

GALLOGLY COLLEGE OF ENGINEERING

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General Information

Instruction in professional engineering was first given at the University of Oklahoma in 1899 when a course in surveying was offered. The following year, 1900–01, the first two years of engineering were presented. In 1902–03 a curriculum in civil engineering was established, and a School of Mines was organized. At the same time, courses in electrical and mechanical engineering were listed. In 1904 the courses in engineering were organized as a School of Applied Science. In 1909 the School of Mines and the School of Applied Science were joined and reorganized as the College of Engineering. The first professional degrees were conferred in 1909.

The college has grown substantially since that time. It now offers degrees in 11 undergraduate engineering fields, as well as computer science and environmental science. The student body includes approximately 3,500 undergraduate students and 600 graduate students. Its facilities fill eight major buildings with research facilities in portions of six other buildings.

In recent years, the College has been a major contributor to the philosophy of modern engineering education. It was one of the first to develop and adopt the “core” type engineering curricula now prevalent throughout the country. It was also one of the first to use the new approach to engineering laboratory work, wherein the student’s creativity is developed through the planning and carrying out of the experiment as an exercise in engineering analysis and design. Thus, the curricula in engineering are constantly being updated and modified to meet the needs of industry and future graduate work, increase the versatility of the student, and prolong the usefulness of the material taught.

The college is organized into schools and departments with the responsibility for administering the undergraduate and graduate programs of study, or curricula, as listed in the later pages of this catalog. The professional subjects in these curricula are supported by courses from other colleges of the University. Upon satisfactory completion of one of the curricula, a student will be recommended for a degree, in most cases qualified by the name of the engineering field pursued.

Faculty

The University of Oklahoma celebrated its centennial of engineering education in the 2009-10 academic year. As the Gallogly College of Engineering completes its first hundred years and looks forward to the next, the faculty is dedicated to excellence in carrying out the

University mission of teaching, research and service. The faculty are drawn from many of the nation’s leading universities, including University of California, Georgia Tech, MIT, Rice, and Yale, to name a few. Over one in four faculty members in the college hold an endowed chair or professorship, and one in five hold Presidential Professorships. Four hold University of Oklahoma David Ross Boyd Professorships and eight hold George Lynn Cross Research Professorships. Many of them are recognized as Fellows of national professional societies. In addition, several of the faculty members advise student organizations, including design teams that compete at the championship level in national and international competitions.

Computing

The OU Network consists of a high-speed backbone with connections to faculty, staff, laboratory, and classroom computers. Wireless technology extends the network to cover the engineering buildings, outside areas, laboratories, and classrooms. For more detailed information, visit the OU Information Technology Support page.

Accreditation of Programs

The following programs are accredited by the Engineering Accreditation Commission (EAC) of ABET: Aerospace Engineering, Architectural Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Engineering Physics, Environmental Engineering, Industrial & Systems Engineering, and Mechanical Engineering. The Computer Science program is accredited by the Computing Accreditation Commission (CAC) of ABET.

Programs Offered

- School of Aerospace and Mechanical Engineering
 - Aerospace Engineering, Bachelor of Science in Aerospace Engineering
 - Mechanical Engineering (Standard), Bachelor of Science in Mechanical Engineering
 - Mechanical Engineering (Premedical Option), Bachelor of Science in Mechanical Engineering
 - Aerospace Engineering, Bachelor of Science in Aerospace Engineering/Master of Science
 - Mechanical Engineering (Standard), Bachelor of Science in Mechanical Engineering/Master of Science
 - Aerospace Engineering, Master of Science
 - Mechanical Engineering, Master of Science
 - Aerospace and Mechanical Engineering Doctoral Programs
- Stephenson School of Biomedical Engineering
 - Biomedical Engineering (Standard), Bachelor of Science in Biomedical Engineering
 - Biomedical Engineering, Bachelor of Science in Biomedical Engineering/Master of Science
 - Biomedical Engineering, Master of Science
 - Biomedical Engineering Doctoral Programs
- School of Chemical, Biological and Materials Engineering
 - Chemical Engineering (Standard), Bachelor of Science in Chemical Engineering
 - Chemical Engineering (Biotechnology Option), Bachelor of Science in Chemical Engineering
 - Chemical Engineering (Pre-Medical/Biomedical Engineering), Bachelor of Science in Chemical Engineering

