The college has ten major undergraduate curricula in which a student may specialize: aerospace engineering, chemical engineering, civil engineering, electrical engineering, engineering science, industrial engineering, materials science and engineering, mechanical engineering, nuclear engineering, and engineering physics.

BIOSYSTEMS ENGINEERING

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

FACILITIES

Most of the college's facilities are on the southeastern corner of The Hill. Administration, Civil and Environmental Engineering, and Engineering Science are in Perkins Hall. Electrical Engineering is in Frens Hall; Industrial Engineering is in the Alumni Memorial Building. Nuclear Engineering is in the Hansen Engineering Building. Mechanical and Aerospace, Chemical, and Materials Science are in Dougherty Hall; and the Freshman Engineering Advising Center, the Co-op Office, and the Minority Engineering Scholarship Program Office are in Perkins Hall. The Engineering Physics program is administered through the UT-Knoxville Physics Department in the Nielsen Physics Building.

TAU BETA PI NATIONAL HEADQUARTERS

The college is honored to have the national headquarters of Tau Beta Pi, the National Engineering Honor Society, housed on our campus. This honor was earned in part through the uniting efforts of R.C. "Red" Matthews, who served as secretary-treasurer for the organization from 1936 to 1947. The suite of offices, located in Dougherty Hall, is occupied by Mr. J.D. Froula, secretary-treasurer, Roger Hawks, Assistant Secretary-Treasurer, and his staff.

COOPERATIVE ENGINEERING PROGRAM

The five-year Cooperative Engineering Program (Co-op) is offered in order to provide an augmented engineering education that includes significant experience in industry as well as superior academic preparation. Our Cooperative Engineering Program was established in 1926. The University of Tennessee was one of the early pioneers in this valuable type of education. Co-op work assignments differ from part-time or summer employment in that they involve regularly scheduled cycles of full-time academic terms alternating with full-time work periods, resulting in planned, career-related work terms of progressive complexity and responsibility. In introducing the student to engineering employment, the college and industry join together to offer a broader and richer preparation for post-graduate employment than can be provided by a conventional academic program. This experience in an industrial and professional environment contributes to the student's maturity, accelerates professionalism, offers an opportunity to apply engineering course work in a real-world setting, and enables the student to define more clearly educational and career interests and objectives. All positions are paid, and most students are able to offset a substantial amount of their college expenses with Co-op earnings. Some of the experiences is at a subprofessional level, yet is of great significance in achieving a complete education. Participation in the Cooperative Engineering Program usually begins with application during the freshman year and placement with a co-op employer during the sophomore year, after the student has completed at least 18 hours of academic work. The five-year Co-op program usually begins with application during the freshman year and placement with a co-op employer during the sophomore year, after the student has completed at least 18 hours of academic work.

Candidates must be able to project a minimum of 32 weeks of Co-op experience prior to the senior year, within the regular alternating sequence. It usually takes three to four semesters to complete a conventional engineering curriculum, but the college and industry jointly undertake to introduce the student to engineering employment, resulting in planned, career-related work terms of progressive complexity and responsibility.

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INTERNATIONAL ENGINEERING PROGRAM

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

GRADUATE PROGRAM

Graduate programs leading to the degree of Master of Science are offered in all areas of study, and the degree of Doctor of Philosophy is offered in nine major subject areas: aerospace engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, nuclear engineering, nuclear engineering, and polymer engineering. Information concerning graduate programs is given in the Graduate Catalog.

CURRICULA IN ENGINEERING

NATIONAL ACCREDITATION

Since 1936, engineering programs at institutions of higher learning have been accredited by an organization formed by many engineering societies and known as the Accreditation Board for Engineering and Technology (ABET). Currently accredited engineering programs at UT Knoxville include aerospace, biosystems, chemical, civil, electrical, mechanical engineering science, industrial, materials science, and nuclear. Co-op programs in the above areas are also ABET accredited.

