COLLEGE OF ENGINEERING, ARCHITECTURE AND TECHNOLOGY

College Administration

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The vision of the College of Engineering, Architecture and Technology (CEAT) is "To be the leading public university in engineering, architecture, and technology that engages diverse students, faculty and staff with industry and government to deliver excellence in advanced learning, leadership, relevant research, and benefits to society."

"Our mission is to provide a diverse population with a quality education in engineering, architecture and technology. Through CEAT, OSU develops ethical leaders who promote economic and community vitality with technical knowledge, innovation, and communication expertise that connects scientific research, professional education, technical assistance and scholarship to industry, the State of Oklahoma, the nation and the world."

The College of Engineering, Architecture and Technology is a community of scholars, innovators and leaders that is transforming our lives. The preparation of professionals that anticipate the needs of a changing world is at the nexus of society, economy, ethics, sustainability and humanity. The College is committed to training professionals that innovate, design and build projects that provide solutions for both the developed and the developing world.

The mission of the College of Engineering, Architecture and Technology (CEAT) is one that embraces students from diverse backgrounds to imagine and discover the challenges of engineering, architecture and technology, and to bring about innovation using their proficiency in science, mathematics, communications, ethics and humanity. This mission is built on the foundation of the University's mission and the expectations of a world class university.

As Oklahoma's land-grant university, CEAT fulfills the most fundamental premise that founded OSU; to promote economic and community viability through technical assistance, academic and professional education, training and communication in the areas of engineering, architecture and technology, and by connecting scientific research and scholarship to industry, communities, and individual citizens in Oklahoma, the region and the world.

As we progress into the future, professionals with a higher education will continue to be largely responsible for shaping our world. The power they exercise is an exciting prospect and presents a sobering responsibility. Less complex problems have been solved and are now a part of history. Many difficult problems remain. The need for talented and highly trained professionals is obvious; one will be embarking on a lifetime of challenge as he or she prepares for a career in engineering, engineering technology or architecture at Oklahoma State University.

The College of Engineering, Architecture and Technology offers a complete spectrum of educational opportunities at both the undergraduate and graduate levels designed to give graduates the capability and flexibility to meet the ever-changing needs of a society that is committed to technological innovation. To make continuing contributions, engineers, architects and technologists must have many abilities at their command. The modern tools and processes of industry must be understood. The processes of design and analysis require a firm understanding of mathematics and the sciences. An effective engineer, architect or engineering technologist must develop sensitivity to human needs, ideas, institutions and cultures. These programs prepare graduates to be effective contributors within human organizations and provide an increased understanding of both the technical and non-technical factors that shape our human environment. With this firm foundation, and a commitment to lifelong learning, College of Engineering, Architecture and Technology graduates are fully prepared to make contributions to society throughout their professional careers.

The curriculum in each program provides the optimum combination of breadth in the enduring fundamentals and specialization in a discipline. Each curriculum sensitizes the student to ethical, social, cultural, and global issues that will shape their ideas and contributions. To equip the student to contribute to solutions at the cutting edge of technology, curricula are continuously evolving to include current applications of the principles. Through the combination of theory, practice and improved sensitivity to diverse issues, graduates will be prepared to support their diverse interests while positively contributing to the advancement of technology and the world.

Academic Programs

Academic programs offered in the College of Engineering, Architecture and Technology culminate in the following degrees:

Schools of Engineering

Bachelor of Science in Aerospace Engineering, Biosystems Engineering with options in bioprocessing and food processing, environment and natural resources, machine systems and agricultural engineering, and premedical; Chemical Engineering with options in biomedical/ biochemical and premedical; Civil Engineering with an option in environmental; Computer Engineering; Electrical Engineering; Industrial Engineering and Management; and Mechanical Engineering with options in premedical.

Master of Science in Biosystems Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering with options in Control Systems and Optics and Photonics, Engineering and Technology Management, Environmental Engineering, Industrial Engineering and Management, Materials Science and Engineering, Mechanical and Aerospace Engineering with an option of Unmanned Aerial Systems and Petroleum engineering.

Doctor of Philosophy in Biosystems Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering and

Management, Materials Science and Engineering, and Mechanical and Aerospace Engineering.

School of Architecture

Bachelor of Architecture, Bachelor of Architectural Engineering.

Division of Engineering Technology

Bachelor of Science in Engineering Technology in Construction Management Technology with options in building and heavy, Electrical Engineering Technology with a computer option, Fire Protection and Safety Engineering Technology, and Mechanical Engineering Technology.

Accreditation

Undergraduate engineering programs are separately accredited by the Engineering Accreditation Commission of the ABET, http://www.abet.org.

The Bachelor of Architecture program is accredited by the National Architectural Accrediting Board, Inc., http://www.naab.org/

The undergraduate engineering technology programs are separately accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org.

High School Preparation

In addition to the curricular requirements for admission specified by OSU, the College of Engineering, Architecture and Technology strongly recommends that students have a fourth year of mathematics and an additional year of laboratory science.

Initial placement in OSU mathematics courses is by placement examination to ensure that each student will be challenged, but has the preparation to be successful in the first mathematics course. Placement in science courses is based on prior preparation in the science and completion of or placement beyond prerequisite mathematics courses. When appropriate, a student with an exceptionally strong background can obtain academic credit by advanced standing examination or by College Level Examination Program (CLEP) tests.

Enrolling in the College of Engineering, Architecture, and Technology (effective fall 2018)

A freshman student who has been admitted to OSU can be enrolled directly into a CEAT pre-professional degree program if the student has both of the following performance requirements:

1. an ACT Composite score of 24 or higher, or a total SAT score of 1090 or higher, or a SAT R score of 1160 or higher, and
2. an ACT MATH score of 24 or higher, or a SAT Math score of 560 or higher, or a SAT-R Math score of 600 or higher, OR achieve a GPA of 3.5 or higher (on a 4.00 grading scale standard weighting (1.0) to The College Board's Advanced Placement courses and the International Baccalaureate higher-level courses) in the required 15 core high school courses.

SAT total score is the combination of Critical Reading and Math sections only. SAT-R scores indicated here represent tests taken on or after the National March 2016 test.

Prospective engineering, architecture, or technology students who do not meet these performance qualifications may enroll in any other college or may enroll in University College in the Pre-CEAT program and work with a CEAT-focused advisor to gain the academic background for enrollment in CEAT pre-professional degree programs. That student will be enrolled in a CEAT pre-professional degree program when he/she has met the following performance requirements:

1. passed all prerequisite MATH courses needed to enroll in Calculus I or Technology Calculus I, and
2. has an OSU Cumulative GPA of at least 2.5.

Transfer students can enroll directly into a CEAT pre-professional degree program if they satisfy all OSU resident transfer student requirements, have a GPA of at least 2.5, and are qualified to enroll in Calculus I or higher in the MATH sequence. Other transfer students may enroll in University College in the Pre-CEAT program until they meet the qualifications for enrolling in a CEAT pre-professional program.

Students transferring to CEAT pre-professional school from another major at OSU must meet the same requirements for admission as a student transferring from another college or university.

International student applications must be received by June 15, November 1 or April 1 for the fall, spring and summer terms, respectively, to be considered for admission to pre-professional school.

Special College Programs

CEAT Living/ Learning Program. CEAT residential floors have been established in Parker Hall and Allen Hall for both male and female CEAT students. Parker Hall is reserved for CEAT Freshman and Allen Hall is reserved for CEAT sophomores and upperclassmen. Living/ Learning Programs provide an atmosphere that is conducive to study. The students experience a community where they can work together, have access to tutoring and other services, and serve as role models for other students. Special activities are planned for the floors, including events with faculty and other leaders. They are highly recommended for student success in CEAT.

CEAT Summer Bridge is a two-week residential, on campus, preparatory program for incoming freshmen students who have been accepted to Oklahoma State University and who plan to study a major in CEAT. This program is designed to guide students as they transition from high school to the academic rigors of CEAT coursework through academic review, mock exams, orientation seminars and engineering design projects. In addition, the students will build relationships with peers, faculty and staff, and start the process of building strong study habits with the assistance of CEAT upperclassmen as mentors. https://studentservices.okstate.edu/summer-bridge-program.

The **Discover Architecture Program** introduces high school students to Architecture, Architectural Engineering, Landscape Architecture, and Construction Science and Management. This week-long summer program has academic projects that are designed to stimulate creativity and be fun! Participants live in campus housing, and complete projects that include the application of sketching and designing in model, using computer presentation tools, and several hands-on building projects to help students understand if a career in the building arts might be right for them. The program is offered by Oklahoma State University faculty, at the Stillwater campus, for students who are at least 16 years of age. http://arch-ceat.okstate.edu/discover-architecture.

The **Pre-CEAT Program** is housed within University College but located in CEAT. This program provides a focused advisor, tutoring, and other activities to help students get academically ready for success in CEAT.

CEAT Scholars Program provides educational experiences for a select group of gifted students to develop and enhance their technical

competence, world view, professional and public responsibility, and leadership skills. Based on demonstrated academic and leadership potential, approximately 25 freshmen are selected each year, by application and interview, to enter this four-year program. Students participate in special lectures, regional tours, residence hall programs, seminars, personal development activities, faculty mentoring, and summer tours in the U.S. and abroad. https://ceat.okstate.edu/ceat-scholars-program

CEAT Freshman Research Scholars Program provides opportunities for accelerated intellectual development of a select group of students. Each student is assigned a research faculty mentor and participates in a research program. The initial assignment is for one year and it may be extended based on student interest, research project continuation and mentor availability. https://scholardevelopment.okstate.edu/freshman-research-scholars/prospective-freshman-researchers.

WW Allen Scholars Program is designed for top academic students, who also show significant promise in leadership and career ambition. The program is highlighted by the opportunity to pursue a master's degree at the University of Cambridge in the UK following graduation from OSU. Details at http://ceat.okstate.edu/w-w-allen-scholars-program.

Phillips 66 SHIELD Scholars Program provides scholarships and professional and personal development through enrichment activities, seminars and community service. The program is for current students enrolled full-time in chemical engineering, civil engineering, computer engineering, electrical engineering, fire protection safety technology, industrial engineering, mechanical engineering or materials engineering. http://ceat.okstate.edu/scholarships.

CEAT Grand Challenge Scholars Programs focus on preparing students to be the generation that solves the grand challenges facing society in this century with emphasis on integrative research, interdisciplinary curriculums, entrepreneurship, global understanding and service learning. https://ceat.okstate.edu/gcsp

CEAT Diversity Programs (CDP) provide services to support, retain and graduate all CEAT students which includes underrepresented populations such as Native Americans, African Americans, Hispanic/Latino Americans, Women, First-Generation, Non-Traditional, Disabled, Veterans, and LGBTQ. All students are welcome to participate, learn and celebrate the value of a diverse CEAT community. https://studentservices.okstate.edu/diversity.

CEAT Career Services is dedicated to helping students reach their career goals by providing individualized career assistance, specialized workshops, and resources on a variety of topics including: career exploration, job search strategies, resume and job search correspondence preparation, interviewing skills, and salary negotiation. The office also supports the Cooperative Education Program (Co-op) and provides individual career assessments for undergraduate students. As part of the OSU Career Services system, CEAT Career Services works in close partnership with CEAT Student Academic Services to link academic and career success http//studentservices.okstate.edu/career (http://studentservices.okstate.edu/career).