- Chemical Engineering (Standard), Bachelor of Science in Chemical Engineering/Master of Science
- Chemical Engineering (Biotechnology), Bachelor of Science in Chemical Engineering/Biomedical Engineering, Master of Science
- Chemical Engineering (Pre-Medical/Biomedical Engineering), Bachelor of Science in Chemical Engineering/Biomedical Engineering, Master of Science
- Chemical Engineering, Master of Science
- Chemical, Biological, and Materials Engineering Doctoral Programs
- School of Civil Engineering and Environmental Science
 - Architectural Engineering, Bachelor of Science in Architectural Engineering
 - Civil Engineering, Bachelor of Science in Civil Engineering
 - Environmental Engineering, Bachelor of Science in Environmental Engineering
 - Environmental Science, Bachelor of Science in Environmental Science
 - Environmental Science Engineering, Minor
 - Water and Sanitation for Health and Sustainable Development, Minor
 - Architectural Engineering, Bachelor of Science in Architectural Engineering/Civil Engineering, Master of Science
 - Civil Engineering, Bachelor of Science in Civil Engineering/Master of Science
 - Environmental Engineering, Bachelor of Science in Environmental Engineering/Master of Science
 - Environmental Science, Bachelor of Science in Environmental Science/ Master of Environmental Science
 - Civil Engineering, Master of Science
 - Environmental Engineering, Master of Science in Environmental Engineering
 - Environmental Science, Master of Environmental Science
 - Environmental Science: Hydrology and Water Security Online, Master of Environmental Science
 - Civil Engineering and Environmental Science Doctoral Programs
- School of Computer Science
 - Computer Science, Bachelor of Science in Computer Science
 - Computer Science, Minor
 - Computational Technology, Minor
 - Computer Science, Bachelor of Science in Computer Science/ Master of Science
 - Computer Science, Master of Science
 - Computer Science Doctoral Programs
- Program in Data Science and Analytics
 - Data Science and Analytics, Master of Science
 - Data Science and Analytics Graduate Certificates
- School of Electrical and Computer Engineering
 - Computer Engineering, Bachelor of Science in Computer Engineering
 - Electrical Engineering, Bachelor of Science in Electrical Engineering
 - Electrical and Computer Engineering, Minor
 - Computer Engineering, Bachelor of Science in Computer Engineering/Computer Science, Master of Science
 - Computer Engineering, Bachelor of Science in Computer Engineering/Electrical and Computer Engineering, Master of Science
 - Electrical Engineering, Bachelor of Science in Electrical Engineering/Electrical and Computer Engineering, Master of Science
 - Electrical and Computer Engineering, Master of Science
 - Electrical and Computer Engineering Doctoral Programs
- Department of Engineering
 - Engineering, Master of Science
 - Engineering Doctoral Programs
- Program in Engineering Physics
 - Engineering Physics, Bachelor of Science in Engineering Physics
 - Engineering Physics, Master of Science
 - Engineering Physics Doctoral Programs
- School of Industrial and Systems Engineering
 - Industrial and Systems Engineering, Bachelor of Science in Industrial and Systems Engineering
 - Industrial and Systems Engineering: Analytics, Bachelor of Science in Industrial and Systems Engineering
 - ISE: Pre-Medicine, Bachelor of Science in Industrial and Systems Engineering
 - Industrial and Systems Engineering, Bachelor of Science in Industrial and Systems Engineering/Master of Science
 - Industrial and Systems Engineering: Analytics, Bachelor of Science in Industrial and Systems Engineering/Master of Science
 - Industrial and Systems Engineering, Bachelor of Science in Industrial and Systems Engineering/Master of Business Administration
 - Industrial and Systems Engineering, Master of Science
 - Industrial and Systems Engineering Doctoral Programs
- Program in Telecommunications
 - Telecommunications Engineering: Non-thesis, Master of Science
 - Telecommunications Engineering: Thesis, Master of Science

Programs & Facilities

The main Gallogly College of Engineering complex is located on the northeast corner of the University's Norman campus. The six-story Carson Engineering Center includes classrooms and laboratories for civil and environmental engineering and environmental science, and industrial engineering. Felgar Hall houses laboratories and facilities for aerospace and mechanical engineering, the Engineering Library, and the Williams Student Services Center (WSSC). Sarkeys Energy Center houses chemical engineering and the bioengineering program. Devon Energy Hall has classrooms, team and forum rooms, and laboratories for computer science, computer engineering, and electrical engineering. The Exxon-Mobil Lawrence G. Rawl Engineering Practice Facility houses competition teams, student leadership center, Information Technology (IT), Sooner Engineering Education Center (SEED), and is the home for engineering outreach. Every year, thousands of K-12 students visit the facility to observe engineering students design, build, and test their projects, as well as work with engineering students on a variety of hands-on projects. The Stephenson Research and Technical Center, located on the Research Campus, houses additional offices and labs for the bioengineering program. Several other smaller buildings for research purposes complete one of the finest engineering education complexes in the Southwest.

The other laboratories of the college are well-equipped to demonstrate the principles of courses offered and are described in other sections of this catalog. Through these laboratories and the actual use of apparatus, instruments, and equipment a student is able to make practical applications of the theories and principles which he/she has learned in the classroom. Students of the college are active in fieldwork. In addition, laboratories and other facilities of the College are used by the students and faculty members not only in their regular work, but also for research and experiments, which are of benefit to the industrial development of the state.

Undergraduate Study

Undergraduate Advising at Williams Student Services Center

Whether you are a prospective or first-time student, or a continuing, or graduating student, the Williams Student Services Center serves as the "hub" for connecting with others, receiving guidance, and finding answers to your questions. See our advising team for basic information about academic programs and advising, scholarships, student groups, and organizations, diversity and multicultural programs, tutoring and mentorship, college events and graduation. See an advisor for questions regarding pre-requisites, academic performance, scholastic requirements, transfer equivalencies, or special regulations.

All students in the Gallogly College of Engineering are assigned a faculty advisor in their major field, and a college (WSSC) advisor who ultimately clears the student for graduation. If a student has not yet selected a specific engineering field, he/she will see an advisor in the Williams Student Services Center. Students risk delaying their graduation if they do not make a timely selection of a major. Students must be advised each semester by a faculty advisor in order to be cleared for enrollment. The Gallogly College of Engineering does not permit "self-advising." All engineering transfer students must meet with a college (WSSC) advisor and faculty advisor before enrollment into their first semester at OU.

All incoming engineering freshmen are advised during the University's Summer Enrollment and Orientation Program coordinated by University College (UC) and the OU Scholars Program. Freshmen must continue to be advised by a UC academic advisor until which time the student has attained:

- completion of 24 credits,
- completion of at least two semesters at OU,
- and possess the minimum 2.0 GPA.

All engineering students with more than 24 hours earned, must be advised each semester by faculty in their respective major and their assigned WSSC advisor. The majority of GCoE students now attend Lean Cell advising sessions. In these sessions, faculty advisors, department staff and WSSC advising professionals are present at a predetermined advising venue.

International & Global Opportunities (IGO)

Mission: To provide transformational, collaborative international opportunities that inspire and educate our students to become competent, compassionate, and ethically minded global citizens and leaders.

Education, and co-curricular experiences abroad for the Gallogly College of Engineering are offered through the International & Global Opportunities (IGO) office. These programs include engineering specific coursework, and opportunities for practice related service learning,

internships, and research. IGO programs are open to current engineering majors, and offered in collaboration with the University's Education Abroad Office and affiliate partner universities.

Engineering Laptop Policy

The Gallogly College of Engineering requires all incoming students to purchase a laptop to be used during their time at OU. Special student rates are available and machines can be purchased on site at the IT Store.