DESIGNATION OF A MINOR

An engineering undergraduate may declare a minor in a non-engineering subject area and have the minor noted on the permanent record under the following conditions:

1. Minor must be officially approved and described in the UT Knoxville catalog. No unofficial minors will be recognized. Minors exist in Aerospace Engineering, Environmental Engineering, Materials Science and Engineering, Meteorology, Music, and in numerous departments in Agriculture and Forest Resources.

2. Courses taken to satisfy the minor may also be used to satisfy the requirements of a major, provided that the courses would be a part of engineering degree requirements even if no minor was assigned. Completion of a minor often involves the taking of some courses which cannot be used to satisfy the minimum degree requirement for an engineering degree.

3. A student should notify his or her advisor and major department office when beginning work on a minor. The intention to complete a minor must be declared at the time of application for a degree if the minor is to appear on the final transcript. Degree applications are handled by the UT Knoxville Records Office.

ADVISING

New freshman students are assigned to the Freshman Engineering Advising Center (FEAC) for academic advising and career counseling until they have completed their freshman curriculum. Freshman students admitted to the College of Engineering are not required to designate their field of study until the end of the freshman year. At that time, students select the program of their choice. As soon as possible, students are assigned a faculty advisor in their selected department.

COURSE LOAD

The maximum number of hours which can be taken by an undergraduate engineering student without special permission is 19. The Associate Dean for Academic Affairs must give permission to take 20 hours or more. In general, this decision is based on the student's previous performance at UT Knoxville.

LATE DROP REQUESTS

Late drop requests, which may be approved for reasons other than academic difficulties, are handled by the Office of Academic Affairs. For other procedures refer to "Changes in Registrations" in the general section of this catalog.

GENERAL REQUIREMENTS

Students are advised to consult the UT Knoxville's degree requirements as stated in the front section of this catalog as well as departmental requirements.

Transfer Students: Transfer students, including internal UTK transfers, must meet the minimum requirements stated below in order to be considered for admission to a major within the College.

1. You must have a minimum of 2.30 cumulative average over those specific courses, or their equivalents, English 101, 102, Chemisty 120, 130; and Math 141, 142.

2. The overall record will be evaluated for quality and seriousness of purpose. An excessive number of withdrawals, incompletes, repeated courses, or failure may result in denial.

3. Any UT Knoxville student desiring association with one of the departments of the College of Engineering should go to the departmental office; (1) an interview in the department head or his designee is held, with the formal form of consideration being the same as for external transfer students. If association is granted, a College/Major/Advisor Change Form is processed by the department to officially change the student's academic home.

Transfer Credits: Every attempt will be made to give maximum credit for courses taken elsewhere. Discussions concerning the evaluation of transfer credits should be made with the department head of the department (or designee) into which the student is being transferred. But not until after receiving the evaluation of transfer credits by the Admissions Office.

Program for Second B.S. Degree.

Upon approval by the Dean of Engineering and the Committee on Degrees of a program of study recommended by the appropriate engineering department, a student who already holds a bachelor's degree may obtain a degree in engineering upon meeting all of the course requirements. In no case will the minimum requirements be less than 30 semester credits. The prevailing ABET accreditation requirements must be met.

Satisfactory/No Credit Courses. Engineering majors may take half of their minimum hours required (6) of humanities-social science courses and (6) of technical courses on a Satisfactory/No Credit (S/NC) grading basis. No other courses specified as part of the minimum degree requirements may utilize S/NC grading; unless a course is offered only on that grading basis. Students are encouraged to take courses in areas which are not part of the minimum degree requirements, but which may be part of the S/NC grading option for such coursework.

Correspondence Courses. A student should check with his or her major department to see what restrictions there are, if any, on the use of correspondence course credit to meet the minimum degree requirements.