CEAT Cooperative Education Program (Co-op) provides an avenue for undergraduate students to complete a year of full-time work experience directly related to their academic studies. Co-op students alternate terms of major-related employment with terms of full-time course work to achieve a quality education and industry experience. In addition to professional development, participation in the Co-op program earns academic credit and maintains full-time enrollment status for students during the work experience terms. http://studentservices.okstate.edu/cs/co-op.

CEAT Study Abroad Programs offer students the opportunity to expand their education by traveling and studying outside the United States. Opportunities range from shorter faculty-led programs to semester exchange opportunities.

Departmental Clubs and Honor Societies

Alpha Epsilon (Biosystems and Agricultural Engineering Honor Society)
Alpha Omega Epsilon (Professional and Social Sorority for Women in Engineering
Alpha Pi Mu (Industrial Engineering and Management Honor Society)
Alpha Rho Chi (Architecture Honor Society)
Amateur Radio Club - W5YJ
American Association of Drilling Engineers
American Indian Science and Engineering Society
American Institute of Architecture Students
American Institute of Aeronautics & Astronautics
American Institute of Chemical Engineers
American Production and Inventory Control Society
American Society for Quality
American Society of Agricultural and Biological Engineers
American Society of Civil Engineers
American Society of Heating, Refrigeration and Air Conditioning Engineers
American Society of Mechanical Engineers
American Society of Safety Engineers
Architectural Engineering Institute
Architecture Students Teaching Elementary Kids (ASTEK)
CEAT Student Council
CHEM Kidz
Chi Epsilon (Civil and Architectural Engineering Honor Society)
Construction Management Society
Construction Specifications Institute
Cowboy Motorsports Quarter Scale Tractor Team
Engineers Without Borders
Eta Kappa Nu (Electrical and Computer Engineering Honor Society)
Fire Protection Society
Institute for Operations Research and the Management Sciences
Institute of Electrical and Electronics Engineers (two student branches)
Institute of Industrial and Systems Engineers
Institute of Transportation Engineers
International Fluid Power Society
International Society for Automation
Omega Chi Epsilon (Chemical Engineering Honor Society)
Pi Tau Sigma (Honorary Mechanical Engineering Society)
Sigma Gamma Tau (Honorary Aerospace Engineering Society)
Sigma Lambda Chi (Construction Management Technology Honor Society)
Society of Automotive Engineers
Society of Automotive Engineers Formula Racing Team
Society of Automotive Engineers Mini-Baja Team
Society of Black Engineers, Technologists & Architects
Society of Fire Protection Engineers
Society of Hispanic Professional Engineers
Society of Petroleum Engineers
Society of Manufacturing Engineers
Society of Women Engineers
Student Association of Fire Investigators
Student Firefighter Combat Challenge Team

Tau Alpha Pi (Technology Student's Honor Society)
Tau Beta Pi (Engineering Student's Honor Society)

CEAT Honors Program

The OSU Honors College provides challenges for undergraduate students of unusually high ability, motivation and initiative. Honors classes, seminars and independent study courses are designed to align students and instructors in a manner that encourages discussion and provides a mature approach to learning.

Each honors course completed with an "A" or "B" grade is identified on the student's transcript as such. A special bachelor's degree honors diploma is conferred upon graduation for successful completion of all OSU Honors College requirements.

Information regarding The Honors College at OSU, and Scholar Development/Leadership Programs can be found on the Honors College tab in the left menu.

Scholarships

Numerous CEAT scholarships are funded through the generosity of alumni, private, and corporate donations. Awards are available for undergraduate students at all levels, and are granted on the basis of academic achievement, campus involvement and leadership potential, as well as financial need. Freshmen and undergraduate transfer students are automatically considered for most CEAT scholarships, based off of the student's eligibility through their application and acceptance to OSU and CEAT, accepted by February 1st for priority scholarship consideration, students should apply and be accepted to CEAT by November 1st. All CEAT scholarships are awarded on a competitive basis. Some scholarships require additional applications. Details can be found at http://ceat.okstate.edu/scholarships. Current undergraduate (continuing) students should submit applications for general CEAT scholarships online at http://ceat.okstate.edu/scholarships. Students should also check with their individual departments for information regarding scholarships specific to their majors.

Computing Requirements
For students in Engineering, Architecture and Technology, the college requires that all students have several basic tools. Students in the College must have a scientific calculator and a laptop computer. The scientific calculator should be capable of computing trigonometric functions, logarithmic and natural logarithmic functions, basic statistical analysis, and all algebraic functions. The laptop requirements are published at http://ceat-its.okstate.edu**.**

Academic Advising
The College's Office of Student Academic Services (http://studentservices.okstate.edu/) provides advisement for all CEAT freshman students except for BAE students who are advised in their academic department. Other CEAT students will transfer to advisement within their academic unit prior to or at admission to Professional School. University College provides advisement for OSU students who do not meet the qualifications for enrollment in CEAT but wish to become qualified to enroll in a CEAT degree program in the future. Each student is personally advised in the planning and scheduling of his or her course work, assisted with the selection of a major, and is counseled and advised individually on matters of career choice, activities at OSU, and on other academic matters.

Each CEAT student, and his or her adviser, carefully selects general education, core engineering or architecture, and elective courses to meet the curriculum objectives and accreditation criteria. To assist students in planning and mapping their academic success, an electronic account is created for each student at the time of initial enrollment. Students have access to their personal account, via the STAR System, where they can review their advising materials, degree sheet, flowchart and other documents. The adviser assists the student with academic decisions and works to ensure accuracy and compliance; however, the ultimate responsibility for meeting degree requirements rests with the student.

The College of Engineering, Architecture, and Technology Professional School Concept

Pre-Professional School. In each CEAT pre-professional degree program, lower-division course work is devoted to preparing the student for professional school. The content of the pre-professional school program is similar for most engineering degree programs and includes English composition and technical course work devoted to mathematics through calculus and differential equations, general chemistry, general physics, engineering and engineering sciences. Requirements vary for Architecture, and Technology degree programs.

Once a student is admitted into the pre-professional school program, he/she will complete course work that is typically taken during the first two years of an engineering, architecture, or technology curriculum. Near the completion of this course work, the student is considered for admission to one of the professional schools of the College to continue in the upper-division program. After satisfying admission standards, the student is then permitted to pursue a curriculum leading to the designated undergraduate degree in his/ her discipline.

Professional School. Upon formal admission to the professional school of his or her choice, the student proceeds through the junior and senior years of the degree program, fulfilling "Major Requirements" as listed in the right column on the degree requirement sheet. Degree requirement sheets can be found in the university's publication of *Undergraduate Programs and Requirements*, available online.

Engineering Professional School Admission Requirements

All undergraduate CEAT students must follow the curriculum and requirements for their chosen major, as prescribed in the university's publication of *Undergraduate Programs and Requirements*, for their matriculation date, or upon their election, a later annual version of that publication. Students are encouraged to carefully read the program requirements for their chosen major and matriculation date.

To be admitted to one of the professional schools of engineering, the student must:

1. Complete a minimum of 60 credit hours of courses listed on the degree requirement sheet from an accredited institution of higher learning.
2. Complete all required courses noted on the degree requirement sheet.
3. Earn a grade of "C" or better in technical courses required for the degree and taken prior to admission to professional school. In these courses, meet or exceed the **Technical GPA** requirement listed in the *Departmental GPA Requirements* section below (when applicable). Note: Technical courses include astronomy, biology, biochemistry, chemistry, geology, engineering (BAE, CHE, CIVE, IEM, ECEN, ENGR,

ENSC, MAE), math, physics, statistics, zoology, and any additional science courses listed on the degree requirement sheet.

4. Complete a minimum of 12 credit hours of courses at OSU, required for the degree. In these courses, meet or exceed the **OSU GPA** requirement listed in the *Departmental GPA Requirements* section below (when applicable).
5. Complete a minimum of 9 credit hours of technical courses at OSU, required for the degree. In these courses, meet or exceed the **OSU Technical GPA** (all technical courses required for the degree taken at OSU) listed in the *Departmental GPA Requirements* section below (when applicable).
6. Earn a final grade of "C" or better in all courses submitted to satisfy the University's English requirement.
7. Meet any additional requirements for the selected major, as specified below.
8. Demonstrate an acceptable level of academic competence in subject material comparable to that covered in pre-professional school as defined by the selected professional school below. Such demonstration may be by completion of course work or by examination with not more than half the requirements satisfied by examination.
9. Demonstrate an acceptable level of professional potential, including academic integrity and ethical behavior, as determined by the department head.

Departmental GPA Requirements

All specified GPAs are calculated based on the last grade earned in repeated courses. The minimum GPA requirements by school, and any additional requirements, are as follows:

1. School of Biosystems and Agricultural Engineering:
   GPA Requirements for Professional School: Technical GPA-2.70, OSU GPA-2.70, OSU Technical GPA-2.70 and a grade of "C" or better in each course that is a prerequisite for a major course.
2. School of Chemical Engineering:
   GPA Requirements for Professional School: Technical GPA-2.70, OSU GPA-2.50, OSU Technical GPA-2.70. A final grade of "C" or better must be achieved in the required pre-professional courses (noted on the degree requirement sheet). If a "C" is obtained in ENGL 1113 Composition I or ENGL 1313 Critical Analysis and Writing I, ENGL 1213 Composition II or ENGL 1413 Critical Analysis and Writing II is also required.
3. School of Civil and Environmental Engineering:
   GPA Requirements for Professional School: Technical GPA-2.70, OSU GPA-2.50, OSU Technical GPA-2.70, and a grade of "C" or better in each course that is a prerequisite for a CIVE course and in all required technical pre-professional courses (noted on the degree requirement sheet) whether taken prior to professional school or not. Students may enroll in no more than nine hours of professional school major requirements prior to admission to professional school unless they secure permission from the head of the school. However, enrollment preference in such courses will be given to students admitted to the professional school.
4. School of Electrical and Computer Engineering:
   GPA Requirements for Professional School: Technical GPA-2.70, OSU GPA-2.60, OSU Technical GPA-2.70.
5. School of Industrial Engineering and Management: GPA Requirements for Professional School: Technical GPA-2.50, and a grade of "C" or better in each course that is a prerequisite for an IEM course and in all technical pre-professional courses (noted on the degree requirement sheet) whether taken prior to professional school or not.
6. School of Mechanical and Aerospace Engineering: GPA Admission Requirements for Professional School: Technical GPA 3.0, OSU GPA 3.0, OSU Technical GPA-3.0.
   Admission and degree requirements: a grade of "C" or better in each course that is a prerequisite for an MAE course and in all technical pre-professional courses (noted on the degree requirement sheet) whether taken prior to professional school or not. Minimum GPA requirements for graduation: Overall GPA 2.50 GPA for MAE prefix courses-2.5 GPA for MAE 4000 level courses-2.5. Students may enroll in no more than nine hours of upper-division major requirements prior to admission to professional school unless they secure permission from the head of the school. However, enrollment preference in such courses will be given to students admitted to the professional school.

To be admitted to a degree program in the School of Architecture or Division of Technology:

see the requirements under School of Architecture or Division of Engineering Technology in the Department Areas above.