Admission to the Gallogly College of Engineering

The OU Gallogly College of Engineering uses the same admissions policies for accepting new students into its programs as that of the institution, with the exception of Aerospace Engineering and Mechanical Engineering applicants (AME).

Freshman Admission

Incoming freshman can apply one of two ways to the University of Oklahoma, either through the OU Application or the Common Application. OU does not give preference to one application over the other. All students are evaluated holistically regardless of application type.

Transfer Admissions

In addition to university-wide admission requirements, transfer students must meet the GPA requirements for their academic college.

Resident transfer: 2.5 combined GPA for students with less than 60 hours -or- 2.0 for students with 60 or more hours earned.

Non-resident transfer: The admission of non-resident transfer students is more restrictive for GCoE programs, and is administered on the college's behalf by the Office of Admissions and is as follows: 3.0 combined retention GPA regardless of the number of hours earned.

The Office of Admissions conducts all initial assessment of transfer coursework. Transfer students who wish to apply un-equated transfer courses towards degree completion must meet with a WSSC academic advisor for review. The advisor will direct student regarding process for final evaluation.

Major specific coursework must be reviewed and approved by the faculty in the specific area to apply toward degree requirements. In certain cases, the faculty may elect to approve a course for any student with a specific course, from a specific institution. In these cases, a memo is sent to the Director of Admissions, and the course is listed on the institution's Transfer Equivalency Database.

In addition, the Gallogly College of Engineering hosts an annual Engineering Transfer Conference during the spring semester, with faculty/staff from OU and surrounding transfer institutions. Engineering, mathematics, and science syllabi are reviewed for continued and/or new equivalency to OU engineering programs.

Note: No upper-division engineering courses appear on the Transfer Equivalency Tables, which is in keeping with the Gallogly College of Engineering regulation that at least 24 hours of junior and senior courses in the major be completed in residence at OU and in the College.

AME Admissions only:

For AME transfer students matriculating into the Oklahoma State System Fall 2015 or later: 3.0 combined GPA in 24 or more credit hours, C minimum in the following courses with 3.0 combined GPA:

Code	Title	Credit Hours
MATH 1914	Differential and Integral Calculus I	4
MATH 2924	Differential and Integral Calculus II	4
PHYS 2514	General Physics for Engineering and Science Majors	4
CHEM 1315	General Chemistry	5

Scholastic Requirements & Equivalencies

Academic Standards

Students in the Gallogly College of Engineering must meet the following academic standards:

- A minimum grade of C in each course required in the curriculum.
- Both an OU retention and a combined retention grade point average of 2.00 or higher.¹
- A 2.00 minimum combined retention average for all attempted courses presented to satisfy curriculum requirements. *Curriculum requirements include every course on the selected degree requirement sheet.*¹
- A 2.00 minimum OU retention average for all courses attempted at the University of Oklahoma used to satisfy curriculum requirements.¹
- A 2.00 minimum OU and combined retention average in all courses taken in the major field. Major field is defined by the degree field selected. The major field is defined by the degree program selected.¹
- No more than two unsuccessful attempts (D or less) in a course required in the curriculum.

¹ Note: Specific accelerated degree programs within the Gallogly College of Engineering may require a higher minimum grade point average. Please contact Williams Student Services Center (WSSC) 112 Felgar Hall for specific requirements.

For purposes of graduation and retention, these grade point averages may be affected by academic forgiveness policies. Students should consult the "Admissions, Enrollment and Student Financial Services" section of this catalog for more information.

Students who do not meet these standards will be notified by the Director of Advising, and will be required to meet with their assigned WSSC advisor, and undertake efforts to raise their grade point average.

The University of Oklahoma utilizes a 4.0 or A=4, B=3, C=2, D=1, F=0 system. The Gallogly College of Engineering requires:

- a minimum grade of C in any course applied toward degree completion
- does not accept P/NP coursework toward degree completion; S grades are permitted
- will permit S graded credits that result from Advanced Placement (AP), Departmental, higher level IBC, and CLEP exams toward program requirements and degree completion

Time Limitations on Coursework

A student may elect to graduate under the requirements for an undergraduate degree plan in effect at the time of his or her first enrollment in the state system, *provided that he or she completes the work for a degree within a maximum of six years*, which is reflected in the degree check. If the work for a degree covers a period longer than that specified by the College, the College will determine the degree plan to be in effect for that student's graduation.

A student whose initial enrollment in the state system is during the summer session will be subject to the University of Oklahoma catalog in effect for the year following that summer.

Credit in the student's major field or area of concentration that is more than 10 years old may not be applied toward a bachelor's degree unless it is validated by the major department, or by the departments in the student's area of concentration. (The term "area of concentration" is included in addition to "major field" to allow for those cases in which the equivalent of a major may be earned by a combination of work in several departments.)

Honor Roll

To be eligible for the Dean's Honor Roll, a full-time undergraduate student must earn at least 12 or more hours and attain a grade point average of 3.00 or higher during a regular fall or spring semester. Part-time students may qualify for the honor roll by earning at least six but less than 12 hours and attaining a grade point average of 3.00 or higher, provided they have no W's for that semester. There is no college honor roll during the summer session or during intersessions, and hours and grades earned during these sessions are not included in any way in determining eligibility for inclusion on regular semester honor rolls.

State-Mandated Articulation Agreements that Impact Engineering Programs

To facilitate the transfer of students within Oklahoma's state system of higher education, the state Board of Regents created the Oklahoma State Regents for Higher Education Course Equivalency Matrix. The Regents established a policy that Freshman- and Sophomore-level general education requirements are deemed satisfied for students who complete a two-year Associates of Arts or Associates of Science degree from an Oklahoma public college, and who transfer to a four-year university.

For these reasons, general education coursework readily transfers from Oklahoma colleges into OU. Additionally, if the student has completed the Associates of Arts or Associates of Science, and he/she earned a D in one of the general education courses used to complete that degree, the GCoE will accept the course toward degree completion unless it is a direct pre-requisite for an engineering course.