Humanities and Social Science Electives. Engineering practice is shaped by many nonten-technical considerations. Economic, safety, and ethical matters have long been of concern. In recent years increasing influence has been exerted by legal, political, governmental, economic, and international factors. Studies in the humanities and social sciences serve to meet the vital need for awareness and knowledge of these influences on the engineering profession. Students are encouraged to minor in sciences, humanities, and social science courses, or pursue a major in the College of Arts and Sciences to acquire a broad cultural background in and to society. Subject areas in the humanities and social sciences include sociology, psychology, economics, anthropology, and political science.

Acceptability is determined by course content, not by title or administrative home.

Courses not included under this category include (1) a language course in a student's major language; (2) performance or skill development courses, including those in writing or oral communication; (3) military science courses unless officially equivalent to a course in the humanities or social sciences in another department; (4) courses whose basic content is in science or mathematics; (5) engineering, economics, and (6) professional courses in other fields - business, communications, etc. Large course units generally must include some cultural aspects, and not be limited exclusively to lecture-type courses. A course not on the approved list must be approved by the student's faculty advisor in their selected department. An exception to this policy applies to departmental substitution form and submitted to the College Office. Transfer courses must be approved, unless a suitable UTK equiva- lent course number has been assigned as part of the admissions process.
The courses selected to meet the minimum hour requirement in this category must provide both breadth and depth of coverage, and must not be limited to a selection of unrelated introductory courses. A student is urged to seek guidance from his or her advisor if necessary in choosing these electives, since this is an important part of the learning experience in preparation for professional practice. Courses should be made on the basis of personal interest and likely value in angling practice. Up to 9 hours in this category can be taken on an S/NC grading basis.

These requirements are not intended to inhibit in any way the selection of courses to be taken by a student while attending UTK. There are non-technical courses which are a required part of the engineering degree requirements which do not fall in this category, such as courses designed to develop written and oral communication. There may be courses of interest to a student which do not meet these HSS requirements, but which should be a part of the student's educational experience at UTK.

The requirements for the humanities/social science elective portion of all engineering curricula are as follows:

1. The minimum number of semester credit hours of acceptable courses is 18.
2. No more than two freshman-level courses (100 number) may be taken.
3. The second semester of a freshman-level foreign language course does not count in this total.
4. To ensure depth of coverage, a student must take courses in at least two different languages or foreign literatures are considered to be a single subject.
5. For this purpose, all foreign languages are considered to be a single subject.

Approved Humanities/Social Sciences Electives:

- American History Requirement. Engineering students may take one of these courses (described elsewhere in this catalog). Those students who have not had the required year of American history in high school may choose the required six semester hours from History 221 and 222, or other courses deemed suitable by the Department of History. These hours may be counted as part of the required blocks of humanities and social science electives.

Technical Electives: Technical electives are to be selected with the advice and approval of the student's major department. In some of the curriculum tabulations a choice of such electives is indicated, and regulations in regard of the student's major department. In some of the curriculums a choice of such electives is indicated, and regulations in regard of the student's major department. In some of the curriculums a choice of such electives is indicated, and regulations in regard of the student's major department.
BACHELOR OF SCIENCE PROGRAM

Chemical engineering is a discipline dedicated to the development, design, operation and management of plants and processes for economical conversion of chemical raw materials to useful products. It is a broadly based discipline, with heavy emphasis on chemistry, mathematics, and also including physics, materials and the humanities. Graduates of the program are qualified to work in fields such as fixed and pharmaceutical processing, biomedical engineering, fuels production and as food and pharmaceutical processing, biotechnology, with heavy emphasis on chemistry and utilization of useful products. It is a broad-based discipline for economical conversion of chemical raw materials and management of plants and processes for engineering applications. There are several disciplines required to demonstrate their abilities to perform satisfactorily in upper-division courses by attaining a minimum GPA of 2.0 in at least 9 hours of 200 and 300 level required courses specified by the department. Further progress to upper-division courses is dependent upon the minimum level of performance.

