<tr>
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<td>5+</td>
<td>Art LD</td>
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<tr>
<td>World Religions (standard level)</td>
<td>4+</td>
<td>Religious Studies LD</td>
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Freshman Math Placement
Based on ACT Math or SAT Math Placement Scores

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<th>Math SAT taken after March 2016</th>
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<tr>
<td>25</td>
<td>570</td>
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<td>28</td>
<td>630</td>
<td>650</td>
<td>Math 141 Calculus 1</td>
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<tr>
<td>32</td>
<td>720</td>
<td>750</td>
<td>Math 147 Honors Calculus 1</td>
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</table>

Adjustments to Placement:
1. AP credits in Math or Dual Enrollment credits in Math trump the ACT Math/SAT Math placements.
2. Take the equivalent of Math 130 at a local community college or at UT in the summer prior to classes starting in the Fall.
3. Take an online placement test through the Math Department website (www.math.utk.edu). There will be two tests, one for attaining Math 130 (Level 3) and one for attaining Math 141 (Level 4). Engineering students take the test for Math 141. The test maybe repeated 3 times. Use the online remediation system to review, and then (re)take the placement test. The system is adaptive to the math elements needed for success.

Engineering Math courses
Students must be taking Math 141 or higher to be eligible for Engineering Fundamentals 151/157 or Physics 135/137.

Math 130 is preparation class:
These are required Math classes:

<table>
<thead>
<tr>
<th>Math 130 Pre Calculus 4 credit hours</th>
<th>Math 141/147 Cal I/Honors 4 credit hours</th>
<th>Math 142/148 Cal II/Honors 4 credit hours</th>
<th>Math 241/247 Cal III/Honors 4 credit hours</th>
<th>Math 231/237 Diff. Eq./Honors 3 credit hours</th>
<th>Math 251/257 Matrix/Honors 3 credit hours</th>
</tr>
</thead>
</table>

\[ mgh_0 + \frac{1}{2}mv_0^2 + \frac{1}{2}k\Delta x_0^2 + W_{gr} = mgh_f + \frac{1}{2}mv_f^2 + \frac{1}{2}k\Delta x_f^2 + E_{loss} \]
FOREIGN LANGUAGE – NOT REQUIRED IN ENGINEERING

Students can take a foreign language assessment as part of the Pre-Orientation steps. The College of Engineering does not require the study of foreign language to earn a diploma. However, intermediate (200 level) foreign language sequence satisfies the University’s General Education area of Cultures and Civilizations.

Students interested in earning intermediate foreign language credits in Spanish, French, German or others, contact:
Douglas W. Canfield
Modern Foreign Language Department
Room 7 Alumni Memorial Building
865-974-8193
lrc@utk.edu

Students interested in earning intermediate foreign language credits in Latin (Classics) contact:
Christopher Craig
Professor and Head
Department of Classics
1101 McClung Tower
865-974-2723
craigc@utk.edu

Placement Exam
All students planning to enroll in a French, German, Latin, or Spanish course who have completed at least two years of this language in high school and have not yet taken a college course in the language must take a UT placement exam before enrolling. This rule does not apply to students who receive AP credit in the language. The score on the exam will determine placement in the appropriate course. Ordinarily, a student will not be allowed to enroll in a course at a level above that determined by his/her placement exam score.

Transition Course
Some students who have had two years of the same language in high school and receive a placement score below the level required for admittance into intermediate-level language courses may be placed in a 150 language course. These courses are designed to prepare students for enrollment in intermediate-level foreign language courses and count as elective credit. Students who receive credit for this course may not receive credit for any other 100-level course of the same language.
General Education Requirements

http://catalog.utk.edu

Arts and Humanities (2 courses)
Taking two courses from the list below satisfies this requirement

Approved Arts and Humanities (AH) Courses

Africana Studies
• 160: Art of Africa, Oceania and Pre-Columbian America
• 225: Introduction to African Literature
• 226: Introduction to Caribbean Literature
• 233: Major Black Writers

