College of Engineering

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Modern technological developments in engineering have brought about considerable change in the College of Engineering’s curriculum at Wichita State University. The curriculum provides graduates the skillset, mindset, and experience necessary to rapidly advance economic and technological prosperity, health, and well-being. Consequently, WSU graduates are increasingly attractive to employers and graduate programs throughout the United States.

The College of Engineering is organized into five degree-granting departments: aerospace, biomedical, electrical and computer science, industrial, systems and manufacturing, and mechanical. In addition, the College of Engineering offers a Bachelor of Science in engineering technology.

The programs in engineering are offered in daytime and evening classes, and the courses are the same whether they are taught in the day or at night.

Admission
All entering students with a declared interest in engineering will be admitted to the College of Engineering in program status. Engineering students must complete the following courses, each with a grade of C or better, within the first 48 credit hours:

1. ENGL 100/ENGL 101, ENGL 102 and COMM 111, and
2. MATH 242, or their equivalents.

Transfer students must present an earned GPA of 2.000 or higher on a 4.000 scale for all prior college work in order to be fully admitted into the College of Engineering. Transfer students with a GPA of less than 2.000 may petition for probationary admission.

Probation
Students are placed on academic probation if any of the following grade point averages is less than 2.000 and if they have attempted at least 6 credit hours at Wichita State University:

1. Cumulative grade point average of all college/university work,
2. WSU grade point average, and
3. Engineering major grade point average.

An attempted course indicates that the student has enrolled officially in the course and that the student may have completed the course or been granted an incomplete. Attempts include courses receiving the grades (to include plus/minus grades) A, B, C, D, F, Cr, NCr, Bg, NBg, S, U and I but exclude Au, CR, and W. Academic probation is not removed until all grade point averages are at least 2.000. Transfer students admitted on probation must complete at least 12 hours of credit work at Wichita State before probation may be removed.

Students on academic probation may not enroll for more than 12 credit hours in a 16-week term, 6 credit hours in an eight-week term, or 3 credit hours in a four-week term. Exceptions to these limitations may be made on the recommendation of the student’s department advisor with the approval of the student’s department chairperson.

Academic Dismissal
Students on academic probation will be dismissed at the end of a semester if they fail to earn a semester grade point average at or above 2.000, and have a cumulative, overall WSU, or engineering major grade point average below 2.000. Students are not academically dismissed at the end of a semester unless they began that semester on academic probation. Students will remain on probation as long as their cumulative, overall WSU, or engineering major grade point average is below 2.000.

Dismissal from the college because of poor academic performance constitutes dismissal from the university. Dismissed students should immediately consult with their advisor to explore options and conditions for future readmission.

Academic Advising and Enrollment
Students in the College of Engineering are required to receive academic advising from their advisor or department chair before enrolling. Engineering students are strongly urged to register early for courses during published registration dates to avoid closed classes. Late registration or adding engineering courses will be allowed only during the first week of a regular semester or the first three days of a summer session.

Students in the College of Engineering may not enroll in more than 20 hours per semester during the academic year. Summer session enrollments are limited to a maximum of 5 credit hours for each four-week session or 10 credit hours during the eight-week session. Students who have completed at least 24 credit hours at WSU with a WSU grade point average of 3.000 or higher may petition their department chairperson for permission to enroll in excess hours.

Students who are employed full or part time should, in consultation with their academic advisor, reduce their enrollment to a level appropriate to their work load.

Only students admitted to the College of Engineering or the Graduate School will be allowed to enroll in engineering courses. The academic dean will consider petitions for exceptions to the preceding statement because of legitimate reasons for qualified nonengineering students enrolling in engineering courses.

Transfer Credit
Students wishing to receive transfer credits for engineering courses taken at other institutions prior to admission to WSU must submit transcripts, course descriptions and syllabi to the College of Engineering for evaluation.

Degree-bound WSU students should speak with an advisor before enrolling in courses at another institution.