Academic Areas

- Biosystems and Agricultural Engineering (p. 1440)
- Chemical Engineering (p. 1450)
- Civil and Environmental Engineering (p. 1459)
- Construction Management Technology (p. 1465)
- Division of Engineering Technology (p. 1471)
- Electrical and Computer Engineering (p. 1472)
- Electrical Engineering Technology (p. 1479)
- Engineering Dean's office and CEAT Distance Education (p. 1483)
- Fire Protection and Safety Engineering Technology (p. 1485)
- Industrial Engineering and Management (p. 1492)
- Materials Science and Engineering (p. 1496)
- Mechanical and Aerospace Engineering (p. 1497)
- Mechanical Engineering Technology (p. 1506)
- School of Architecture (p. 1510)

Undergraduate Programs

- Aerospace Engineering, BSAE (p. 1500)
- Architectural Engineering: Construction Project Management, BEN (p. 1515)
- Architectural Engineering: Mechanical, Electrical and Plumbing, BEN (p. 1517)
- Architecture Engineering: Structures, BEN (p. 1521)
- Architecture, BAR (p. 1523)
- Biosystems Engineering: Bioprocessing & Food Processing, BSBE (p. 1442)
- Biosystems Engineering: Environmental and Natural Resources, BSBE (p. 1444)
- Biosystems Engineering: Machine Systems & Agricultural Engineering, BSBE (p. 1446)
- Biosystems Engineering: Pre-Medical, BSBE (p. 1448)
- Chemical Engineering, BSCH (p. 1452)
- Chemical Engineering: Biomedical/Biochemical, BS (p. 1454)
- Chemical Engineering: Pre-Medical, BSCH (p. 1456)

- Civil Engineering, BSCV (p. 1461)
- Civil Engineering: Environmental, BSCV (p. 1463)
- Computer Engineering, BSCP (p. 1475)
- Construction Management Technology: Building, BSET (p. 1467)
- Construction Management Technology: Heavy, BSET (p. 1469)
- Electrical Engineering Technology, BSET (p. 1481)
- Electrical Engineering Technology: Computer, BSET (p. 1482)
- Electrical Engineering, BSEE (p. 1477)
- Fire Protection and Safety Engineering Technology, BSET (p. 1487)
- Industrial Engineering and Management, BSIE (p. 1494)
- Mechanical Engineering Technology, BSET (p. 1508)
- Mechanical Engineering, BSME (p. 1502)
- Mechanical Engineering: Pre-Medical, BSME (p. 1504)

Minors

Undergraduate Minors

Contact the following individuals for information on areas of concentration:

Engineering

Professor Randy Seitsinger, randy.seitsinger@okstate.edu, 201 ATRC, 744-5140

Architecture

Professor Suzanne Bilbeisi, suzanne.bilbeisi@okstate.edu, 101AK Donald W Reynolds Bldg, 744-9051

Fire Protection & Safety Technology

Dr. Qingsheng Wang, qingsheng.wang@okstate.edu, 499 Cordell South, 744-2673

- Architectural Studies: Architecture and Entrepreneurship (ASAE), Minor (p. 1519)
- Architectural Studies: History and Theory (ASHT), Minor (p. 1520)
- Fire Suppression and Emergency Operations (FSEO), Minor (p. 1489)
- Homeland Security Science and Technology (HSST), Minor (p. 1490)
- Nuclear Engineering (NENG), Minor (p. 1484)
- Petroleum Engineering (PETE), Minor (p. 1458)
- Safety and Exposure Sciences (SAES), Minor (p. 1491)

Graduate Programs

- Biosystems Engineering, MS/PhD (p. 1440)
- Chemical Engineering, MS/PhD (p. 1451)
- Civil Engineering, MS/PhD (p. 1459)
- Electrical Engineering, MS/PhD (p. 1473)
- Control Systems, MS (p. 1473)
- Optics and Photonics, MS (p. 1473)
- Engineering and Technology Management, MS (p. 1473)
- Fire Safety and Explosion Protection, MS (p. 1485)
- Environmental Engineering, MS (p. 1459)
- Industrial Engineering and Management, MS/PhD (p. 1493)
- Materials Science and Engineering, MS/PhD (p. 1496)
- Mechanical and Aerospace Engineering, MS/PhD (p. 1498)
- Unmanned Aerial Systems, MS/PhD (p. 1498)
- Petroleum Engineering, MS (p. 1434)

Biosystems and Agricultural Engineering

The School of Biosystems and Agricultural Engineering is administered jointly by the College of Agricultural Sciences and Natural Resources and the College of Engineering, Architecture and Technology.

Biosystems engineers are professionals who create and adapt engineering knowledge and technologies for the efficient and effective production, processing, storage, handling and distribution of food, feed, fiber and other biological products, while at the same time providing for a quality environment and preserving and protecting natural resources. Biosystems engineers directly address problems and opportunities related to food, water, energy, and the environment – all of which are critical to the quality of life in our society. Subject-matter specialization is provided through the following three undergraduate option areas: bioprocessing and food processing, environment and natural resources and biomechanical.

Biosystems engineering courses integrate engineering sciences, physical sciences, and biological sciences, and teach students to address real-world challenges. With the guidance of experienced faculty, students work both as individuals and in teams to design creative solutions to complex problems.

The overall objective of the undergraduate biosystems engineering degree program is to provide the comprehensive education necessary to prepare students for successful, productive and rewarding careers in engineering for agricultural, food and biological systems.

Within a few years of graduation, Biosystems Engineering program graduates will become top professionals, managers or leaders in a wide variety of industries and organizations involved with biosystems engineering, where they apply discovery, problem solving, and leadership skills for the benefit of their organization and the society at large.

The undergraduate educational program is divided into two components —pre-professional and professional. In the pre-professional portion of the biosystems engineering program (usually equivalent to two years of study) the focus is on the underlying biological, physical, chemical and mathematical principles of engineering, supplemented by appropriate general education courses in English, social sciences and humanities.

Students who demonstrate proficiency in this portion of the program are eligible for admission to the professional school in biosystems engineering.

The professional school portion of the biosystems engineering curriculum (typically two years) builds systematically upon the scientific knowledge acquired in the pre-professional curriculum. In professional school, students have the opportunity to focus on the option areas listed above. The degree is accredited by the Engineering Accreditation Commission of ABET (see www.abet.org (http://www.abet.org)) under criteria for biological engineering and similarly named programs.

Each professional school course builds upon preceding engineering courses to develop in the student the ability to identify and solve meaningful engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The course work incorporates the social and economic aspects of technical problems, and stresses the responsibilities of engineering professionals to behave ethically and promote occupational and public safety. The program culminates in senior year design courses in which students integrate the analysis, synthesis and other abilities they have developed throughout the earlier portions of their study into a capstone experience. At this point, students are able to design components, systems and processes that meet specific requirements, including such pertinent societal considerations as ethics, safety, environmental impact and aesthetics. The students have also developed and displayed the ability to conduct experiments essential to specific studies and to analyze the experimental results that lead to meaningful conclusions.

The biosystems engineering program verifies that our students possess core engineering knowledge and capability by requiring students to take the Fundamentals of Engineering exam, which is an important step toward becoming a professional engineer. All candidates for the BS degree in biosystems engineering must take the Fundamentals of Engineering exam prior to receiving their degree.

An integral part of this education continuum, from basic science through comprehensive engineering design, are learning experiences that facilitate the students' abilities to function effectively in both individual and team environments. To achieve this, the program provides every graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and utilized as a part of their problem-solving experiences. Finally, the students' experience in solving ever-more-challenging problems enables them to continue to learn independently throughout their professional careers.

A wide variety of employment opportunities are available for biosystems engineers in industry, public service and education. Some of these opportunities include positions in governmental agencies, consulting engineering firms, and agricultural and food equipment industries. Biosystems engineers are employed throughout the U.S. as well as internationally.

Students interested in a degree in biosystems engineering may initially enroll in the College of Engineering, Architecture and Technology or the College of Agricultural Sciences and Natural Resources. Through either college, they will be assigned a Biosystems engineering advisor.

Undergraduate Programs

- Biosystems Engineering: Bioprocessing & Food Processing, BSBE (p. 1442)
- Biosystems Engineering: Environmental and Natural Resources, BSBE (p. 1444)
- Biosystems Engineering: Machine Systems & Agricultural Engineering, BSBE (p. 1446)
- Biosystems Engineering: Pre-Medical, BSBE (p. 1448)

Graduate Programs

The Department of Biosystems and Agricultural Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees in biosystems engineering. These degrees emphasize research and development.

Excellent laboratory and computer facilities are available for students to explore research and design in such areas as bioprocessing, food engineering, sensor and control technology, waste management and utilization, hydrology, water quality, porous media flow, and intelligent systems for agricultural machine design and production.

Research projects are supported by the Oklahoma Agricultural Experiment Station and by state, federal and private grants and contracts. Well-trained faculty members, many of whom are registered professional engineers with research, consulting and design experience, guide the graduate students' activities and plan programs to meet students' needs. Graduate students design experiments and special equipment to conduct their work. They are expected to demonstrate, by supporting research or by designs, the ability to identify a problem, define alternatives, propose a solution, organize a design or an experimental investigation, manage the project to completion, and report the results through peer-reviewed papers and professional presentations.

Admission Requirements

Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from an engineering curriculum accredited by the Engineering Accreditation Commission of ABET (www.abet.org (http://www.abet.org)). Students without accredited degrees may be admitted provisionally and may be required to take additional courses.

A student must be accepted by an adviser in the department prior to official admission to the graduate program.

Degree Requirements

A candidate for either of the graduate degrees listed above follows an approved plan of study which must satisfy at least the minimum University requirements for that particular degree.

Faculty

John N. Veenstra, PhD, PE, BCEE—Professor and Interim Head

Professor and Decker Dawson Chair: John N. Veenstra, PhD, PE, BCEE
Regents Professor: Glenn O. Brown, PhD, PE
Professor and Orville L. and Helen Buchanan Endowed Chair: Carol Jones, PhD, PE
Professor and Biobased Products and Energy Center Director: Raymond L. Huhnke, PhD, PE
Professor, Sarkeys Chair, and Assistant Director Natural Resources, Oklahoma Cooperative Extension Service:
Randal K. Taylor, PhD, PE
Director, Capital Projects for DASNR and Assistant Director, Oklahoma Agricultural Experiment Station:
Randy L. Raper, PhD, PE
Professors: Danielle D. Bellmer, PhD; Timothy J. Bowser, PhD, PE; Michael Buser, PhD; Nurhan Dunford, PhD, PE; Daniel E. Storm, PhD; Dan Thomas, PhD, PE; Ning Wang, PhD, PE; Paul R. Weckler, PhD, PE
Professors Emeriti: Billy J. Barfield, PhD, PE; Ronald L. Elliott, PhD, PE; Michael D. Smolen, PhD; John Solie, PhD
Associate Professors: Hasan Atiyeh, PhD, PE; Robert Scott Frazier, PhD, PE; Douglas W. Hamilton, PhD, PE; PE; Ajay Kumar, PhD, PE; Yu Mao, PhD
Adjunct Associate Professor: Derek Whitelock, PhD
Assistant Professors: John Long, PhD; Saleh Taghvaeian, PhD
Adjunct Assistant Professor: Sherry L. Hunt, PhD
Associate Researchers: J. D. Carlson, PhD; Ron Miller, PhD
Assistant Extension Specialist: Albert J. Sutherland, MS
Teaching Associates: Ryan Clarke, Brent Haken

Biosystems Engineering: Bioprocessing & Food Processing, BSBE

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 128

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1414	General Chemistry for Engineers (LN)	4
BIOL 1114	Introductory Biology (LN)	4
Social & Behavioral Sciences (S)		
Course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		3
Additional General Education		
Any course designated (A) or (N)		3
Hours Subtotal		45
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
Mathematics		
MATH 2233	Differential Equations	3
Engineering & Engineering Science [2]		
ENGR 1332	Engineering Design with CAD for MAE	2
ENSC 2113	Statics [1]	3
ENSC 2143	Strength of Materials	3
ENSC 2213	Thermodynamics	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 3233	Fluid Mechanics [1]	3
Biosystems Engineering		
BAE 1012	Introduction to Biosystems Engineering	2
BAE 1022	Experimental Methods in Biosystems Engineering	2
BAE 2013	Modeling in Biosystems Engineering [1]	3
BAE 2023	Physical Properties of Biological Materials [1]	3
Hours Subtotal		38
Major Requirements		
Common Professional School		
STAT 4033	Engineering Statistics	3
or STAT 4073	Engineering Statistics with Design of Experiments	
IEM 3503	Engineering Economic Analysis	3
BAE 3013	Heat and Mass Transfer in Biological Systems	3
BAE 3023	Instruments and Controls	3
BAE 3213	Energy and Power in Biosystems Engineering	3
BAE 4001	Professional Practice in Biosystems Engineering	1
BAE 4012	Senior Engineering Design Project I	2
BAE 4023	Senior Engineering Design Project II	3
Specific Professional School		
BAE 4283	Bioprocess Engineering	3
BAE 4413	Food Engineering	3
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
Select one of the following:		4
BIOC 2344	Chemistry and Applications of Biomolecules	
BIOC 3653 & CHEM 3053	Survey of Biochemistry and Organic Chemistry	
Hours Subtotal		36
Electives		
Select 9 (or 7) hours of engineering and/or science electives to be selected from an approved list upon consultation with an advisor		9
Hours Subtotal		9
Total Hours		128

1. Courses that must be completed prior to admission to professional school.
2. Complete ENSC 2113 Statics, ENSC 3233 Fluid Mechanics, and 2 other ENSC courses prior to admission to Professional School.