Architecture
• 111: Architecture and the Built Environment
• 117: Honors-Architecture and the Built Environment
• 211: History and Theory of Architecture I
• 212: History and Theory of Architecture II
• 217: Honors-History and Theory of Architecture I
• 218: Honors-History and Theory of Architecture II

Art Design/Graphic
• 150: The Idea of Graphic Design

Art History
• 162: Art of Africa, Oceania and Pre-Columbian America
• 167: Honors-Art of Africa, Oceania and Pre-Columbian America
• 172: Western Art I
• 173: Western Art II
• 177: Honors-Western Art I
• 178: Honors-Western Art II
• 183: Asian Art
• 187: Honors-Asian Art

Cinema Studies
• 281: Introduction to Film Studies

Classics
• 221: Early Greek Mythology
• 222: Classical Greek and Roman Mythology
• 232: Archeology and Art of Ancient Greece and Rome
• 253: Greek and Roman Literature in English Translation
• 254: Greek and Roman Epic in English Translation
• 255: Greek and Roman Drama in English Translation

English
• 201: British Literature I-Beowulf through Johnson
• 202: British Literature II-Wordsworth to Present
• 206: Introduction to Shakespeare
• 207: Honors-British Literature I
• 208: Honors-British Literature II
• 221: World Literature I-Ancient through Early Modern
• 222: World Literature II-18th Century to Present
• 225: Introduction to African Literature

• 226: Introduction to Caribbean Literature
• 231: American Literature I-Colonial Era through the Civil War
• 232: American Literature II-Civil War to Present
• 233: Major Black Writers
• 237: Honors-American Literature I-Colonial Era through the Civil War
• 238: Honors-American Literature II-Civil War to Present
• 247: Honors: Introduction to Poetry
• 248: Honors: Introduction to Drama
• 251: Introduction to Poetry
• 252: Introduction to Drama
• 253: Introduction to Fiction
• 254: Themes in Literature
• 258: Honors: Introduction to Fiction
• 281: Introduction to Film Studies

Haslam Scholars Program
• 258: Foundations of Modernity
• 287: Knowledge

Musicology
• 110: Introduction to Music in Western Culture
• 115: Music in the United States
• 120: History of Rock
• 125: Jazz in American Culture
• 210: History of Western Music-Ancient to the Baroque
• 220: History of Western Music-Classical to the Present
• 290: Soundscape-Exploring Music in a Changing World

Philosophy
• 101: Introduction to Philosophy
• 107: Honors-Introduction to Philosophy
• 200: Special Topics
• 244: Professional Responsibility
• 252: Contemporary Moral Problems

Religious Studies
• 225: Introduction to Judaism, Christianity, Islam
• 280: Introduction to the Religions of Asia

Russian
• 221: Rebels, Dreamers and Fools-The Outcast in 19th Century Russian Literature
• 222: Heaven or Hell-Utopias and Dystopias in 20th Century Russian Literature

Theatre
• 100: Introduction to Theatre
• 107: Honors: Introduction to Theatre

University Honors
• 257: Special Topics in the Arts and Humanities
• 258: Special Topics in the Arts and Humanities

Social Sciences (2 courses)
This requirement is satisfied by taking two courses from the following list.

Approved Social Sciences (SS) Courses

Africana Studies
• 201: Introduction to African-American Studies
• 202: Introduction to African-American Studies

Agricultural and Resource Economics
• 201: Economics of the Global Food and Fiber System

Agriculture and Natural Resources
• 180: Global Dynamics: Food, Biodiversity and the Environment

Anthropology
• 130: Cultural Anthropology
• 137: Honors-Cultural Anthropology

Baker Center for Public Policy
• 101: Introduction to Public Policy

Child and Family Studies
• 210: Human Development
• 220: Marriage & Family—Roles & Relationships

Economics
• 201: Intro to Economics-A Survey Course
• 207: Honors-Introductory Economics

Educational Psychology
• 210: Psychoeducational Issues in Human Development

Geography
• 101: World Geography
• 111: Geography of the Digital World

Haslam Scholars Program
• 257: Power
• 268: Perspectives on Globalization

Interior Architecture
• 200: Human Environment Relations

Political Science
• 101: US Government and Politics
• 102: Introduction to Political Science