Advanced Standing

The Gallogly College of Engineering permits students who have mastered course content via work or military experience the option of credit per a Departmental (Advanced Standing) Exam in lower division courses. Such students must:

- Obtain an Advanced Standing form from the Office of Admissions and receive approval of the department responsible for awarding such credits prior to sitting for an exam.
- Once approved, the student submits the signed form to the Office of Admissions along with the exam fee, which is \$25 per credit hour for the course he/she intends to receive credit.

- The department arranges for a proctor, and determines the place and time of the exam.
- The department reports a grade of S for exam scores of 70% (C) or higher, U for scores of 69% (D) or less. Note: Only S grades for Departmental exams are posted to the student's record.

Enrollment & Major Declaration

Enrollment Limitations

School of Aerospace and Mechanical Engineering

Admission to the AME program is **required** *prior* to enrolling in any AME courses for the engineering major.

Enrollment into AME Courses

Students entering college in the Oklahoma State System of Higher Education prior to summer 2015 are required to earn a 2.80 overall GPA and complete the requisite courses listed in the first and second year on the degree sheet in order to advance into upper-division AME coursework.

Students entering college in the Oklahoma State System of Higher Education summer 2015 or after are required to accrue at least 24 credits with an overall retention GPA of 3.0 -and- successfully complete the following with a 3.0 overall retention GPA in these specific courses, with no grade less than C:

Code	Title	Credit Hours
MATH 1914 or MATH 1823	Differential and Integral Calculus I Calculus and Analytic Geometry I	4
MATH 2924 or MATH 2423	Differential and Integral Calculus II Calculus and Analytic Geometry II	4
PHYS 2514	General Physics for Engineering and Science Majors	4
CHEM 1315	General Chemistry	5

Pass/No Pass Course Enrollments

Pass/No Pass Course Enrollments may not be used to satisfy Gallogly College of Engineering course requirements. Engineering students may not proceed in their major courses until they have achieved a minimum grade of C in all prerequisites. All required courses listed on the official University of Oklahoma degree checksheet for any engineering major must be completed with a grade of C or better.

Minimum Grade Requirement/Course Repeats

Students may take a course in their curriculum only three times (this includes I, AU, W, AW, D, F). If the course is taken unsuccessfully three times and is a course required in all curricula in the College of Engineering, the student will receive a permanent Enrollment Stop from the Gallogly College of Engineering (Note: The first W, I AU, or AW is not counted in the "three attempts" rule). If the course is taken unsuccessfully three times and is required only in the major, the possibility of a student continuing in the Gallogly College of Engineering in a different major will be determined on an individual basis. When courses are repeated, the grade of the last attempt is the grade of record.

Enrollment in Upper-division Courses

Enrollment in upper-division Gallogly College of Engineering courses, except any courses specifically exempted in the General Catalog or Class Schedule, is restricted to students who are admitted to the Gallogly College of Engineering and in some cases to those admitted to a specific degree program, have completed the necessary grade and course prerequisites, and are advised into the classes by their engineering

faculty or staff advisor. Qualified students from outside the Gallogly College of Engineering are welcome in advanced courses if they have completed the necessary grade and course prerequisites, and are encouraged to explore specific interests with the schools and instructors involved. Approval must be obtained from the professor teaching the course and the Director of Advising in the Williams Student Services Center (WSSC), 112 Felgar Hall.

Conduct of Engineering Courses

A student is responsible for the prerequisite and the content of any course in which he or she is officially enrolled. The establishment of specific policy concerning class attendance requirements, as well as announced and unannounced examinations, is the responsibility of the individual instructor. When absences seriously affect a student's classwork, the instructor may report this fact to the Office of Academic Records and the information will be directed to the student's college dean.

The Gallogly College of Engineering requires final examinations to be given during the regularly scheduled examination periods in all undergraduate courses excluding directed readings, pure laboratory courses and project type design courses and seminars. No faculty member is authorized to depart from this regulation or from the published examination schedule for a class or an individual without prior approval. Special early examinations given to individual students or groups of students as substitutes for final examinations are prohibited. A student will not be expected to take more than two examinations in one day.

Academic Appeals

The Gallogly College of Engineering has established an Academic Appeals Panel to hear grade appeals and academic misconduct cases. To obtain the procedures to be followed, a student should contact the Dean's office in 107 Carson Engineering Center, and refer to Title 14 of the Student Code.

Credit Hour Load

Limits on the number of credit hours a student may enroll in each semester without special permission can be obtained from the OU Enrollment Services Office, Buchanan Hall room 230.

Change of Major Requests

Students interested in pursuing a change of major within engineering, or who are pursuing a major in another college on campus but wish to switch to an engineering program must meet with an academic advisor in WSSC to change majors. The advisor will assess the student's GPA and completed courses. If the student lacks necessary preparation to begin coursework in the major, the student might be advised to remain in their current major until they are adequately prepared for the course curriculum. Approved changes of major requests are only processed within the first 10 weeks of the semester, or after final grades are posted. In accordance with State Regents' requirements, students are assigned to the degree program year that was current at the time they entered the Oklahoma State System of Higher Education.

Graduation Requirements

The student must satisfy the following requirements:

- **Curricular Courses:** complete all prescribed curricular courses or equivalent courses as approved by the faculty with a minimum grade of C in each course.
 - Students graduating from a program accredited by the Engineering Accreditation Commission of ABET must complete 37.5% or 48 hours of engineering and 25% or 32

hours of combined mathematics (at the calculus level or above), physics, chemistry, or other science coursework.