Other Requirements

- Admission to Professional School is required. Refer to the OSU Catalog corresponding to your matriculation date for detailed admission requirements.
- A minimum grade of 'C' is required in each course that is a prerequisite for a major course.
- Students are required to complete the Fundamentals of Engineering (FE) exam prior to graduation.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Biosystems Engineering: Environmental and Natural Resources, BSBE

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 128

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1414	General Chemistry for Engineers (LN)	4
BIOL 1114	Introductory Biology (LN)	4
Social & Behavioral Sciences (S)		
Any course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		3
Additional General Education		
Any course designated (A) or (N)		3
Hours Subtotal		45
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
Mathematics		
MATH 2233	Differential Equations	3
Engineering & Engineering Science [2]		
ENGR 1332	Engineering Design with CAD for MAE	2
ENSC 2113	Statics [1]	3
ENSC 2143	Strength of Materials	3
ENSC 2213	Thermodynamics	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 3233	Fluid Mechanics [1]	3
Biosystems Engineering		
BAE 1012	Introduction to Biosystems Engineering	2
BAE 1022	Experimental Methods in Biosystems Engineering	2
BAE 2013	Modeling in Biosystems Engineering [1]	3
BAE 2023	Physical Properties of Biological Materials [1]	3
Hours Subtotal		38
Major Requirements		
Common Professional School		
STAT 4033	Engineering Statistics	3
or STAT 4073	Engineering Statistics with Design of Experiments	
IEM 3503	Engineering Economic Analysis	3
BAE 3013	Heat and Mass Transfer in Biological Systems	3
BAE 3023	Instruments and Controls	3
BAE 3213	Energy and Power in Biosystems Engineering	3
BAE 4001	Professional Practice in Biosystems Engineering	1
BAE 4012	Senior Engineering Design Project I	2
BAE 4023	Senior Engineering Design Project II	3
Specific Professional School		
BAE 4314	Design Hydrology	4
BAE 4324	Water Quality Engineering	4
NREM 2013	Ecology of Natural Resources	3
SOIL 2124	Fundamentals of Soil Science (N)	4
Hours Subtotal		36
Electives		
Select 9 hours of engineering and/or science electives to be selected from an approved list upon consultation with an advisor		9
Hours Subtotal		9
Total Hours		128

1 Courses that must be completed prior to admission to professional school.

2 Complete ENSC 2113 Statics, ENSC 3233 Fluid Mechanics, and 2 other ENSC courses prior to admission to Professional School.

Other Requirements

- Admission to Professional School is required.
- Refer to the OSU Catalog corresponding to your matriculation date for detailed admission requirements.
- A minimum grade of 'C' is required in each course that is a prerequisite for a major course.

- Students are required to complete the Fundamentals of Engineering (FE) exam prior to graduation.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Biosystems Engineering: Machine Systems & Agricultural Engineering, BSBE

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 128

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1414	General Chemistry for Engineers (LN)	4
BIOL 1114	Introductory Biology (LN)	4
Social & Behavioral Sciences (S)		
Any course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		3
Additional General Education		
Any course designated (A) or (N)		3
Hours Subtotal		45
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
Mathematics		
MATH 2233	Differential Equations	3
Engineering & Engineering Science [2]		
ENGR 1332	Engineering Design with CAD for MAE	2
ENSC 2113	Statics [1]	3
ENSC 2143	Strength of Materials	3
ENSC 2213	Thermodynamics	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 3233	Fluid Mechanics [1]	3
Biosystems Engineering		
BAE 1012	Introduction to Biosystems Engineering	2
BAE 1022	Experimental Methods in Biosystems Engineering	2
BAE 2013	Modeling in Biosystems Engineering [1]	3
BAE 2023	Physical Properties of Biological Materials [1]	3
Hours Subtotal		38
Major Requirements		
Common Professional School		
STAT 4033	Engineering Statistics	3
or STAT 4073	Engineering Statistics with Design of Experiments	
IEM 3503	Engineering Economic Analysis	3
BAE 3013	Heat and Mass Transfer in Biological Systems	3
BAE 3023	Instruments and Controls	3
BAE 3213	Energy and Power in Biosystems Engineering	3
BAE 4001	Professional Practice in Biosystems Engineering	1
BAE 4012	Senior Engineering Design Project I	2
BAE 4023	Senior Engineering Design Project II	3
Specific Professional School		
BAE 3223	Principles of Agriculture and Off-Road Machinery	3
BAE 4224	Machinery for Production and Processing	4
ENSC 2123	Elementary Dynamics	3
ENSC 3313	Materials Science	3
Hours Subtotal		34
Electives		
Select 11 hours of engineering and/or science electives to be selected from an approved list upon consultation with an advisor		11
Hours Subtotal		11
Total Hours		128

1 Courses that must be completed prior to admission to professional school.

2 Complete ENSC 2113 Statics, ENSC 3233 Fluid Mechanics, and 2 other ENSC courses prior to admission to Professional School.

Other Requirements

- Admission to Professional School is required.
- Refer to the OSU Catalog corresponding to your matriculation date for detailed admission requirements.
- A minimum grade of 'C' is required in each course that is a prerequisite for a major course.

- Students are required to complete the Fundamentals of Engineering (FE) exam prior to graduation.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Biosystems Engineering: Pre-Medical, BSBE

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 128

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1515	General Chemistry (LN)	5
BIOL 1114	Introductory Biology (LN)	4
Social & Behavioral Sciences (S)		
Any course designated (S)		3
Additional General Education		
Courses designated (A), (H), (N), or (S)		3
Additional General Education		
Any course designated (A) or (N)		3
Hours Subtotal		46
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
Mathematics		
MATH 2233	Differential Equations	3
Engineering & Engineering Science [2]		
ENGR 1332	Engineering Design with CAD for MAE	2
ENSC 2113	Statics [1]	3
ENSC 2143	Strength of Materials	3
ENSC 2213	Thermodynamics	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 3233	Fluid Mechanics [1]	3
Biosystems Engineering		
BAE 1012	Introduction to Biosystems Engineering	2
BAE 1022	Experimental Methods in Biosystems Engineering	2
BAE 2013	Modeling in Biosystems Engineering [1]	3
BAE 2023	Physical Properties of Biological Materials [1]	3
Hours Subtotal		38
Major Requirements		
Common Professional School		
STAT 4033	Engineering Statistics	3
or STAT 4073	Engineering Statistics with Design of Experiments	
IEM 3503	Engineering Economic Analysis	3
BAE 3013	Heat and Mass Transfer in Biological Systems	3
BAE 3023	Instruments and Controls	3
BAE 3213	Energy and Power in Biosystems Engineering	3
BAE 4001	Professional Practice in Biosystems Engineering	1
BAE 4012	Senior Engineering Design Project I	2
BAE 4023	Senior Engineering Design Project II	3
Specific Professional School		
Select BAE 4000 level (Any Upper Level BAE Classes, at least 5 hrs total)		5
CHEM 3053	Organic Chemistry	3
CHEM 3153	Organic Chemistry	3
CHEM 3112	Organic Chemistry Lab	2
MICR 2123	Introduction to Microbiology	3
BIOL 1604	Animal Biology	4
BIOC 3653	Survey of Biochemistry	3
or MICR 3033	Cell and Molecular Biology	
Hours Subtotal		44
Total Hours		128

[1] Courses that must be completed prior to admission to professional school.

[2] Complete ENSC 2113 Statics, ENSC 3233 Fluid Mechanics, and 2 other ENSC courses prior to admission to Professional School.

Other Requirements

- Admission to Professional School is required.
- Refer to the OSU Catalog corresponding to your matriculation date for detailed admission requirements.
- A minimum grade of 'C' is required in each course that is a prerequisite for a major course.

- Students are required to complete the Fundamentals of Engineering (FE) exam prior to graduation.
- A minimum of 40 semester credit hours and 100 grade points must be earned in courses numbered 3000 or above.
- A 2.00 GPA or higher in upper-division hours.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Chemical Engineering

Chemical engineers use knowledge of how nature works (science) and the language of science (mathematics) to create value and solve difficult problems for the benefit of society. The key skill that differentiates chemical engineering from other disciplines is the ability to understand, design and operate transformation (physical or chemical) processes. Chemical engineers literally change (transform) the world. Many in the public assume chemical engineers work only in chemical plants and petroleum refineries. The reality is that chemical engineers work in a broad range of industries including pharmaceuticals, biochemicals, semiconductor materials, foods, plastics, paper, steel, consumer goods, automotive, specialty materials, oil & gas production, renewable energy, engineering services, and the list goes on. Key to providing a benefit to society, chemical engineers are responsible for resource conservation, minimizing pollution, minimizing costs, and maximizing quality and safety of processes that make the products.

The emphasis on the molecular or chemical nature of everything people use is what makes chemical engineers different from other engineers. The emphasis on the processes that make the products is what makes chemical engineers different from chemists.

Chemical engineers often find themselves defining a problem or product, developing a process to do what is needed, and then designing the equipment to carry out the process. After the installation, chemical engineers commonly manage operations, oversee equipment maintenance, and supervise control of product quality. They trouble-shoot problems that hinder smooth operations, and they plan for future expansions or improvements. Their training and knowledge make them well qualified to market products and processing equipment. The varied background and experience of chemical engineers make them ideally suited for advancement into top-level managerial and executive positions. An advanced degree in chemical engineering is not required.

Many who aspire to careers in medicine or law first obtain BS degrees in chemical engineering. The rigor of the program and the emphasis on critical thinking and analytical reasoning are highly valued by professional school admission committees. A career as a research scientist or academic typically requires a PhD degree.

Program Educational Objectives

The School has three broad objectives. Within the first few years after graduation, our BS graduates will have demonstrated:

1. Competencies – skill in tools and techniques that are fundamental to the job - many of which need to be learned after graduation.
2. Professionalism – partnership in the mission and within the human context of the enterprise - ethics, effectiveness, and awareness of the broad context of the detailed work.
3. Balance – a wise self-direction to life, community, health, and self-view that finds the right balance between personal choices, which energizes self and others and enables effectiveness in relationships with others.