Any student with an overall GPA below 2.5 will not be admitted to upper-division Chemical Engineering courses. Students who have not been admitted to Upper-division Status will be dropped from departmental class rolls. Transfer students to the upper-division level are admitted on a Provisional Status basis only. 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 abilities to perform satisfactorily in upper-division courses by attaining a minimum GPA of 2.0 in at least 9 hours of 200 and 300 level required courses specified by the department. Further progression to upper-division courses is dependent upon the minimum level of performance.

Graduate programs leading to the degrees of Master of Science and Doctor of Philosophy in Chemical Engineering are offered. The University's Graduate School operates a Resident Graduate Program at Oak Ridge and Kingsport.
BACHELOR OF SCIENCE PROGRAM

The course of study for the degree of Bachelor of Science in Electrical Engineering is structured to provide a foundation in both the basic sciences and the specialized areas of electrical engineering. The program also has sufficient humanities and social science electives to enhance the cultural growth of the students and develop professionals with a strong social awareness. The faculty seeks to keep classes small enough to allow effective interaction with students.

The Electrical Engineering Department maintains a number of laboratory facilities to support the undergraduate teaching program. These laboratories are devoted specifically to circuits, communications, digital systems, electronics, image processing, machinery, microprocessors, and power electronics and drives. Minicomputer, microcomputer and personal computer facilities are also provided within the department.

Students in the senior year may choose from a wide spectrum of courses covering all aspects of electrical engineering. They must meet the depth, breadth, and degree requirements of the department in their selection of these courses. This requirement is met by taking a two course sequence in one of the core areas of systems, power, electronics, communications, and computers. The breadth requirement is met by taking courses in other core areas, or courses in computer vision, fusion, plasma engineering, power electronics, and emerging technologies. Students are encouraged to discuss an appropriate senior project with their advisors. The selection of a major in the electrical engineering program is based on an association with established College of Engineering Policy. The electrical engineering program is based on a series of integrated courses. Students who complete the core through the coursework in a sequential manner guided by prerequisite and corequisite courses in the enchancement curriculum. This integrated sequentially developed program is high-lighted by the systematic inclusion of the design process introduced in the sophomore year and culminating in a major meaningful engineering design experience in the junior year.

Generally all sophomores and junior level courses of the department are offered every term. Senior level courses will normally be offered either in the fall or spring semester. This arrangement allows flexibility, since the student may select the normal four year schedule, or may choose an accelerated schedule, or may participate in the Cooperative Engineering Program. Where one course is a pre-requisite for another, the first course of the sequence will be offered in the fall semester. In all courses where prerequisites are indicated, they must be strictly followed. Progression in the Electrical Engineering program is based on the successful completion of all required freshman courses. In order to be eligible for enrollment in EE 201, students must have completed all courses listed in the freshman year of the engineering curriculum. Students must make application for enrollment in EE 201 in the EE department during the semester prior to anticipated enrollment. The application must be submitted to the EE Department Office.

To be eligible for the Bachelor of Science degree in Electrical Engineering, a student must achieve a cumulative grade point average of at least 3.00 in all EE courses taken at The University of Tennessee, Knoxville. At least 30 hours of upper division Electrical Engineering courses, including EE 400, and courses to meet the breadth and depth requirement of the department, must be earned at The University of Tennessee, Knoxville.

GRADUATE

Graduate programs and research programs for the degrees of Master of Science and Doctor of Philosophy in Electrical Engineering are offered for students with career goals such as advanced design, research and teaching. Students admitted to the graduate program are expected to have a minimum point average of 3.0 for all undergraduate study, and for the senior year. Students with a B.S. or B.A. degree in a field other than Electrical Engineering are required to take certain EE undergraduate courses before beginning the graduate program. See the Graduate Catalog for complete details on the graduate program.