- Students graduating from a program accredited by the Computing Accreditation Commission of ABET must complete a minimum of 40 hours in computing, 15 hours of mathematics and 30 hours of combined mathematics and science coursework with some exposure to laboratory work.
- **Two-year College Transfer Credits:** a minimum of 60 semester hours must be earned in a senior college or four-year school for a baccalaureate degree.
- **Degree Requirements:** fulfill all requirements listed on the official degree checksheet. Gallogly College of Engineering academic advisors in the Williams Student Services Center (WSSC) clear undergraduate degrees and encourage consultation remaining degree requirements. However, responsibility for meeting graduation requirements lies with the student.
 - Be in good academic standing with the College and the University.
 - Make application for the degree by the deadline date for the semester in which the student plans to graduate.
 - To ensure that the above conditions will be met, students are encouraged to request a degree check by completing the Graduation Check form in the Williams Student Services Center (WSSC). This action should be taken at least two semesters before the student expects to graduate. The student can access his/her degree audit at any time online through Degree Navigator.
- **Residence Requirements** — to be recommended for a degree, a candidate must have:
 - spent two semesters or the equivalent in residence, with at least one semester enrolled as a College of Engineering student;
 - completed at OU 36 of the hours listed in the junior and senior years on their curriculum checksheet, 24 of these 36 hours must be in the major field;
 - fulfilled the grade and grade point requirements of the College and School

NOTE: Academic credit from any division of the University of Oklahoma — Norman campus, OU Health Sciences Center, OU-Tulsa, or Continuing Education — is considered resident credit at the University of Oklahoma. Grades and hours earned at any of these divisions are included in the OU retention and cumulative grade point averages for purposes of determining completion of degree requirements.
- Three categories of degrees are offered in the Gallogly College of Engineering as follows:
 - **Bachelor of Science:** the Gallogly College of Engineering is organized into departments and schools. The degree of Bachelor of Science is qualified by the name of the engineering field pursued and is conferred upon graduates of the College.
 - **Distinction:** the College may recommend that the degree *With Distinction* be conferred on students who have a combined cumulative grade point average of 3.40 and *With Special Distinction* on students who have a combined cumulative grade point average of 3.70.
 - **Honors:** the Honors College may recommend the degree *cum Laude*, *Magna cum Laude* or *Summa cum Laude*. Special requirements, in addition to the regular requirements for graduation, are approved by the Honors College.

Degrees are formally conferred at spring commencement and convocation, and fall convocation exercises. However, degrees are also awarded in absentia at the end of summer session. All diplomas are

mailed to students following the official graduation date. The degree and date of the diploma are entered on the student's permanent academic record. The date of graduation is the last day of the semester or summer session in which all requirements for the degree are completed. When a student completes all requirements for a degree, other than at the close of a semester or summer session, the Office of Academic Records, upon request, will issue a certified statement that the student is eligible for the degree as of the date when the requirements for the degree were completed.

Graduate Study

Refer to the Graduate tabs within each of the Gallogly College of Engineering academic units' pages of this catalog for information concerning graduate work.

Opportunities

Gallogly Student Affairs Team (GSAT)

Student Life

Student Life serves to promote opportunities for students to participate in a variety of co-curricular, and educationally enhancing ways that foster professional development to our students. These engineering-related organizations include competitive student teams, professional and college-related organizations, student leadership, and more.

Honor Societies: In addition to university-wide honor societies and organizations the Gallogly College of Engineering has a robust participation in engineering professional honors societies such as: Pi Tau Sigma, Sigma Gamma Tau, Chi Epsilon, Eta Kappa Nu, Alpha Pi Mu, and Pi Epsilon Tau and well as general engineering honors societies such as Alpha Sigma Kappa and Tau Beta Pi.

Alpha Sigma Kappa

Alpha Sigma Kappa honorary society is a social sorority for technical majors that seeks to foster women supporting each other through an academic sisterhood. The chapter accepts undergraduate and graduate students in Architecture, Engineering, Mathematics and the Sciences.

Tau Beta Pi

The Tau Beta Pi honor society, which was founded at Lehigh University in June 1885, offers students of technical schools membership in an honorary association. Students who are qualified in any branch of engineering may become members. The annual election to the society, which is based upon scholarship, integrity, breadth of interest (both inside and outside of engineering), adaptability and unselfish activity, is limited to the upper one-fifth of the senior class and to the students who have grade averages within the upper one-eighth of the junior class. The government of the organization in each chapter is under the direction of the elected student officers and an advisory board consisting of four faculty members of Tau Beta Pi. Membership in Tau Beta Pi is one of the highest scholastic honors that an undergraduate engineering student can receive. The Oklahoma charter was granted in 1926.

Women in Engineering

The GCoE proudly supports the advancement and achievement of women in engineering and sciences. Our goal is to increase the participation of women within the engineering and sciences profession through outreach and programs that ensure the success of our students academically, socially and professionally. The Society of Women Engineers recently reported women make up only 20% of engineering undergraduates. However, the Gallogly College of Engineering reports just over 24% undergraduate women enrollment. The College serves to recruit, retain

and mentor women in engineering, as well as to foster viable connections with industry.

Deans Leadership Council

The Dean's Leadership Council (DLC) establishes connections leading to a strong sense of community within the Gallogly College of Engineering through student-to-student interaction. This community is built through service, dedication, respect, and honesty toward others, engineering as a profession, the Gallogly College of Engineering, and the University of Oklahoma. The Council members are engineering students with excellent academic credentials, leadership, and communication skills. They serve as mentors to freshman and transfer engineering students, tutors for courses in engineering curricula, and student recruiters for prospective students interested in engineering. DLC members are selected through an application process.

Diversity & Inclusion

The Gallogly College of Engineering Diversity and Inclusion office facilitates the outreach, recruitment, retention and overall success of underrepresented students. The office's programs provide the college with academic and professional support through a Freshman orientation course, tutoring, career and employment assistance, scholarships, OK-LSAMP STEM and Bridge to Doctorate Programs, the AT&T Summer Bridge Program, mentorship, alumni support, and more.

K-12 Outreach

Engineering faculty and students are actively engaged in promoting Science, Technology, Engineering, and Math (STEM) in K-12 education. The Gallogly College of Engineering offers a variety of programs to encourage kids to get excited about STEM education.