The goal of the BS degree program is to produce graduates who possess broad-based knowledge, skills and judgment that prepares them to succeed in the profession of engineering or in further studies at the graduate level, including medical school. To achieve this goal, the program is designed to progressively develop both technical and human skills.

In the pre-professional portion of the chemical engineering program (usually equivalent to two years of study), the focus is on the underlying scientific and mathematical principles of engineering, supplemented by appropriate general education courses in English, social sciences and humanities. Students who demonstrate proficiency in this portion of the program are eligible for admission to the professional school.

The curriculum in the professional school (typically the last two years) builds systematically upon the scientific knowledge acquired in the pre-professional curriculum. In professional school, students have the opportunity to focus in one of three emphasis areas:

1. the regular course prepares a graduate for a wide range of employment opportunities;
2. the pre-medical option is for those who wish preparation for medical school; and
3. the biomedical/biochemical option is for those who seek employment in bio-related professions.

Each emphasis area is accredited under the basic level EAC-ABET criteria for chemical engineering programs and each prepares a student for success in both employment and graduate study at OSU or other universities. A more complete description of exact degree requirements for the bachelor's-level curricula is given in the publication Undergraduate Programs and Requirements at OSU.

Each professional school course builds upon the preceding chemical engineering courses to develop the ability to identify and solve meaningful engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The course work includes sensitizing students to socially-related technical problems and their responsibilities as engineering professionals to behave ethically and protect occupational and public safety. The program culminates in the senior-year design courses in which the students integrate the analysis, synthesis and other abilities they have developed throughout the earlier portions of their study into a capstone experience. At this point, students will be able to design components, systems and processes that meet specific requirements, including such pertinent societal considerations as ethics, safety, environmental impact and aesthetics. The students will have developed and displayed the ability to design and conduct experiments essential to specific studies, and to analyze the experimental results and draw meaningful conclusions within an enterprise context.

Integral parts of this educational continuum from basic science through comprehensive engineering design are learning experiences that facilitate the students' abilities to function effectively in both individual and collaborative environments. To achieve this, the program provides every student with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and utilized as a part of their problem-solving experiences. Finally, the students' experience in solving ever-more-challenging problems gives them the ability to continue to learn independently throughout their professional careers.

Undergraduate Programs

- Chemical Engineering, BSCH (p. 1452)
- Chemical Engineering: Biomedical/Biochemical, BS (p. 1454)
- Chemical Engineering: Pre-Medical, BSCH (p. 1456)
- Petroleum Engineering (PETE), Minor (p. 1458)

Graduate Programs

The School of Chemical Engineering offers programs leading to the Master of Science and Doctor of Philosophy. A program of independent study and research on a project under the direction of a member of the Graduate Faculty will be satisfactorily completed by all graduate students. For the Master of Science candidate, the project may result in a thesis. For the Doctor of Philosophy candidate, the project will result in his or her dissertation.

Admission Requirements

Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from a chemical engineering curriculum approved by the ABET or a recognized equivalent from any international program.

Students with related undergraduate degrees, such as chemistry, automation engineering, etc. can be admitted conditionally, subject to completing prescribed undergraduate Chemical Engineering program courses. Admission is competitive based on undergraduate GPA, GRE and TOEFL (for international students), statement of interests, experience and recommendations.

The Master of Science Degree

Two options are offered for this degree, Research-Oriented and Practice-Oriented options. General requirements for the Research-Oriented MS degree in chemical engineering are 30 credit hours of work beyond the BS degree and an acceptable thesis. At least 18 hours must be in class work and a minimum of six hours of credit is required for thesis research. The general requirements for the Practice-Oriented MS degree are 32 credit hours of work beyond the BS, including two hours of credit assigned to an acceptable technical report. For both options, the courses taken must include:

Code	Title	Hours
CHE 5123	Advanced Chemical Reaction Engineering	3
CHE 5213	Selected Diffusional Unit Operations	3
CHE 5743	Chemical Engineering Process Modeling	3
CHE 5843	Principles of Chemical Engineering Thermodynamics	3

The Doctor of Philosophy Degree

The general credit requirement is a minimum of 90 credit hours beyond the BS degree, including at least 36 hours of credit for research and at least 30 hours of class work. The courses must include:

Code	Title	Hours
CHE 5123	Advanced Chemical Reaction Engineering	3
CHE 5213	Selected Diffusional Unit Operations	3
CHE 5743	Chemical Engineering Process Modeling	3
CHE 5843	Principles of Chemical Engineering Thermodynamics	3
CHE 6703	Research Methods in Chemical Engineering	3

Each student is responsible for consultation with his or her advisory committee in preparing the study plan.

Faculty

James R. (Rob) Whiteley, PhD, PE—Professor and Head

Professor and Edward Bartlett Chair: James R. (Rob) Whiteley, PhD, PE
Professor and Continental Resources Chair: Geir Hareland, PhD
Professor and BP (Amoco) Chair: Sundar V. Madihally, PhD
Professor: D. Alan Tree, PhD
Associate Professor, Harold Courson Chair and Petroleum Engineering Program Director: Runar Nygaard, PhD
Associate Professor and Robert N. Maddox Fellow : Heather D.N. Fahlenkamp, PhD
Associate Professor and Anadarko Petroleum Faculty Fellow: Joshua D. Ramsey, PhD, PE
Assistant Professor and Harold Courson Faculty Fellow: Clint P. Aichele, PhD
Assistant Professors: Marimuthu Andiappan, PhD; Prem L. Bikkina, PhD; Yu Feng, PhD; Seok-Jhin Kim, PhD; Jindal K. Shah, PhD; Ashlee Ford Versypt, PhD
Research Assistant Professor: Sayeed Mohammad, PhD
Clinical Assistant Professor: Brad Rowland, PhD
Lecturers: Kenneth B. Dickson, Michael R. Resetarits

Chemical Engineering, BSCH

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 130

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1515	General Chemistry (LN) [1]	5
PHYS 2014	General Physics (LN) [1]	4
Social & Behavioral Sciences (S)		
Any course designated (S)		6
Hours Subtotal		43
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2114	General Physics (LN) [1]	4
Engineering		
ENGR 1111	Introduction to Engineering	1
ENGR 1412	Introductory Engineering Computer Programming [1]	2
Engineering Science		
ENSC 2113	Statics	3
ENSC 2143	Strength of Materials	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 2213	Thermodynamics [1]	3
ENSC 3233	Fluid Mechanics [1]	3
ENSC 3313	Materials Science	3
Mathematics		
Select one of the following:		3
STAT 2013	Elementary Statistics (A)	
STAT 2023	Elementary Statistics for Business and Economics (A)	
STAT 2053	Elementary Statistics for the Social Sciences (A)	
STAT 4013	Statistical Methods I (A)	
STAT 4033	Engineering Statistics	
STAT 4053	Statistical Methods I for the Social Sciences (A)	
STAT 4073	Engineering Statistics with Design of Experiments	
Chemistry		
CHEM 3053	Organic Chemistry [1]	3
Select one of the following:		5
CHEM 3153 & CHEM 3112	Organic Chemistry and Organic Chemistry Lab [1]	
BIOC 3653 & BIOC 3723	Survey of Biochemistry and Biochemistry and Molecular Biology Laboratory [1]	
Hours Subtotal		36
Major Requirements		
Mathematics		
MATH 2233	Differential Equations [1]	3
or MATH 3263	Linear Algebra and Differential Equations	
Chemistry		
CHEM 3433	Physical Chemistry I	3
Chemical Engineering		
CHE 2033	Introduction to Chemical Process Engineering [1]	3
CHE 2581	Chemical Engineering Seminar I [1]	1
CHE 3013	Rate Operations I	3
CHE 3113	Rate Operations II	3
CHE 3123	Chemical Reaction Engineering	3
CHE 3333	Introduction to Transport Phenomena	3
CHE 3473	Chemical Engineering Thermodynamics	3
CHE 3581	Chemical Engineering Seminar II	1
CHE 4002	Chemical Engineering Laboratory I	2
CHE 4112	Chemical Engineering Laboratory II	2
CHE 4124	Chemical Engineering Design I	4
CHE 4224	Chemical Engineering Design II	4
CHE 4581	Chemical Engineering Seminar III	1
CHE 4843	Chemical Process Instrumentation and Control	3
Hours Subtotal		42
Controlled Electives		
Advanced Chemical Science		
Select 3 hours of the following:		3
ANSI 3423	Animal Genetics [2]	

BIOC 3653	Survey of Biochemistry [2]
BIOC 3723	Biochemistry and Molecular Biology Laboratory
BIOC 4113	Molecular Biology
BIOL 3023	General Genetics [2]
CHEM 3153	Organic Chemistry
CHEM 3353	Descriptive Inorganic Chemistry
CHEM 3553	Physical Chemistry II
CHEM 4020	Modern Methods of Chemical Analysis
FDSC 3373	Food Chemistry I
FDSC 4373	Food Chemistry II
GEOL 4403	Geochemistry
MICR 3033	Cell and Molecular Biology
similar advanced chemical transformation of matter courses approved by advisors	
Restricted Electives	
Select 6 hours of upper-level course credit meeting School objectives [3]	6
Hours Subtotal	9
Total Hours	130

1. Courses that must be completed prior to admission to professional school.
2. Cannot use both ANSI 3423 Animal Genetics & BIOL 3023 General Genetics or BIOC 3653 Survey of Biochemistry & BIOC 3713 Biochemistry I.
3. See School policy. CHE advisor must approve.

Other Requirements

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.00 is required in all CHE, CHEM, ENGR, and ENSC coursework.
2. The major engineering design experience, capstone course, is satisfied by CHE 4124 Chemical Engineering Design I and CHE 4224 Chemical Engineering Design II.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Chemical Engineering: Biomedical/Biochemical, BS

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 134

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
PHIL 3833	Biomedical Ethics (H) (or equivalent with Chemical Engineering Advisor approval)	3
Select 3 hour course designated (H)		3
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1515	General Chemistry (LN) [1]	5
BIOL 1114	Introductory Biology (LN) [1]	4
Social & Behavioral Sciences (S)		
Any course designated (S)		6
Hours Subtotal		43
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
Engineering		
ENGR 1111	Introduction to Engineering	1
ENGR 1412	Introductory Engineering Computer Programming [1]	2
Engineering Science		
ENSC 2113	Statics	3
ENSC 2143	Strength of Materials	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 2213	Thermodynamics [1]	3
ENSC 3233	Fluid Mechanics [1]	3
ENSC 3313	Materials Science	3
Mathematics		
Select one of the following:		3
STAT 2013	Elementary Statistics (A)	
STAT 2023	Elementary Statistics for Business and Economics (A)	
STAT 2053	Elementary Statistics for the Social Sciences (A)	
STAT 4013	Statistical Methods I (A)	
STAT 4033	Engineering Statistics	
STAT 4053	Statistical Methods I for the Social Sciences (A)	
STAT 4073	Engineering Statistics with Design of Experiments	
Chemistry		
CHEM 3053	Organic Chemistry [1]	3
Select one of the following:		5
CHEM 3153 & CHEM 3112	Organic Chemistry and Organic Chemistry Lab [1]	
BIOC 3653 & BIOC 3723	Survey of Biochemistry and Biochemistry and Molecular Biology Laboratory [1]	
Hours Subtotal		40
Major Requirements		
Mathematics		
MATH 2233	Differential Equations [1]	3
or MATH 3263	Linear Algebra and Differential Equations	
Chemistry		
CHEM 3433	Physical Chemistry I	3
Chemical Engineering		
CHE 2033	Introduction to Chemical Process Engineering [1]	3
CHE 2581	Chemical Engineering Seminar I [1]	1
CHE 3013	Rate Operations I	3
CHE 3113	Rate Operations II	3
CHE 3123	Chemical Reaction Engineering	3
CHE 3333	Introduction to Transport Phenomena	3
CHE 3473	Chemical Engineering Thermodynamics	3
CHE 3581	Chemical Engineering Seminar II	1
CHE 4002	Chemical Engineering Laboratory I	2
CHE 4112	Chemical Engineering Laboratory II	2
CHE 4124	Chemical Engineering Design I	4
CHE 4224	Chemical Engineering Design II	4
CHE 4581	Chemical Engineering Seminar III	1
CHE 4843	Chemical Process Instrumentation and Control	3