Undergraduate
The Bachelor of Science degree programs in aerospace engineering, biomedical engineering, computer engineering, electrical engineering, industrial engineering, manufacturing engineering; and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The Bachelor of Science degree program in computer science is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org. A Bachelor of Science degree in engineering technology is accredited by the

**Graduate**

A Master of Science (MS) is offered in computer networking, computer science and aerospace, biomedical, electrical, industrial and mechanical engineering. A Master of Engineering Management (MEM) program is offered in the industrial, systems and manufacturing engineering department. A Doctor of Philosophy (PhD) also is offered by the aerospace, electrical and computer science, industrial, systems and manufacturing, and mechanical departments.

Typical fields of specialization include aerodynamics, fluid mechanics, propulsion, structures, solid mechanics, composites, dynamics and control; communication theory, computer networking, signal processing, software engineering, control theory, digital systems, energy and power systems; thermodynamics, heat transfer, engineering materials, engineering design and kinematics; and operations research, management science, manufacturing processes and human factors.

See the Wichita State University Graduate Catalog for more information about the graduate programs.

**Certificates**

The College of Engineering offers graduate certificates in advanced composite materials, foundations of six sigma and quality improvement, lean systems, and systems engineering and management. A certificate in enterprise systems and supply chain management is offered jointly with the College of Business, and a graduate certificate in engineering education is offered jointly with the College of Education.

**Graduation Requirements**

All engineering students who are pursuing bachelor’s degrees must meet three sets of course requirements for graduation:

1. WSU general education requirements,
2. College of Engineering requirements, and
3. ABET requirements. Guidelines for these are given below:

**WSU General Education Requirements**

1. Foundation courses: All WSU students must complete three courses in communication skills: ENGL 101 or ENGL 100 (for non-native speakers), ENGL 102 and COMM 111, each with a grade of C or better and within their first 48 credit hours.
2. Four introductory courses in the disciplines, to include one course in fine arts, one course in humanities, and two courses in two different disciplines in social and behavioral sciences.
3. One advanced further study course in humanities or social and behavioral sciences (may not be taken in PHIL).
4. One issues and perspectives course: PHIL 354 for students majoring in computer engineering or computer science, or PHIL 385 for all other engineering majors.

All WSU students also must complete courses in the division of mathematics and natural sciences; however, because the engineering curriculum requires 32–35 credit hours of mathematics and natural sciences, engineering students automatically satisfy the requirements in this division.

Refer to the General Education Program (http://catalog.wichita.edu/undergraduate/general-education-program) for a description of the introductory courses, advanced further study courses, and advanced issues and perspectives courses.

**College of Engineering Requirements**

1. PHIL 385, is a required course for engineering students, while PHIL 354 is required for students in computer engineering and computer science.
2. Mathematics and natural sciences: 32–35 credit hours of mathematics and natural sciences must be completed, as prescribed by each department.
3. Engineering core requirements:
   - AE 223 Statics 3
   - EE 282 Circuits I 4
   - IME 255 Engineering Economy 3
   - ME 398 Thermodynamics I 3

   Total Credit Hours 13

These are courses that all engineering students must complete, regardless of major. Computer science students are required to take:

- IME 255 Engineering Economy 3
- PHIL 325 Formal Logic 3

4. Department requirements: Each department has specific courses that must be completed. These courses and their prerequisites are in the departmental sections of the catalog and are listed on the departmental check sheets.
5. Technical electives: Additional courses required, but not specified, by the department. Each should be chosen in consultation with a departmental advisor.
6. In response to the recommendation of the National Academy of Engineering report on the future needs for engineering graduates, the College of Engineering implemented the Engineer of 2020 program. To fulfill the requirements for an engineering Bachelor of Science degree at WSU, each student will complete the program requirements including at least three of the following six activities: undergraduate research, cooperative education or internship, global learning or study abroad, service learning, leadership and multidisciplinary education. This program will make the educational experience more meaningful to the student and the student more desirable to local and national industries. More details about the program can be found on the College of Engineering website.