Career Guidance

The Gallogly College of Engineering hosts an annual Career Fair for students. All GCoE students are encouraged, if not required, to attend. Many companies commit to a regular presence on campus as speakers at student organizations' regular meetings or "Tech Talks." Additionally, GCoE students are provided information on career-related resources through their WSSC academic advisor and via the College's weekly electronic newsletter. Students are primarily encouraged to seek career advice through their faculty in the College's Academic Departmental offices. Faculty with past and/or current corporate collaborations are excellent resources for guidance, as are the College's alumni, many of whom welcome connecting with students regarding career advice. In the first-year Engineering Orientation course, and the second-year Professional Development course, students are also introduced to the career planning process, and the assistance available to them via the OU Career Services. These courses also introduce the students to undergraduate research experience (REU) programs and graduate school. The College also hosts a Graduate School Fair for the undergraduate students.

The OU Career Services offers specialized services to students and alumni, such as:

- Job search and interviewing skills
- Resume and cover letter writing
- Major specific career advice
- Internship and Job postings
- Information regarding Career Fairs, and on-campus interviews

Co-op Program

The Co-op Program offers a work-study experience that combines a sequence of academic study and engineering employment in industry or government. Participating in the Co-op Program allows the engineering student to gain first-hand experience in the application of academic studies to engineering problems.

Participation in the Co-op Program is optional and open to students enrolled full time in a degree program administered by the College of Engineering. Students who wish to participate in the Co-op Program must have completed all of the requirements of the first year of their degree program with a minimum 2.50 GPA. Students also must have the approval of the Director of the school of their major. Employment in a Co-op position requires the approval of the participating company. Interested students should apply as soon as possible during their first three semesters on campus.

The time required to complete an engineering degree program as a Co-op student will be longer than the usual eight-semester program. (Caution: Major courses in several CoE degree programs are sequential and offered only one time per year.) For further information and application forms contact the Gallogly College of Engineering, Williams Student Services Office (WSSC).

Internships

The Gallogly College of Engineering encourages all students to seek an internship either with College faculty assisting with research or with industry. Both the Williams Student Services Center (WSSC) and the OU Career Services office work to facilitate this process.

Work Experience

Students may request to receive credit for internship or co-op experiences. Specific faculty oversee such enrollments, and may require the student to provide a final project report and presentation. The faculty of the student's program determine if the credits may apply towards degree completion, and if so, if the credits will apply as a professional or technical elective in the student's program. For more information, contact Williams Student Services Center (WSSC).

Scholarships and Financial Aid Information

Future Students

Incoming students can learn more about scholarship opportunities through the Office of Admissions & Recruitment.

Current Students

Current students should review eligibility for scholarships through the OU Scholarship Office, which includes college- and department-level scholarship resources. All colleges and departments have combined their multiple departmental/ school scholarship applications into the Centralized Academic Scholarship Hub (OU CASH).

Financial Aid

The FAFSA (or Free Application for Federal Student Aid) is the government-provided application for need-based funds to help pay for college. OU highly recommends completing the FAFSA regardless of family's income. Nearly 75% of OU students who apply for financial aid receive some type of assistance.