Hours Subtotal		42
Controlled Electives		
Advanced Chemical Science		
Select 3 hours of the following or similar advanced chemical transformation of matter courses approved by advisors:		3
ANSI 3423	Animal Genetics [2]	
BIOC 3653	Survey of Biochemistry [2]	
BIOC 3723	Biochemistry and Molecular Biology Laboratory	
BIOC 4113	Molecular Biology	
BIOL 3023	General Genetics [2]	
CHEM 3153	Organic Chemistry	
CHEM 3353	Descriptive Inorganic Chemistry	
CHEM 3553	Physical Chemistry II	
CHEM 4020	Modern Methods of Chemical Analysis	
FDSC 3373	Food Chemistry I	
FDSC 4373	Food Chemistry II	
GEOL 4403	Geochemistry	
MICR 3033	Cell and Molecular Biology	
Bioengineering/Bioscience Electives		
Select 6 hours of the following:		6
BAE 3113	Biological Applications in Engineering	
BAE 4413	Food Engineering	
BIOC 3224	Physical Chemistry for Biologists	
BIOC 3653	Survey of Biochemistry	
BIOC 4113	Molecular Biology	
BIOC 5824	Biochemical Laboratory Methods	
BIOL 1604	Animal Biology	
BIOL 3023	General Genetics	
CHE 4283	Bioprocess Engineering	
CHE 4293	Biomedical Engineering	
CHE 5283	Advanced Bioprocess Engineering	
CHE 5293	Advanced Biomedical Engineering	
MICR 2123 & MICR 2132	Introduction to Microbiology and Introduction to Microbiology Laboratory	
MICR 3033	Cell and Molecular Biology	
Hours Subtotal		9
Total Hours		134

[1] Courses that must be completed prior to admission to professional school.

[2] Cannot use both ANSI 3423 Animal Genetics & BIOL 3023 General Genetics or BIOC 3653 Survey of Biochemistry & BIOC 3713 Biochemistry I.

Other Requirements

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.00 is required in all CHE, CHEM, ENGR, and ENSC coursework.
2. The major engineering design experience, capstone course, is satisfied by CHE 4124 Chemical Engineering Design I and CHE 4224 Chemical Engineering Design II.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Chemical Engineering: Pre-Medical, BSCH

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 135

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Any course designated (H) [2]		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1515	General Chemistry (LN) [1]	5
BIOL 1114	Introductory Biology (LN) [1]	4
Social & Behavioral Sciences (S)		
Any course designated (S) [3]		6
Hours Subtotal		43
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
BIOL 1604	Animal Biology	4
Engineering		
ENGR 1111	Introduction to Engineering	1
ENGR 1412	Introductory Engineering Computer Programming [1]	2
Engineering Science		
ENSC 2113	Statics	3
ENSC 2143	Strength of Materials	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 2213	Thermodynamics [1]	3
ENSC 3233	Fluid Mechanics [1]	3
ENSC 3313	Materials Science	3
Chemistry		
CHEM 3053	Organic Chemistry [1]	3
CHEM 3112	Organic Chemistry Lab [1]	2
CHEM 3153	Organic Chemistry [1]	3
Hours Subtotal		41
Major Requirements		
Mathematics		
MATH 2233	Differential Equations [1]	3
or MATH 3263	Linear Algebra and Differential Equations	
Select one of the following:		3
STAT 2013	Elementary Statistics (A)	
STAT 2023	Elementary Statistics for Business and Economics (A)	
STAT 2053	Elementary Statistics for the Social Sciences (A)	
STAT 4013	Statistical Methods I (A)	
STAT 4033	Engineering Statistics	
STAT 4053	Statistical Methods I for the Social Sciences (A)	
STAT 4073	Engineering Statistics with Design of Experiments	
Chemistry		
CHEM 3433	Physical Chemistry I	3
Chemical Engineering		
CHE 2033	Introduction to Chemical Process Engineering [1]	3
CHE 2581	Chemical Engineering Seminar I [1]	1
CHE 3013	Rate Operations I	3
CHE 3113	Rate Operations II	3
CHE 3123	Chemical Reaction Engineering	3
CHE 3333	Introduction to Transport Phenomena	3
CHE 3473	Chemical Engineering Thermodynamics	3
CHE 3581	Chemical Engineering Seminar II	1
CHE 4002	Chemical Engineering Laboratory I	2
CHE 4112	Chemical Engineering Laboratory II	2
CHE 4124	Chemical Engineering Design I	4
CHE 4224	Chemical Engineering Design II	4
CHE 4581	Chemical Engineering Seminar III	1
CHE 4843	Chemical Process Instrumentation and Control	3
Hours Subtotal		45
Controlled Electives		
Advanced Chemical Science		
BIOL 3023	General Genetics	3
or MICR 3033	Cell and Molecular Biology	
Bioengineering/Bioscience Electives		

Select 3 hours of the following:		3
CHE 4283	Bioprocess Engineering	
CHE 4293	Biomedical Engineering	
CHE 5283	Advanced Bioprocess Engineering	
CHE 5293	Advanced Biomedical Engineering	
Or with approval of Chemical Engineering Advisor, select from the following:		
BAE 3113	Biological Applications in Engineering	
BAE 4413	Food Engineering	
BIOC 3224	Physical Chemistry for Biologists	
BIOC 3653	Survey of Biochemistry	
BIOC 4113	Molecular Biology	
Hours Subtotal		6
Total Hours		135

[1] Courses that must be completed prior to admission to professional school.

[2] Humanities courses - should select one from ENGL and one ART, ENGL, FLL, MUSI, PHIL or TH to also meet medical school requirements

[3] Social & Behavioral Sciences courses – should select from ANTH, PSYC, or SOC to also meet medical school requirements.

Other Requirements

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.00 is required in all CHE, CHEM, ENGR, and ENSC coursework.
2. The major engineering design experience, capstone course, is satisfied by CHE 4124 Chemical Engineering Design I and CHE 4224 Chemical Engineering Design II.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Petroleum Engineering (PETE), Minor

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Runar Nygaard, runar.nygaard@okstate.edu, 420 Engineering North 405-744-5280

Minimum Overall Grade Point Average: 2.50
Total Hours: 18 hours

Code	Title	Hours
Minor Requirements		
GEOL 3413	Petroleum Geology for Engineers	3
GEOL 4323	Applied Well Log Analysis for Engineers	3
PETE 4303	Petroleum Rock and Fluids	3
PETE 4313	Drilling and Well Completions	3
PETE 4333	Production Operations	3
PETE 4343	Reservoir Engineering and Well Testing	3

GEOL 3413 Petroleum Geology for Engineers is a prerequisite for all other courses. PETE 4303 Petroleum Rock and Fluids is a prerequisite for PETE 4313 Drilling and Well Completions, PETE 4333 Production Operations and PETE 4343 Reservoir Engineering and Well Testing.

Additional OSU Requirements

Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf).

Civil and Environmental Engineering

Civil engineers build the future. The exceptional diversity of professional practice in civil and environmental engineering presents many career opportunities for students.

The concern of civil engineers is infrastructure - the design, construction, management, alteration and utilization, which allows society to function. Civil engineers plan, design and construct, highways, waterway and railway systems, harbors and shipping facilities, systems for the treatment and distribution of water and for the collection and treatment of municipal and industrial waste, dams and hydroelectric works, airports and terminals, structures of every kind including buildings, bridges, towers, industrial plants, tunnels and subway systems, processes for the control of water and air pollution, and many other works of general benefit to society.

The professional curriculum in civil engineering is based on the pre-professional courses in mathematics, physical sciences and engineering sciences. On this foundation, required courses equip the student with the basic skills needed for the professional practice of civil engineering and provide the tools for more advanced study. Engineering theory and principles are developed in a way that will encourage their application to the practical solution of problems.

Educational Objectives

The Bachelor of Science in Civil Engineering degree program educates and prepares engineers who a few years after graduation will be:

1. Contributing to society through the practice of civil engineering in a variety of contexts, including the protection of public health and safety and the development of sustainable engineering solutions;
2. Effectively applying the technical knowledge, engineering principles, communication skills and personal attributes necessary to be adaptable and successful in the civil engineering profession;
3. Advancing within their profession, including attaining professional licensure and positions of leadership; and
4. Exhibiting life-long learning, including the pursuit of advanced degrees.

The curriculum is designed to enable students to satisfy the educational objectives in conjunction with the student outcomes. These outcomes state that graduates of the program will have:

a. an ability to apply knowledge of mathematics, science, and engineering,
b. an ability to design and conduct experiments, as well as to analyze and interpret data,
c. an ability to design systems, components, or processes to meet desired needs within realistic constraints (such as economic, environmental, social, political, ethical, health, safety, and sustainability),
d. an ability to function on multi-disciplinary teams,
e. an ability to identify, formulate, and solve engineering problems,
f. an understanding of professional and ethical responsibility,
g. an ability to communicate effectively,
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context,
i. a recognition of the need for, and an ability to engage in life-long learning, including an understanding of the importance of professional licensure,
j. a knowledge of contemporary issues, and
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The School provides a curriculum that is effective and balanced among the major areas of civil engineering practice. Design capabilities are developed throughout the curriculum, culminating in a comprehensive senior design experience, incorporating much of the previous course work. Some degree of specialization is provided through the choice of elective courses in structures, engineering mechanics, transportation engineering, soil mechanics and foundations, construction engineering and management, environmental engineering and water resources. There is a designated option for those students wishing to concentrate more heavily in the environmental area of practice. Program curricula requirements are outlined in the publication Undergraduate Program and Requirements. The general civil option and the environmental option are accredited together by the Engineering Accreditation Commission of the ABET under the criteria for civil and similarly named engineering programs.

Southern Plains Transportation Center

Oklahoma State University, and seven other universities are members of the Southern Plains Transportation Center (SPTC). The regional transportation center is a US DOT designated Region 6 University Transportation Center (UTC) and cooperative venture with the Oklahoma Department of Transportation (ODOT), and other transportation agencies, operators and suppliers. The mission of the Center is to develop and transmit knowledge through research, training, technical assistance, and technology transfer; and to enhance the transportation systems that touch the lives of the people of Oklahoma and the region.

Undergraduate Programs

- Civil Engineering, BSCV (p. 1461)
- Civil Engineering: Environmental, BSCV (p. 1463)

Graduate Programs

The School of Civil and Environmental Engineering offers three programs leading to post-baccalaureate degrees— the Master of Science degree in civil engineering, the Master of Science degree in environmental engineering, and the Doctor of Philosophy degree. The Master of Science degree is characterized by a technical specialization in a particular area of study. The Doctor of Philosophy degree is designed to prepare students for research and for the teaching profession in engineering.