Psychology
• 110: General Psychology
• 117: Honors-General Psychology

Religious Studies
• 232: Religions in Global Perspective
• 233: Religion and Society in North America

Social Work
• 250: Social Welfare

Sociology
• 110: Social Justice and Social Change
• 120: General Sociology

University Honors
• 267: Special Topics in the Social Sciences

Women’s Studies
• 230: Marriage and Family-Roles and Relationships
General Education Requirements

Cultures and Civilizations (2 courses)
This requirement is satisfied by either
(1) taking two courses from the following list or
(2) taking a two-course sequence in a foreign language at the intermediate level or
(3) taking a six-hour intensive foreign language course at the intermediate level.

Approved Cultures and Civilizations (CC) Courses

Africana Studies
• 235: Introduction to African Studies
• 236: Introduction to African Studies

Anthropology
• 120: Prehistoric Archaeology
• 127: Honors-Prehistoric Archaeology

Classics
• 201: Introduction to Classical Civilization

Cultural Studies in Education
• 200: Survey of International Education

Environmental and Soil Sciences
• 120: Soils and Civilizations
• 220: Waters and Civilizations
• 227: Honors–Waters and Civilizations

Food Science and Technology
• 150: History and Culture of Food

Global Studies
• 250: Introduction to Global Studies

History
• 241: Development of Western Civilization
• 242: Development of Western Civilization
• 247: Honors-Development of Western Civilization
• 248: Honors-Development of Western Civilization
• 255: Introduction to Latin America and Caribbean Studies
• 256: Introduction to Latin America and Caribbean Studies
• 261: History of World Civilization
• 262: History of World Civilization
• 267: Honors-History of World Civilization
• 268: Honors-History of World Civilization

Haslam Scholars Program
• 368: Study Abroad: Edinburgh, Scotland

Latin America and Caribbean Studies
• 251: Early Latin American and Caribbean History
• 252: Modern Latin American and Caribbean History

Medieval Studies
• 201: Medieval Civilization I
• 202: Medieval Civilization II

Modern Foreign Languages and Literatures
• 200: Topics in International Literatures and Cultures

Plant Sciences
• 115: Plants That Changed the World
• 491: International Study: History and Culture of International Gardens and Landscapes

Religious Studies
• 101: World Religions in History
• 102: The Comparison of World Religions

Sociology
• 250: Introduction to Global Studies

University Honors
• 277: Special Topics in Cultures and Civilizations
• 278: Special Topics in Cultures and Civilizations

Intermediate Foreign Language Courses (6 credit hours)

French
• French 223

German
• German 223

Italian
• Italian 223

Portuguese
• Portuguese 223

Spanish
• Spanish 223

For a complete listing of all approved courses, please reference the extensive list online in the Undergraduate Catalog, catalog.utk.edu.
General Education Requirements in Engineering

**College of Engineering General Education Requirements**

**Major**

**Communicating Through Writing**
1. English 101 or 198 or 118 or 131
2. English 102 or 298 or 132 or completion of Honors sequence
3. See major requirements

**Natural Sciences**
1. EF 151 or 157 (Honors) (Physics 135/137 for Computer Science ONLY)
2. EF 152 or 158 (Honors) (Physics 136/138 for Computer Science ONLY)

**Social Sciences**
1. Economics 201 or 207 (Honors) required for all majors EXCEPT Chemical, Electrical, Computer, Computer Science
2. ____________
   Pick one from Catalog Social Sciences list

**Communicating Orally**
1. See major requirements

**Quantitative Reasoning**
1. Math 141 or 147 (Honors)
2. Math 142 or 148 (Honors)

**Arts and Humanities**
1. ____________
2. ____________
   Pick two from Catalog Arts and Humanities list

**Cultures and Civilizations**
1. ____________
2. ____________
   Pick two from Catalog Cultures and Civilizations list
General Education Requirements by Major

See catalog.utk.edu for the University of Tennessee General Education Requirements