Courses

- ENGR 1401 Dean's Leadership Council 1 Credit Hour**
Prerequisite: must have submitted an application and be approved by the college. This course is required of all DLC mentors and lead mentors. The purpose of the Dean's Leadership Council is to engage with new students pursuing a degree in the Gallogly College of Engineering. DLC mentors provide support to assist students with the transition to college life at OU, increase student involvement in the engineering community, and increase academic student success. (F, Sp)
- ENGR 1410 Freshman Engineering Orientation 0 Credit Hours**
Prerequisite: declared major in engineering. All entering freshmen with a declared engineering major are required to enroll. One hour of this seminar a week is in a large group setting where all students meet and cover details on all engineering disciplines. Additional topics would be continuums of majors, success in the College of Engineering, success at the University of Oklahoma, study abroad programs, advising issues, graduate school opportunities, career planning, and information related to technical/honor societies and participation. A second hour a week is a required small group session with an upper-class mentor from the College of Engineering Dean's Leadership Council. This second hour will focus on basic enrollment and retention strategies such as adding and dropping classes and choosing electives in addition to a weekly topic area. (F)
- ENGR 1411 Freshman Engineering Experience 1 Credit Hour**
Prerequisite: declared major in Engineering or permission of instructor. Required of all entering freshmen with a declared Engineering major. Lecture hours cover a variety of topics including: majors and minors; career planning; advising; and extra-curricular activities. Students also work on multi-disciplinary engineering projects in smaller groups during the lab hour. (F)
- ENGR 1510 Selected Topics 3 Credit Hours**
0 to 3 hours. Selected topics on current or special topics relating to engineering to be structured for students in engineering and other areas. (F, Sp, Su)
- ENGR 2002 Professional Development 2 Credit Hours**
Prerequisite: ENGR 1410 or ENGR 1411, or ENGR 3511 or ENGR 3410 or concurrent enrollment; ENGL 1213 or EXPO 1213, and sophomore standing. Develop an understanding of engineering ethics, teamwork, leadership, and professional responsibility through the concepts of contemporary, social, and global issues. (F, Sp)
- ENGR 2411 Applied Engineering Statics 1 Credit Hour**
Prerequisites: Physics 2514 and Mathematics 2433 or concurrent enrollment in Mathematics 2433. Review of fundamentals of statics calculations and their applications to common engineering situations. (Sp)
- ENGR 2431 Electrical Circuits 1 Credit Hour**
Prerequisite: MATH 2423 or 2924; and PHYS 2524 or concurrent enrollment. Introduction to basic principles of electrical circuits. Topics include DC circuits analysis, DC transients, static electrical fields, static magnetic fields, capacitors, inductors, and filters. (F, Sp)
- ENGR 2461 Thermodynamics 1 Credit Hour**
Prerequisite: MATH 2433 or 2934; and PHYS 2524 or concurrent enrollment. Introduction to basic principles of thermodynamics. Topics include density, pressure, and temperature, the first law of thermodynamics for a system, the first law of thermodynamics for a control volume, the second law of thermodynamics, and psychometrics. (F)
- ENGR 2531 Electrical Circuits II 1 Credit Hour**
Prerequisite: ENGR 2431. Introduction to intermediate principles of electrical circuits. Topics include amplifiers, filters, signal conditioning, A/D and D/A conversion, and common digital and analog circuits. (Sp)
- ENGR 2970 Special Topics/Seminar 1-3 Credit Hours**
1 to 3 hours. Prerequisite: Permission of instructor. May be repeated; maximum credit nine hours. Special topics or seminar course for content not currently offered in regularly scheduled courses. May include library and/or laboratory research and field projects. (Irreg.)
- ENGR 3401 Engineering Economics 1 Credit Hour**
Prerequisite: MATH 1823 or 1914 and CEES 2153 or PE 2153 or AME 2153. Introduction to basic principles of engineering economics. Topics include value and interest, cash flow diagrams and patterns, equivalence of cash flow patterns, unusual cash flows and interest periods, evaluating alternatives (annual equivalent cost comparisons, present equivalent cost comparisons, incremental approach, rate of return comparisons, benefit/cost comparisons, MARR, replacement problems, always ignore the past, break-even analysis), income tax, depreciation, and inflation. (F, Sp)
- ENGR 3410 Engineering Orientation for Transfer Students 0 Credit Hours**
Prerequisite: transfer students majoring in Civil Engineering, Environmental Science, Environmental Engineering, or Architectural Engineering majors. Sophomore standing or above. Required orientation course for majors in the School of Civil Engineering and Environmental Science. The lecture hours cover a variety of topics including: major and minors; career planning; advising; and extra-curricular activities. Students also work on multidisciplinary engineering projects. To be taken during the first semester of enrollment in the College of Engineering at OU. (F, Sp)
- ENGR 3431 Electromechanical Systems 1 Credit Hour**
Prerequisite: ENGR 2431. Introduction to basic principles of electromechanical systems. Topics include physical principles of sensing and actuation, types of sensors and actuators, and interfacing and communication protocols. (F, Sp)
- ENGR 3440 Mentored Research Experience 3 Credit Hours**
0 to 3 hours. Prerequisites: ENGL 1113 or equivalent, and permission of instructor. May be repeated; maximum credit 12 hours. For the inquisitive student to apply the scholarly processes of the discipline to a research or creative project under the mentorship of a faculty member. Student and instructor should complete an Undergraduate Research & Creative Projects (URCP) Mentoring Agreement and file it with the URCP office. Not for honors credit. (F, Sp, Su)
- ENGR 3441 Fluid Mechanics 1 Credit Hour**
Prerequisite: Mathematics 2433 or 2934; and Physics 2524 or concurrent enrollment. Introduction to basic principles of fluid mechanics. Topics include fluid properties, fluid statics, dimensionless parameters and similitude, control volume equations, open channel flow, and external flow. (Sp)
- ENGR 3510 Selected Topics 3 Credit Hours**
0 to 3 hours. Prerequisite: upper-division standing. Selected topics on current or special topics relating to the field of engineering. (F, Sp, Su)

- ENGR 3511 Engineering Orientation Experience for Transfer Students 1 Credit Hour**
Prerequisite: sophomore standing. Required of all incoming transfer students with a declared major in Engineering. The lecture hours cover a variety of topics including: majors and minors; career planning; advising; and extra-curricular activities. Students also meet with mentors and work on multidisciplinary engineering projects. Also open to students with an interest in engineering. (F, Sp)
- ENGR 3960 Honors Reading 1-3 Credit Hours**
1 to 3 hours. Prerequisite: admission to Honors Program. May be repeated; maximum credit six hours. Consists of topics designated by the instructor in keeping with the student's major program. Cover materials not usually presented in the regular courses. (Sp)
- ENGR 3970 Honors Seminar 1-3 Credit Hours**
1 to 3 hours. Prerequisite: admission to Honors Program. May be repeated; maximum credit six hours. Projects covered will vary. Deal with concepts not usually presented in regular coursework. (Irreg.)
- ENGR 3980 Honors Research 1-3 Credit Hours**
1 to 3 hours. Prerequisite: admission to Honors Program. May be repeated; maximum credit six hours. Provides an opportunity for the gifted Honors candidate to work on a special project in the student's field. (F, Sp, Su)
- ENGR 3990 Independent Study 1-3 Credit Hours**
1 to 3 hours. Prerequisite: permission of instructor and junior standing. May be repeated once with change of content. Independent study may be arranged to study a subject not available through regular course offerings. (F, Sp, Su)
- ENGR 4003 Engineering Practice 3 Credit Hours**
Prerequisites: ENGR 2002 or 2003, junior or senior standing, and permission of the instructor. Focuses on real world application of the skills taught in major courses and the core course, professional development. Allows a student to earn credit toward degree requirements through the completion of an intense internship experience. A written report detailing the responsibilities and results of the experience is required upon completion along with an oral presentation. Other service experience learning may qualify. (F, Su)
- ENGR G4013 Leadership and Management for Engineers 3 Credit Hours**
Prerequisites: junior standing or senior standing; or graduate standing; or instructor permission. This course will help prepare students for leadership and management positions in a global culture. The course emphasizes team building attributes in a multi-cultural organization, how to build commitment among team members, and how to organize to compete in the global marketplace. Students will gain a better understanding of themselves and their personal and professional goals. (F, Sp)
- ENGR G4023 Disruptive and Innovative Technology Ideation 3 Credit Hours**
Prerequisites: sophomore standing, junior standing, or senior standing; or graduate standing; at least one semester of calculus, a working knowledge of basic statistics, and departmental permission. Ideation is the process of conceiving or forming ideas. In the context of this class, the process of ideation will be investigated with regard to both disruptive and innovative commercial technologies. (F, Su)
- ENGR 4051 Lincoln, Leadership & Innovation 1 Credit Hour**
Prerequisite: Junior standing or instructor permission. Students will learn from the example of Lincoln's leadership, his ability to be innovative and employ technology-driven solutions, and his methods of personal and professional development. Students will reflect on and develop their own personal leadership philosophy in response to Lincoln's example. The course will provide students the opportunity to delve into an area of Lincoln's leadership of personal interest. (Sp)
- ENGR 4113 Science, Engineering, and Mathematics Educational Outreach for STEM Majors 3 Credit Hours**
(Slashlisted with 5113) Prerequisite: junior or senior standing and permission of instructor. Designed for STEM majors interested in educational outreach at any age level, this course introduces the fundamentals of cognition, educational psychology and pedagogy, and shows how these topics relate to learning. Critical review and analysis of STEM education in light of best teaching practices, school cultural issues, gender issues, and ethnic cultural issues will be explored. Authentic, inquiry-based STEM lessons will be developed and taught in K-12 classrooms or similar education venues. Field site observations and interactions with educational professionals will be used to emphasize practical application of learning theory. No student may earn credit for both 4113 and 5113. (F)
- ENGR G4510 Selected Topics 1-6 Credit Hours**
1 to 6 hours. Prerequisite: upper-division or graduate standing. Selected topics on current or special topics relating to engineering. May be structured for students in other areas. (Sp)
- ENGR G4513 Introduction to Sustainable Engineering 3 Credit Hours**
Prerequisite: upper-division or graduate standing in the College of Engineering or permission of the instructor. An introduction to the concepts of sustainable development, sustainable engineering, global resource reserves, and global environmental concerns. The main focus of the class will be application of life cycle assessment to minimize the adverse environmental impacts of products (e.g., a pencil) or processes (e.g., wastewater treatment). Tools for life cycle assessment will include public domain software and SimaPro. (Sp)
- ENGR 4960 Directed Readings 1-4 Credit Hours**
1 to 4 hours. Prerequisite: good standing in University; permission of instructor and dean. May be repeated; maximum credit four hours. Designed for upper-division students who need opportunity to study a specific problem in greater depth than formal course content permits. (Irreg.)
- ENGR 4970 Special Topics/Seminar 1-3 Credit Hours**
1 to 3 hours. Prerequisite: Senior standing or permission of instructor. May be repeated; maximum credit nine hours. Special topics or seminar course for content not currently offered in regularly scheduled courses. May include library and/or laboratory research and field projects. (Irreg.)
- ENGR 4990 Independent Study 1-3 Credit Hours**
1 to 3 hours. Prerequisite: Senior standing and permission of instructor. May be repeated; maximum credit nine hours. Contracted independent study for a topic not currently offered in regularly scheduled courses. Independent study may include library and/or laboratory research and field projects. (Irreg.)