Major areas of study in the School are applied mechanics, structural analysis, design, transportation, materials, construction engineering and management, geotechnical engineering, water resources, and environmental engineering. Research in all major fields is continuously pursued. Master of Science in Civil Engineering candidates may choose either to specialize or to engage in a broadly based program of study, in accordance with an approved and purposeful plan of study.

Admission Requirements

Candidates for the Master of Science or Doctor of Philosophy degree should have graduated from a civil engineering curriculum accredited by ABET. Graduates from other curricula and schools should submit transcripts to the head of the School of Civil and Environmental

Engineering for evaluation. Admission to the Master of Science in environmental engineering degree program is permitted for students who meet the minimum prerequisites as established by the School of Civil and Environmental Engineering.

Degree Requirements

All degree programs follow an approved plan of study that must be submitted at a designated time. All programs are characterized by the flexibility available in a study plan that is designed to satisfy the particular needs of the student, while conforming to the general requirements implied by the title of the degree and specified by the University.

The Master of Science degree in either civil or environmental engineering requires the completion of at least 30 credit hours beyond the bachelor's degree, including a research thesis for which no more than six credit hours may be granted. The non-thesis option (32 credit hours) described in the Graduate College section may be permitted at the discretion of the student's advisory committee.

The Doctor of Philosophy degree requires the completion of at least 90 credit hours of course work beyond the bachelor's degree, including not more than 30 credit hours for the research thesis. In addition, the candidate must meet the equivalency of the language requirement (six hours) in selected areas at the discretion of his or her committee to facilitate his or her research. Generally, official admission as a candidate for the Doctor of Philosophy degree in any program offered by the School will not be granted until a member of the Graduate Faculty in the School agrees to serve as major (or thesis) adviser for the prospective candidate.

Faculty

Norbert (Norb) Delatte, PhD —Professor and Head
Professor and M. R. Lohmann Chair: Norbert (Norb) Delatte, PhD
Dean, College of Engineering, Architecture and Technology, Professor and Donald & Cathey Humphreys Chair: Paul J. Tikalsky, PhD
Professor and Williams Foundation Professorship: Tyler Ley, PhD, PE
Professor and Gilbert, Cooper, W&W Steel Chair: C. (Kelvin) Wang, PhD, PE
Professor and Decker Dawson Chair: John N. Veenstra, PhD, PE
Professors: S.A. Ahmed, PhD, PE; Gouranga Banik, PhD, PE, F.ASCE; Stephen A. Cross, PhD, PE;
John N. Veenstra, PhD, PE; Avdhesh Tyagi, PhD, PE
Associate Professors: Rifat Bulut, PhD; Robert Emerson, PhD, PE; Bruce Russell, PhD, PE; Gregory G. Wilber, PhD, PE
Assistant Professors: Julie Hartell, PhD; Mark Krzmarzick, PhD, PE; David Lampert. PhD, PE; Qiang Li, PhD; Yong Wei Shan, PhD, PE; Mohamad Soliman, PhD; Xiaoming Yang, PhD, PE
Adjunct Professors: Garry Gregory, PhD, PE; Boris Dan Hernandez, PhD; Enos Stover, PhD, PE;
Brian Wintle, PhD, PE
Lecturer: Joe Echelle

Civil Engineering, BSCV

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 128

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 3323	Technical Writing	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course.		
CHEM 1414	General Chemistry for Engineers (LN) [1]	4
or CHEM 1515	General Chemistry (LN)	
BIOL 1114	Introductory Biology (LN)	4
or GEOL 1114	Physical Geology (LN)	
Social & Behavioral Sciences (S)		
SPCH 2713	Introduction to Speech Communication (S)	3
Select 3 hours of any course designated (S)		3
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan.		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
Engineering		
ENGR 1111	Introduction to Engineering [1]	1
ENGR 1322	Engineering Design with CAD [1]	2
ENGR 1412	Introductory Engineering Computer Programming [1]	2
Engineering Science		
ENSC 2113	Statics [1]	3
ENSC 2123	Elementary Dynamics	3
ENSC 2143	Strength of Materials [1]	3
Civil Engineering		
CIVE 2041	Civil and Environmental Engineering Seminar	1
CIVE 3614	Engineering Surveying	4
CIVE 3813	Environmental Engineering Science	3
Hours Subtotal		30
Major Requirements		
Mathematics		
MATH 2233	Differential Equations [1]	3
STAT 4033	Engineering Statistics	3
or STAT 4073	Engineering Statistics with Design of Experiments	
Engineering Science		
ENSC 3233	Fluid Mechanics [1]	3
Civil Engineering		
CIVE 3413	Structural Analysis [1]	3
CIVE 3513	Structural Steel Design	3
CIVE 3523	Reinforced Concrete Design	3
CIVE 3623	Engineering Materials Laboratory	3
CIVE 3633	Transportation Engineering	3
CIVE 3714	Introduction to Geotechnical Engineering	4
CIVE 3833	Applied Hydraulics	3
CIVE 3843	Hydrology I	3
CIVE 4041	Engineering Practice	1
CIVE 4043	Senior Design	3
CIVE 4273	Construction Engineering and Project Management	3
CIVE 4833	Unit Operations in Environmental Engineering	3
Industrial Engineering & Management		
IEM 3503	Engineering Economic Analysis	3
Hours Subtotal		47
Electives		
Select 9 hours of 4000 level courses in Civil Engineering not required in the curriculum		9
Hours Subtotal		9
Total Hours		128

[1] Complete courses prior to admission to Professional School.

Other Requirements

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.00 is required in Professional School coursework (right hand column).
2. A 'C' or better is required in each course that is a prerequisite for a CIVE course.
3. The major engineering design experience, capstone course, is satisfied by CIVE 4043 Senior Design. If "B" or higher is not earned in

ENGL 1113 Composition I, then ENGL 1213 Composition II must be completed.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Civil Engineering: Environmental, BSCV

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 128

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 3323	Technical Writing	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course.		
CHEM 1414	General Chemistry for Engineers (LN) [1]	4
or CHEM 1515	General Chemistry (LN)	
BIOC 2344	Chemistry and Applications of Biomolecules	4
or BIOL 1114	Introductory Biology (LN)	
Social & Behavioral Sciences (S)		
SPCH 2713	Introduction to Speech Communication (S)	3
Select 3 hours of any course designated (S)		3
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan.		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
Engineering		
ENGR 1111	Introduction to Engineering	1
ENGR 1322	Engineering Design with CAD	2
ENGR 1412	Introductory Engineering Computer Programming	2
Engineering Science		
ENSC 2113	Statics [1]	3
ENSC 2123	Elementary Dynamics	3
ENSC 2143	Strength of Materials [1]	3
Civil Engineering		
CIVE 2041	Civil and Environmental Engineering Seminar	1
CIVE 3614	Engineering Surveying	4
CIVE 3813	Environmental Engineering Science	3
Hours Subtotal		30
Major Requirements		
Mathematics		
MATH 2233	Differential Equations [1]	3
STAT 4033	Engineering Statistics	3
or STAT 4073	Engineering Statistics with Design of Experiments	
Engineering Science		
ENSC 3233	Fluid Mechanics [1]	3
Civil Engineering		
CIVE 3413	Structural Analysis	3
CIVE 3523	Reinforced Concrete Design	3
CIVE 3853	Environmental Engineering Laboratory	3
CIVE 3623	Engineering Materials Laboratory	3
CIVE 3633	Transportation Engineering	3
CIVE 3714	Introduction to Geotechnical Engineering	4
CIVE 3833	Applied Hydraulics	3
CIVE 3843	Hydrology I	3
CIVE 4041	Engineering Practice	1
CIVE 4143	Environmental Engineering Design	3
CIVE 4273	Construction Engineering and Project Management	3
CIVE 4833	Unit Operations in Environmental Engineering	3
Industrial Engineering & Management		
IEM 3503	Engineering Economic Analysis	3
Hours Subtotal		47
Electives		
Select 9 hours of the following:		9
CIVE 4010	Civil Engineering Research	
CIVE 4013	Aquatic Chemistry	
CIVE 4833	Unit Operations in Environmental Engineering	
CIVE 4863	Advanced Unit Operations in Environmental Engineering	
CIVE 4873	Air Pollution Control Engineering	
CIVE 4883	Introduction to Environmental Modeling	
CIVE 4933	Water Treatment	
CIVE 5010	Civil Engineering Seminar	
CIVE 5013	Aquatic Chemistry	
CIVE 5123	The Legal and Regulatory Environment of Engineering	
CIVE 5823	Environmental Risk Assessment and Management	
CIVE 5833	Introduction to Environmental Modeling	

CIVE 5863	Advanced Unit Operations in Environmental Engineering	
CIVE 5873	Air Pollution Control Engineering	
CIVE 5883	Residuals and Solid Waste Management	
CIVE 5933	Water Treatment	
CIVE 5953	Biological Waste Treatment	
Hours Subtotal		9
Total Hours		128

[1] Complete courses prior to admission to Professional School.

Other Requirements

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.00 is required in Professional School coursework (right hand column).
2. A 'C' or better is required in each course that is a prerequisite for a CIVE course.
3. The major engineering design experience, capstone course, is satisfied by CIVE 4143 Environmental Engineering Design. If "B" or higher is not earned in ENGL 1113 Composition I, then ENGL 1213 Composition II must be completed.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Construction Management Technology

The construction industry is the largest industry in the world. Leadership in this field requires a broad knowledge of labor, materials and equipment, capital and construction procedures. The interdisciplinary approach of the construction management technology program offers the student specialized course work in all phases of construction, designed to prepare him or her for responsible positions in industry.

The primary goal of the Department of Construction Management Technology (CMT) is to enhance the quality of the instructional program through effective management of the curriculum, teaching assignments and fiscal and physical resources. This goal includes providing instructional facilities, equipment and support services for faculty and students which maintain an excellent learning environment.

Program Educational Objectives

OSU Construction Management Technology graduates a few years after graduation will:

1. Solve problems typically found in the construction industry in construction engineering design, estimating, planning, scheduling and project management using mathematical, analytical, and scientific skills of engineering technology.
2. Successfully work in teams and communicate effectively in written, oral and graphical forms.
3. Continue life-long career and professional growth by actively interacting with local industries and participating in appropriate professional societies.
4. Continue life-long personal growth in sensitivity to ethical responsibilities, global environments, and associated social issues.

Construction Management Technology graduates can expect to obtain these student outcomes upon graduation:

1. An ability to select and apply the knowledge, techniques, skills and modern tools of the discipline to broadly-defined engineering technology activities;
2. An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
3. An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
4. An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
5. An ability to function effectively as a member or leader on a technical team;
6. An ability to identify, analyze, and solve broadly-defined engineering technology problems;
7. An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
8. An understanding of the need for and an ability to engage in self-directed continuing professional development;
9. An understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
10. A knowledge of the impact of engineering technology solutions in a societal and global context; and
11. A commitment to quality, timeliness, and continuous improvement.

Faculty with excellent credentials, including a balance of formal education, teaching ability and appropriate industry experience, are recruited nationwide and are provided opportunities for individual professional development and regular contact with the industry. Faculty members are encouraged to become involved in extension and research programs relating to the department's areas of strength or growth and to serve the needs for continuing education within the industry, particularly in the southwestern construction community.

These needs and opportunities for service are assessed regularly through close cooperation with local and regional construction professionals and industry associations. An active Construction Management Advisory Board, representing a broad cross-section of the industry, meets regularly to offer support and guidance necessary to preserve uncompromising excellence.