Communication Through Writing:
- Aerospace - AE 449
- Biomedical - BME 430
- Biosystems - English 360
- Chemical - CBE 415
- Civil - CE 205
- Computer, Electrical - ECE 402
- Computer Science - CS 402
- Industrial - IE 350, 422
- Materials Science - MSE 304, 405
- Mechanical - ME 449
- Nuclear - NE 401, 402, 427

Cultures and Civilizations:
Students may satisfy Cultures and Civilizations in one of two ways: intermediate proficiency in a foreign language, demonstrated by credit for the 200-level sequence in the foreign language, OR two completed courses from the Cultures and Civilizations list from the catalog. The Tickle College of Engineering does NOT require foreign language, but students are welcome to use intermediate proficiency in foreign language to satisfy this requirement.

Communicating Orally:
- Aerospace, Biomedical, Mechanical - AE 410, BME 410 or ME 410
- Biosystems - BSE 404
- Chemical - CBE 488 or 490
- Civil - CE 205
- Computer, Electrical - ECE 402
- Computer Science - CS 402
- Industrial - IE 422
- Materials Science - MSE 489
- Nuclear - NE 400

\[ f' = f_0 \frac{v + v_L}{v + v_S} \]
Universal Tracking (UTracK)

Universal Tracking (UTracK) is an academic monitoring system designed to help students stay on track for timely graduation. Tracking will begin with first-time, first-year, full-time, degree-seeking college students entering fall 2013.

Policy
1. Students must declare a major or exploratory track at the time they are admitted to the university. Some majors have a competitive admissions process.
2. All students must transition out of exploratory tracks into a major track no later than the end of the fourth tracking semester at UT.
3. Students who are off track must develop an advisor-approved plan for getting back on track before they will be allowed to register for future tracking semesters.
4. Students who are off track for two consecutive semesters will be placed on hold and required to select a new major that is better aligned with their abilities.

Definitions
Exploratory Tracks
- College-Level Exploratory—Students who are deciding among one or more majors that are all offered by the same college follow an exploratory track for that college (e.g., Arts and Sciences Exploratory, Business Exploratory, etc.)
- University Exploratory—Students who have no clear idea of which major to pursue and/or those who are trying to decide among majors that are not in a single college follow the University Exploratory track.

Milestones—In order to remain on track for a major or exploratory area, students must complete minimum requirements for each tracking semester known as milestones. Milestones include successful completion of specified courses and/or attainment of a minimum GPA.

Tracking Semesters—Only fall and spring semesters are tracking semesters. Mini and summer semesters are not tracking semesters, they provide an opportunity for students to catch up on unmet milestones. Study abroad and co-op semesters are not tracking semesters. Students participating in study abroad and co-op are not required to complete milestones while they are away from campus.

Tracking Audit—Tracking audits will help students identify their milestone progress; audits are tied to a catalog year. Tracking audits will be used to notify students when they are off track.

Off Track for a Single Semester—Students who are off track at the end of a tracking semester must meet with an advisor as soon as possible but no later than the end of the next tracking semester to develop a plan for getting back on track. Students who do not have an advisor-approved plan for getting back on track will not be allowed to register for future tracking semesters.

Off Track for Two Consecutive Semesters—Students who are off track for two consecutive semesters will have a hold placed on their registration and must meet with a new advisor in one of the advising centers no later than the end of the “add” period of the next tracking term to select a new major that is better aligned with the student’s abilities.
Registration Quick Guide

Log on to MyUTK (myutk.utk.edu)
Username: NetID (no spaces)
Password: NetID Password

1. Find the “UTK Student Registration Links” web part.
   • Select the desired term.
   • Select the “Add/Drop Classes” link.

2. Advising — if advising has not been cleared, you will receive a message to contact your advisor before you can register.

3. Holds — if you are unable to register due to a hold, click View Holds from the Student menu.

4. To Add — use the worksheet to enter course reference numbers (CRN). If you are adding a course that has a co-requisite, you MUST enter both course CRNs in the worksheet.