**Inter-College Double Major**

An inter-college double major allows a student to complete an academic degree and major in one of the professional colleges (Barton School of Business, College of Education, College of Engineering, College of Fine Arts, College of Health Professions) along with a major in Fairmount College of Liberal Arts and Sciences. For details see Inter-College Double Major (http://catalog.wichita.edu/undergraduate/academics/graduation/double-major).

**Requirements**

ABET (http://www.abet.org) expects the curricular content of an engineering program to include the equivalent of at least three years of study in the areas of mathematics, basic sciences, humanities and social sciences, and engineering topics. The coursework must include at least:

1. One year combination of college level mathematics and basic sciences (some with experimental experience).
2. One and one-half years of engineering topics, consisting of engineering sciences and engineering design appropriate to the student’s field of study, and
3. A general education component that complements the technical content of the curriculum.
Basic sciences are defined as biological, chemical and physical sciences. They include both general chemistry and calculus-based general physics at appropriate levels, with at least a two-semester sequence of study in either area. The courses in humanities and social sciences must provide both breadth and depth and not be limited to a selection of unrelated introductory courses. Engineering topics include subjects in the engineering sciences and engineering design. The engineering sciences have their roots in mathematics and basic sciences but carry knowledge further toward creative application. These studies provide a bridge between mathematics and basic sciences on the one hand and engineering practice on the other. Engineering design is the process of devising a system, component or process to meet desired needs. It is a decision-making process (often iterative), in which the basic sciences, mathematics and the engineering sciences are applied to convert resources optimally to meet these stated needs.

All engineering students follow about the same general curriculum for the first two years. All engineering and computer science programs of study are designed to meet ABET criteria as well as satisfy WSU general education requirements, and all courses should be selected with the assistance of a College of Engineering advisor. The recommended sequence of courses for engineering students in all departments is outlined later in this section. Each sequence has been planned so that students can complete the program to meet all requirements in the minimum time.

Students must file an application for degree card in the student records office two semesters preceding their final semester.

**Graduation grade point average requirements:** The candidate for a degree must attain a 2.000 grade point average in each of the following categories:

1. All college and university work attempted (cumulative grade point average);
2. All work attempted at WSU (WSU grade point average); and
3. All work in the student’s major, which includes technical electives.

Students are not allowed credit toward graduation for *D* grade work in excess of one-quarter of their total hours.

**Cooperative Education Program**

The College of Engineering offers a cooperative education program in conjunction with the university Cooperative Education Internship Program described in this catalog.

The co-op plan is a voluntary program in which the student works part time (parallel program) or alternates paid preprofessional work periods with classroom periods during the junior and senior years. The two most typical plans are illustrated in the following table.

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C Indicates in college W Indicates at work

These plans make it possible for each industrial position to be filled by two students, one from Plan A and one from Plan B. Other plans can be developed in cooperation with the coordinator.

To be eligible for the co-op program, a student must have completed 24 credit hours and must demonstrate by academic performance during the freshman year the potential to complete the degree program satisfactorily. Generally this means the earning of a grade point average of 2.750 or higher. Also the student’s character and personality must be acceptable to the cooperating employer. Transfer students with the above qualifications should contact the cooperative education coordinator at the beginning of their first semester at WSU. To continue in the program, a student must maintain a satisfactory academic standing.

Students interested in participating in the program should contact the College of Engineering co-op coordinator who will provide the necessary application information. Upon acceptance into the program, the coordinator will assist the student in arranging interviews with cooperating industries.

**Courses in Engineering - General**

- Engineering (ENGR) (http://catalog.wichita.edu/undergraduate/courses/engr)
- WSU General, First-Year Seminar (WSUE) (http://catalog.wichita.edu/undergraduate/courses/wsue)