ENGINEERING PHYSICS

Professor Lee L. Radfanger (Head) Professor Edward L. Hart, Coordinator

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

ENVIROMENTAL ENGINEERING (see Civil Engineering)
The undergraduate curriculum in industrial engineering provides a strong background in both fundamental engineering principles and the analytic methods necessary for solving the multi-faceted problems associated with the production, maintenance, and delivery of goods and services. In particular, this curriculum emphasizes the knowledge and skills necessary to design, integrate, or systemize processes of people, materials, equipment, and energy wherever they are found, such that the overall system functions at an optimal level and such that the needs of the human components of the system are adequately met. This curriculum, which is built upon a strong belief in the need for coordination and statistics, includes fundamental coursework in all of the engineering sciences, introductory economics and accounting, training in fundamental human factors which influence engineering design, the economic analysis of alternative design choices, quality control techniques, manufacturing processes and materials, production and inventory control, design and control of material handling systems and facilities design, the mathematical modeling and simulation of complex systems, and the design and installation of information acquisition and control systems. The technical and non-technical executive笙ure better alike the students to specialize in an area(s) which meets particular needs.

The solid, broad base in engineering, combined with training in applying engineering methodology to traditionally non-engineering problem areas as provided through the industrial engineering curriculum, leads to participation by industrial engineers in an unlimited range of fields, including, among others, retail distribution, banking, health care delivery, corporate management, transportation, manufacturing, human systems, research groups, and government as well as in the traditional area of manufacturing.

MATERIALS SCIENCE AND ENGINEERING

Programs:

Assistant Professors: R.E. Ford, Ph.D. Tennessee; M.W. Howard (Adjunct), Ph.D. Tennessee; J.E. Sivak, Ph.D. Tennessee; P.S. Sawhney, Ph.D. Tennessee.

INDUSTRIAL ENGINEERING

Under the industrial engineering concentration, students may select either the thesis or non-thesis option. The thesis option requires 24 hours of coursework and 6 hours of thesis. The non-thesis option requires 30 hours of coursework plus a 3-hour industrial design project.

Depending upon the student's background and career objectives, graduate work in industrial engineering involves the student to select an area of specialization from operations research, manufacturing systems, human factors engineering, quality engineering, or general industrial engineering. It is also possible for a student to select minors in engineering, mathematics, psychology, business, computer science, statistics, or economics.

ENGINEERING MANAGEMENT

The engineering management concentration has an additional admission requirement of two years' industrial experience as a practicing engineer or scientist, or current full-time employment in an appropriate engineering or applied science position. The program non-thesis and requires 33 hours of coursework plus a 3-hour capstone project.

GRADUATE STUDY PROGRAMS

The Department of Industrial Engineering offers a graduate program leading to the Master of Science degree in Industrial Engineering, concentrations in traditional industrial engineering and engineering management. The Ph.D. with a major in Engineering Science is available through the Department of Engineering Science and Mechanics; a concentration in industrial engineering is available as well.

Students who wish to enroll in the Master of Science degree may select a concentration in either industrial engineering or engineering management. Admission is open to graduates of ABET-accredited undergraduate curricula in engineering, or to graduates of other technical curricula who satisfy principal areas depending on their academic backgrounds and industrial experiences. Policies concerning pre-requisites and application requirements will be determined by the Industrial Engineering faculty.

A minimum of 28 hours is required in the industrial engineering degree program at UT Knoxville to be considered for graduate credit in the M.S. degree program.

MATERIALS SCIENCE AND ENGINEERING

MSc. Science and Engineering is concerned with the science and technology needed to develop and apply materials for the benefit of society. The undergraduate program is designed to provide education and training in the fundamental and engineering sciences with special attention given to the production, development and utilization of materials. Emphasis is placed on developing expertise needed to develop methods in the selection, development and production of materials for major engineering systems. The program strives to develop in its graduates the ability to specify materials requirements, select materials, characterize materials, and develop applications to develop the expertise and knowledge base for the future.