5. To search for CRNs, click the Class Search button.

6. To drop — click the Action box beside the course.

7. Multiple Subject Search - You can search on multiple Subjects by holding the Shift key down and clicking more than one Subject. To select all Subjects, hold Shift + Ctrl, scroll to the bottom of the subject list and click the last subject. This feature is useful for searching all courses with a particular attribute, such as GenEd-Arts/Humanities.

8. To register for classes —
   • click the box in front of the course to select your course (C=closed)
   • click “Register” or “Add to Worksheet”

9. Error message examples:
   • student level restriction requires permission of department or instructor
   • pre-requisite, co-requisite or test score mandatory to take this course

10. Waitlists — Departments can choose to have a Priority or a First-In/First-Out Waitlist.
    • Students are not automatically enrolled from the Waitlist.
    • You will be notified by e-mail that a seat is available and will have 24 hours to add the course.
    • You will need to get required permissions prior to adding during the 24-hour period.

For more information, please visit the One Stop Shop.
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<th>Time</th>
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<td>5:05-6:20</td>
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</table>
Fall Semester 2017

Classes Begin .................................................. Wednesday, August 23
Labor Day ........................................................ Monday, September 4
Fall Break .......................................................... Thursday–Friday, October 5–6
1st Session Ends .................................................. Friday, October 13
2nd Session Begins .............................................. Monday, October 16
Thanksgiving ..................................................... Thursday–Friday, November 23–24
Classes End ........................................................ Tuesday, December 5
Study Day .......................................................... Wednesday, December 6
Exams ............................................................... Thursday–Thursday, December 7, 8, 11, 12, 13, 14
Graduate Hooding .............................................. Thursday, December 14
Commencement .................................................. Friday, December 15
Official Graduation Date .................................... Saturday, December 16

Spring Semester 2018

Classes Begin .................................................. Wednesday, January 10
MLK Holiday .................................................... Monday, January 15
1st Session Ends .................................................. Wednesday, February 28
2nd Session Begins .............................................. Thursday, March 1
Spring Break ..................................................... Monday–Friday, March 12–16
Spring Recess ..................................................... Friday, March 30
Classes End ....................................................... Friday, April 27
Study Day .......................................................... Monday, April 30
Exams ............................................................... Tuesday–Tuesday, May 1, 2, 3, 4, 7, 8
Graduate Hooding .............................................. Thursday, May 10
College Commencement Ceremonies ................. Thursday–Saturday, May 10–12
Official Graduation Date .................................... Saturday, May 12

Summer Term 2018

Mini Session Begins .............................................. Wednesday, May 9
Memorial Day Holiday ........................................ Monday, May 28
Mini Session Ends .............................................. Wednesday, May 30
Full and 1st Sessions Begin ................................ Thursday, May 31
Independence Day Holiday ................................ Wednesday, July 4
1st Session Ends .................................................. Friday, July 6
2nd Session Begins .............................................. Monday, July 9
Full and 2nd Sessions End ..................................... Friday, August 10
Summer Graduation Date* .................................. Saturday, August 11

*There is no commencement ceremony in the summer. This date is the official graduation date that will appear on the transcript of graduating students. The Academic Calendar is available on the Web site of the Office of the University Registrar: registrar.tennessee.edu/academic_calendar.
Key Term Dates