ENGR 5113 Science, Engineering and Mathematics Educational Outreach for STEM Majors 3 Credit Hours

(Slashlisted with 4113) Prerequisite: graduate standing and permission of instructor. Designed for STEM majors interested in educational outreach at any age level, this course introduces the fundamentals of cognition, educational psychology and pedagogy, and shows how these topics relate to learning. Critical review and analysis of STEM education in light of best teaching practices, school cultural issues, gender issues, and ethnic cultural issues will be explored. Authentic, inquiry-based STEM lessons will be developed and taught in K-12 classrooms or similar education venues. Field site observations and interactions with educational professionals will be used to emphasize practical application of learning theory. No student may earn credit for both 4113 and 5113. (F)

ENGR 5120 Engineering Education Enquiry 1-3 Credit Hours

1 to 3 hours. Prerequisite: Graduate standing or permission of instructor. May be repeated; maximum credit nine hours. Seminar course covering topics in engineering education research. (Irreg.)

ENGR 5900 Engineering Professional Practice 1-6 Credit Hours

1-6 hours. Prerequisite: Graduate standing and departmental permission. May be repeated; maximum credit six hours. Participation in a professional experience with an approved project sponsor and topic. A written report detailing the responsibilities and results of the experience is required upon completion along with an oral presentation. (F, Sp, Su)

ENGR 5960 Directed Readings 1-3 Credit Hours

1 to 3 hours. Prerequisite: graduate standing and permission of department. May be repeated; maximum credit twelve hours. Directed readings and/or literature reviews under the direction of a faculty member. (F, Sp, Su)

ENGR 5970 Special Topics/Seminar 1-3 Credit Hours

1 to 3 hours. Prerequisite: Graduate standing or permission of instructor. May be repeated; maximum credit nine hours. Special topics or seminar course for content not currently offered in regularly scheduled courses. May include library and/or laboratory research and field projects. (Irreg.)

ENGR 5980 Research for Master's Thesis 2-9 Credit Hours

Variable enrollment, two to nine hours; maximum credit applicable toward degree, four hours. (F, Sp, Su)

ENGR 5990 Independent Study 1-3 Credit Hours

1 to 3 hours. Prerequisite: Graduate standing and permission of instructor. May be repeated; maximum credit nine hours. Contracted independent study for a topic not currently offered in regularly scheduled courses. Independent study may include library and/or laboratory research and field projects. (Irreg.)

ENGR 6960 Directed Readings 1-3 Credit Hours

1 to 3 hours. Prerequisite: graduate standing or permission of instructor. May be repeated; maximum credit six hours. Directed readings and/or literature review under the direction of a faculty member. (Irreg.)

ENGR 6970 Special Topics/Seminar 1-3 Credit Hours

1 to 3 hours. Prerequisite: graduate standing or permission of instructor. May be repeated; maximum credit 12 hours. Special topics or seminar course for content not currently offered in regularly scheduled courses. May include library and/or research and field projects. (Irreg.)

ENGR 6980 Research for Doctoral Dissertation 2-16 Credit Hours

(F, Sp, Su)

ENGR 6990 Independent Study 1-3 Credit Hours

1 to 3 hours. Prerequisite: Graduate standing and permission of instructor. May be repeated; maximum credit nine hours. Contracted independent study for a topic not currently offered in regularly scheduled courses. Independent study may include library and/or laboratory research and field projects. (Irreg.)