The BACHELOR OF SCIENCE PROGRAM

The Bachelor of Science program in Materials Science and Engineering is concerned with the science and technology needed to develop and apply materials for the benefit of society. The undergraduate program is designed to provide education and training in the fundamental and engineering sciences with special attention given to the production, development and utilization of materials. Emphasis is placed on developing expertise needed to develop methods in the selection, development and production of materials for major engineering systems. The program strives to develop in its graduates the ability to specify materials requirements, select materials, characterize materials, and develop applications to develop the expertise and knowledge base for the future.

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AEROSPACE

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. Auxillary and propulsion systems are also an integral part of this education. These include guidance, control, environmental, structural, rocket, turbojet, and power system engines. Emphasis in the senior year is directed toward major topics and the program culminates in a major aerospace design project.

MECHANICAL AND AEROSPACE ENGINEERING AND SCIENCE

Graduate students in the Department of Mechanical Science and Engineering have the opportunity to study various aspects of the field of aerospace aerospace. The program can include courses required in the mechanical, aerospace, or biomedical disciplines. Students receive a solid foundation in the basic sciences, including physics, chemistry, and mathematics, with an emphasis on such areas as applied mathematics, the engineeringsciences, and modern computational techniques. Thus they are prepared to go directly into engineering practice at the baccalaureate level or to continue formal engineering education in a Master's or PhD program.

GRADUATE STUDY PROGRAMS

GRADUATE STUDY PROGRAMS

The Engineering Science degree program, science and engineering programs leading to the degrees for either M.S. or Ph.D. are offered in the Graduate Catalog.
PROGRESSION TO UPPER-DIVISION PROGRAMS

Progression to Upper-Division Programs is competitive and is based on departmental capacity. Factors considered include overall grade point average, performance in selected lower-division courses, and evidence of satisfactory factory and orderly progress through the prescribed curriculum. Progression is granted to students with GPAs greater than 2.0, however, space available is granted on a priority basis.

Full Status: A Lower Division student in the department may apply for progression to Upper Division Programs after completing 47 semester hours of Lower Division engineering curriculum course work with an overall GPA of at least 2.4.

 Provisional Status: Students who have completed 47 semester 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 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 abilities to perform satisfactorily in Upper Division courses by attaining a minimum GPA of 2.0 in at least 30 semester hours of upper-division courses as specified by the department. Further admission to upper division courses is dependent upon this minimum level of performance.

Any student with an overall GPA below 2.0 will not be admitted to an Upper Division Program. Students who have not been progressing to an Upper Division Program will be dropped from departmental class rolls.

Transfer Students: At the Upper Division level, students are admitted on a Provisional Status basis only. Any student presenting more than 28 semester hours is considered a Transfer Student.

Loss of Full Status: Students who progress to Upper Division Programs are expected to maintain an overall GPA of at least 2.0 and a departmental GPA of at least 2.0 in departmental courses. Failure to maintain this minimum level of performance will result in a review of the overall progress of the student through the prescribed curriculum and probable loss of Full Status.

Degree Graduation Requirements: A minimum cumulative grade point average of 2.0 for both full and provisional status courses is required at UT Knoxville for graduation. This is in addition to the University's graduation requirements.

GRADUATE STUDY PROGRAMS

Graduate programs leading to the degrees of Master of Science and Doctor of Philosophy with a major in mechanical engineering or aerospace engineering are available to graduates of other curricula who satisfy the necessary prerequisites. The general requirements for advanced degrees are summarized in the Graduate Catalog.

Graduate programs leading to the degree of Bachelor of Science and Doctor of Philosophy with a major in mechanical engineering are summarized in the Graduate Catalog.

Curriculum for Master of Science and Doctor of Philosophy Programs

PREREQUISITES: Students must satisfy the prerequisites listed in the Graduate Catalog. Questions about individual courses should be directed to the department responsible for the course. Questions about a particular curriculum should be directed to the major department.