Fall 2017 - Undergraduate
Priorit Registration Begins ............................................................. March 20, 2017
Fall 2017 Graduation Application Deadline and Admission to Candidacy Deadline for Graduate Students August 11, 2017
Classes Begin ........................................................................... August 23, 2017
Last Day to Add, Change Grading Options or Drop without a “W” — 1st Session Courses .... August 28, 2017
Last Day to Final Register, Add, Change Grading Options or Drop without a “W” - Full Session Courses . September 1, 2017
Labor Day (No Classes) ............................................................... September 4, 2017
Last Day to Adjust Hours for Financial Aid Awarding .................. September 5, 2017
Last Day to Drop with a “W” - 1st Session Courses ......................... September 29, 2017
Fall Break (No Classes) ............................................................... October 5–6, 2017
First Session Classes End ............................................................. October 13, 2017
Second Session Classes Begin ..................................................... October 16, 2017
Last Day to Add, Change Grading Options or Drop without “W” - 2nd Session Courses ...... October 21, 2017
Last Day to Drop with a “W” - Full Term Courses ......................... November 14, 2017
Last Day to Drop with “W” - 2nd Session Courses ......................... November 22, 2017
Thanksgiving Holidays (No Classes) .......................................... November 23–24, 2017
Total Withdrawal from the University Deadline .......................... December 5, 2017
Classes End (Full and Second Session) ....................................... December 5, 2017
Study Day ................................................................................ December 6, 2017
Exam Period ............................................................................. December 7, 8, 11, 12, 13, 14 2017
Commencement (Thompson Boling Assembly Center & Arena) December 15, 2017
Official Graduation Date on Transcript ....................................... December 16, 2017

Financial Calendar for Fall Term 2017
Statement information available on MYUTK.UTK.EDU. .................. August 14, 2017
Priority Registration Payment/Deadline ........................................ August 21, 2017 by 4:30 p.m.
Late Registration/Late Fees Begin ............................................. August 23, 2017
Late Registration Payment/Deadline ........................................... September 1, 2017 by 4:30 p.m.

* PAYMENT MUST BE RECEIVED BY THESE DEADLINES WHETHER OR NOT YOU HAVE RECEIVED a VolXpress STATEMENT. You may view your account on MyUTK.
## Key for Engineering Buildings

<table>
<thead>
<tr>
<th>Building</th>
<th>Room</th>
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<tbody>
<tr>
<td><strong>Dougherty Hall</strong></td>
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<tr>
<td>Department of Chemical &amp; Biomolecular Engineering</td>
<td>419</td>
</tr>
<tr>
<td>Department Mechanical, Aerospace, and Biomedical Engineering</td>
<td>414</td>
</tr>
<tr>
<td>National Office, Tau Beta Pi Engineering Honor Society</td>
<td>508</td>
</tr>
<tr>
<td><strong>Claxton</strong></td>
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<tr>
<td>Innovative Computing Laboratory</td>
<td>203</td>
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<tr>
<td><strong>East Stadium Hall</strong></td>
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<tr>
<td>Center for Materials Processing</td>
<td>513</td>
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<tr>
<td>Reliability &amp; Maintainability Center</td>
<td>507</td>
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<tr>
<td><strong>Min H. Kao Electrical Engineering &amp; Computer Science Building</strong></td>
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<tr>
<td>Department of Electrical Engineering &amp; Computer Science</td>
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<tr>
<td>CURENT</td>
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<tr>
<td><strong>Pasqua Hall</strong> <em>(moving to Earth and Planetary Sciences Building June 2017)</em></td>
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<tr>
<td>Department of Nuclear Engineering</td>
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<tr>
<td><strong>Perkins Hall</strong></td>
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<td>College of Engineering Administrative Offices</td>
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<td>Communications</td>
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<td>Engineering Advising Office</td>
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<td><strong>Science &amp; Engineering Research Facility (SERF)</strong></td>
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<tr>
<td><strong>John D. Tickle Engineering Building</strong></td>
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<tr>
<td>Department of Civil &amp; Environmental Engineering</td>
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<td>Department of Industrial &amp; Systems Engineering</td>
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<td><strong>UT Conference Center</strong></td>
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<td>Center for Transportation Research</td>
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<td><strong>Cherokee Farm Innovation Campus</strong></td>
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<td>Joint Institute for Advanced Materials (JIAM)</td>
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<td><strong>Not Shown</strong></td>
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<tr>
<td>Biosystems Engineering &amp; Soil Science — 2506 E.J. Chapman Drive, Knoxville, TN</td>
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<tr>
<td>National Transportation Research Center — 2360 Cherohala Blvd., Knoxville, TN</td>
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<tr>
<td>UT Space Institute — 411 B.H. Goethert Parkway, Tullahoma, TN</td>
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ENGINEERING ADVISING

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Phone: 865-974-4008
Email: engradvising@utk.edu