Advising conferences for all students are arranged to meet individual needs or interests. The student's program of study must be approved by his or her advisory committee and must comply with the requirements of the Graduate School.

NUCLEAR ENGINEERING

ADVISORY COMMITTEE: All graduate study programs in Nuclear Engineering are available to graduates of recognized curricula in mathematics, computer science or one of the physical or biological sciences may also qualify for admission depending upon their background. Each applicant is advised to consult any prerequisite courses needed to attain a particular program. Program options include solid and fluid mechanics (with emphasis toward computational techniques), biomaterials engineering, artificial intelligence applications, computer materials, and fracture mechanics. Interdisciplinary programs are available to meet individual interests or needs. The student's program of study must be approved by his or her advisory committee and must comply with the requirements of the Graduate School.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing academic programs allows legal residents of some states to attend in certain programs at UT Knoxville on an in-state tuition basis. The undergraduate program in Nuclear Engineering at UT Knoxville is an in-state tuition basis. The undergraduate program in Nuclear Engineering at UT Knoxville is an in-state tuition basis.

CURRICULA

Graduate programs leading to the degrees of Bachelor of Science and Doctor of Philosophy with a major in nuclear engineering are summarized in the Graduate Catalog. Graduate programs leading to the degrees of Bachelor of Science and Doctor of Philosophy with a major in mechanical engineering or aerospace engineering are available to graduates of other curricula who satisfy the necessary prerequisites. The general requirements for advanced degrees are summarized in the Graduate Catalog.

GRADUATE STUDY PROGRAMS

Graduate programs leading to the degree of Bachelor of Science and Doctor of Philosophy with a major in mechanical engineering or aerospace engineering are available to graduates of other curricula who satisfy the necessary prerequisites. The general requirements for advanced degrees are summarized in the Graduate Catalog.

Graduate programs leading to the degree of Bachelor of Science and Doctor of Philosophy with a major in mechanical engineering or aerospace engineering are available to graduates of other curricula who satisfy the necessary prerequisites. The general requirements for advanced degrees are summarized in the Graduate Catalog.

Graduate programs leading to the degree of Bachelor of Science and Doctor of Philosophy with a major in mechanical engineering or aerospace engineering are available to graduates of other curricula who satisfy the necessary prerequisites. The general requirements for advanced degrees are summarized in the Graduate Catalog.

Graduate programs leading to the degree of Bachelor of Science and Doctor of Philosophy with a major in mechanical engineering or aerospace engineering are available to graduates of other curricula who satisfy the necessary prerequisites. The general requirements for advanced degrees are summarized in the Graduate Catalog.

Graduate programs leading to the degree of Bachelor of Science and Doctor of Philosophy with a major in mechanical engineering or aerospace engineering are available to graduates of other curricula who satisfy the necessary prerequisites. The general requirements for advanced degrees are summarized in the Graduate Catalog.
<table>
<thead>
<tr>
<th>Class</th>
<th>Humanities &amp; Social Sciences Electives</th>
<th>Electrical Engineering Electives</th>
<th>Mechanical Engineering Electives</th>
<th>Engineering Science Electives</th>
<th>Hours Credit</th>
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</table>

*All electives must be approved by the student's faculty advisor and the department head. Technical electives (including biomedical engineering courses) are chosen to form a biomedical engineering endorsement. Writing and pre-clinical programs must include cell biology and organic chemistry courses as part of the technical electives.*
## MATERIALS SCIENCE AND ENGINEERING

<table>
<thead>
<tr>
<th>Hours Credit</th>
<th>Sophomore</th>
<th>Matrics and Science and Engineering 201</th>
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<th>Mathematics 203, 231, 241</th>
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<th>Basic Engineering 201</th>
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<th>Electrical Engineering 201, 232</th>
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## MECHANICAL ENGINEERING

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## NUCLEAR ENGINEERING:

### FISSION REACTOR ENGINEERING CONCENTRATION

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### RADIATION ENGINEERING CONCENTRATION

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