The Construction Management Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org. The educational objectives of the Department of Construction Management Technology are consistent with those required by ETAC of ABET and are listed under "Division of Engineering Technology" in the Catalog.

Undergraduate Admission

Students who satisfy the CEAT admission requirements are eligible to enroll for the first two years of the program in the lower division of the curriculum for construction management technology. In order to balance the number of students in the CMT upper division with available CMT resources, advancement to the CMT upper division is by application. Applications are due to the CMT Department no later than the last working day of April each year. To be eligible for program advancement, lower division students must have:

1. Completed 60 credit hours of course work counting toward the CMT degree.
2. Completed all of the required (shaded) courses on the Degree Requirement Sheet (these courses are also listed on the Calculation Work Sheet of the Application to Upper Division form)
3. Achieved a grade of 'C' or better in the following courses:

Code	Title	Hours
CMT 1213	Introduction to Construction	3
CMT 2253	Construction Drawings	3
CMT 2263	Estimating I	3
ACCT 2103	Financial Accounting	3
PHYS 1214	General Physics (LN)	4
GENT 2323	Statics	3
MATH 2123	Calculus for Technology Programs I (A)	3
CMT 2343	Concrete Technology	3

   A substitution for any of these courses must meet the same 'C' requirement.
4. Achieved a minimum Selection GPA (SGPA) of 3.05.

Annually, students who meet these criteria for program advancement and have made a timely application for admission to the upper division will be admitted to the upper division of the CMT curriculum. The Selection Grade Point Average (SGPA) is a weighted GPA based upon specified lower division courses which have proven to be good indicators of student success in the program. For consideration of admission to the upper division of the Construction Management Technology program, the following courses and multipliers will be used in calculating SPGA's: CMT 2343 Concrete Technology (x3 multiplier), CMT 2263 Estimating I (x3 multiplier), GENT 2323 Statics (x3 multiplier), CMT 2253 Construction Drawings (x2 multiplier), CMT 1213 Introduction to Construction (x2 multiplier), MATH 2123 Calculus for Technology Programs I (A) (x2 multiplier), PHYS 1114 General Physics (LN) (x2 multiplier), SPCH 2713 Introduction to Speech Communication (S) (x2 multiplier), ENGL 1113 Composition I (x2 multiplier), PHYS 1214 General Physics (LN) (x1 multiplier), MATH 2133 Calculus for Technology Programs II (A) (x1 multiplier), EET 1003 Introduction to Microcomputer Programming (x1 multiplier) and ACCT 2103 Financial Accounting (x1 multiplier). Additional detailed information concerning admission to the upper division may be obtained directly from the CMT department.

Transfer students are required to furnish transcripts and course descriptions for previous classroom courses, as well as examples of previous academic work. Evaluation and enrollment by the CMT department is on a course-by-course basis for all transfer students.

The modern constructor must have a great deal of technical knowledge to keep abreast of rapidly changing equipment, materials and methods of construction. Specialized courses in estimating, surveying, structures, construction planning and scheduling, construction law and insurance, field and office management and construction procedures provide students with the background necessary for today's construction industry. These specialized courses, in addition to a blend of the basic sciences, business, and general studies, produce a well-balanced curriculum for students in construction management technology. Special attention is given to computer applications in construction estimating, and the development of graphic, written and oral communication skills is emphasized throughout the curriculum.

Students with an interest in building structures may select courses in the "building" option of the construction management technology curriculum, which provides them with knowledge of working drawings, mechanical and electrical equipment of buildings, and other course work for a career in building construction.

Students with an interest in civil engineering structures may select courses in the "heavy" option of the construction management technology curriculum, which provides them with knowledge of highways, soils, foundations and other course work for a career in the heavy and industrial construction industry.

The department attempts to identify and recruit highly qualified students who will benefit from the instructional program, and faculty members promote retention and ultimate graduation of construction management technology students through effective instruction and advisement. An active program of outcome assessment among graduates and their employers assures that the program continues to provide the academic training required for success.

Graduates of construction management technology have shown the curriculum to be successful in their development as productive members of the construction industry, holding responsible positions as project managers, estimators, material and equipment salespersons, and construction managers at all levels.

Undergraduate Programs

- Construction Management Technology: Building, BSET (p. 1467)
- Construction Management Technology: Heavy, BSET (p. 1469)

Faculty

Heather Yates, EdD, AC—Associate Professor and Program Coordinator
Professor: Mark H. Pruitt, MS, MArch, RA
Assistant Professors: Lantz Holtzhower, PhD; Jonghoon Kim, PhD; Rachel Mosier, PhD, PE

Construction Management Technology: Building, BSET

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 124

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 1213	Composition II	3
or ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing [1]	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2123	Calculus for Technology Programs I (A) [1,2]	3
MATH 2133	Calculus for Technology Programs II (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course.		
PHYS 1114	General Physics (LN) [2]	4
PHYS 1214	General Physics (LN) [2]	4
Select 4 hours of Natural Science with N and L designations		4
Social & Behavioral Sciences (S)		
Courses designated (S)		6
Hours Subtotal		45
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan.		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Specialty		
CMT 1213	Introduction to Construction [1,2]	3
CMT 2253	Construction Drawings [1,2]	3
CMT 2263	Estimating I [1,2]	3
CMT 2343	Concrete Technology [1,2]	3
Related Specialty		
ACCT 2103	Financial Accounting [1,2]	3
EET 1003	Introduction to Microcomputer Programming [1]	3
GENT 2323	Statics [1,2]	3
Hours Subtotal		21
Major Requirements		
Communications		
SPCH 2713	Introduction to Speech Communication (S) [1]	3
Specialty		
CMT 3273	Scheduling Construction Projects [2]	3
CMT 3322	Construction Practicum I [2]	2
CMT 3332	Construction Practicum II [2]	2
CMT 3364	Structures I [2]	4
CMT 3433	Principles of Site Development	3
CMT 3554	Structures II	4
CMT 4263	Estimating II [2]	3
CMT 4283	Business Practices for Construction [2]	3
CMT 4293	Construction Manager Concepts	3
CMT 4333	Equipment Management for Constructors [2]	3
CMT 4443	Construction Safety and Loss Control	3
CMT 4533	Heavy and Highway Estimating	3
CMT 4563	Construction Law and Insurance [2]	3
Related Specialty		
CIVE 3614	Engineering Surveying [2]	4
CMT 3323	Strength of Materials for Construction Managers [2]	3
IEM 3513	Economic Decision Analysis	3
Hours Subtotal		52
Electives		
Select 6 hours of the following:		6
ARCH 3134	Architectural Science I: Thermal Systems and Life Safety	
BCOM 3223	Oral Communication	
CIVE 3633	Transportation Engineering	
CIVE 5133	Construction Contracts and Specifications	
CIVE 5153	Contract Administration	
CIVE 5653	Asphalt Materials and Mix Design	
CMT 3463	Environmental Building Systems	
CMT 3633	CAD and BIM for Construction Managers	
CMT 4050	Advanced Construction Management Problems	
CMT 4273	Computer Estimating	
ECON 3023	Managerial Economics	
ECON 3513	Labor Economics	
ECON 3613	International Economic Relations (S)	
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior	
EEE 4223	Entrepreneurial Marketing	
EEE 4533	Growing Small and Family Ventures	
EEE 4703	Project Management for Entrepreneurship	
FIN 3113	Finance	
LSB 3213	Legal and Regulatory Environment of Business	
MGMT 3013	Fundamentals of Management (S)	
MGMT 3313	Human Resource Management	

	MGMT 4123	Labor Management Relations
	MKTG 3213	Marketing (S)
	MKTG 3433	Promotional Strategy
	MKTG 3513	Sales Management
	PHIL 3803	Business Ethics (H)
	PHIL 3823	Engineering Ethics
	SPCH 3703	Small Group Communication
	SPCH 3723	Business and Professional Communication
Hours Subtotal		6
Total Hours		124

[1] Complete all required courses prior to admission to Upper Division. (These courses are also listed on the *Calculation Work Sheet of the CMT Application to Upper Division form.*)

[2] Achieve a grade of 'C' or better.

Other Requirements

Admission to Upper Division (required)

1. Refer to the OSU Catalog corresponding to your matriculation date and the *Policy for Admission to the Upper Division of the Curriculum for CMT* for detailed admissions requirements.
2. Complete a minimum of 60 credit hours (from the degree plan) prior to admission to Upper Division.
3. Achieve a minimum Selection GPA (SGPA) of 3.05 (from the *Calculation Work Sheet of the CMT Application to Upper Division form*).

Graduation Requirements

1. A minimum overall GPA of 2.30 is required in all courses with engineering and engineering technology prefixes.
2. A grade of 'C' or better is required in each course that is a prerequisite to a required course that has an engineering or engineering technology prefix.
3. Each student is required to sit for the American Institute of Constructors Level 1 – Associate Constructors Certification Exam.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Construction Management Technology: Heavy, BSET

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 124

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 1213	Composition II	3
or ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2123	Calculus for Technology Programs I (A) [1,2]	3
MATH 2133	Calculus for Technology Programs II (A) [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course.		
PHYS 1114	General Physics (LN) [2]	4
PHYS 1214	General Physics (LN) [2]	4
Select 4 hours of Natural Science with N and L designations		4
Social & Behavioral Sciences (S)		
Courses designated (S)		6
Hours Subtotal		45
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan.		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Specialty		
CMT 1213	Introduction to Construction [1,2]	3
CMT 2253	Construction Drawings [1,2]	3
CMT 2263	Estimating I [1,2]	3
CMT 2343	Concrete Technology [1,2]	3
Related Specialty		
ACCT 2103	Financial Accounting [1,2]	3
EET 1003	Introduction to Microcomputer Programming [1]	3
GENT 2323	Statics [1,2]	3
Hours Subtotal		21
Major Requirements		
Communications		
SPCH 2713	Introduction to Speech Communication (S) [1]	3
Specialty		
CMT 3273	Scheduling Construction Projects [2]	3
CMT 3322	Construction Practicum I [2]	2
CMT 3332	Construction Practicum II [2]	2
CMT 3364	Structures I [2]	4
CMT 3433	Principles of Site Development	3
CMT 3463	Environmental Building Systems	3
CMT 3554	Structures II	4
CMT 4263	Estimating II [2]	3
CMT 4273	Computer Estimating [2]	3
CMT 4283	Business Practices for Construction [2]	3
CMT 4293	Construction Manager Concepts	3
CMT 4443	Construction Safety and Loss Control	3
CMT 4563	Construction Law and Insurance [2]	3
Related Specialty		
CIVE 3614	Engineering Surveying [2]	4
CMT 3323	Strength of Materials for Construction Managers [2]	3
IEM 3513	Economic Decision Analysis	3
Hours Subtotal		52
Electives		
Select 6 hours of the following:		6
ARCH 3134	Architectural Science I: Thermal Systems and Life Safety	
BCOM 3223	Oral Communication	
CIVE 3633	Transportation Engineering	
CIVE 5133	Construction Contracts and Specifications	
CIVE 5153	Contract Administration	
CIVE 5653	Asphalt Materials and Mix Design	
CMT 3633	CAD and BIM for Construction Managers	
CMT 4050	Advanced Construction Management Problems	
CMT 4333	Equipment Management for Constructors	
CMT 4533	Heavy and Highway Estimating	
ECON 3023	Managerial Economics	
ECON 3513	Labor Economics	
ECON 3613	International Economic Relations (S)	
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior	
EEE 4223	Entrepreneurial Marketing	
EEE 4533	Growing Small and Family Ventures	
EEE 4703	Project Management for Entrepreneurship	
FIN 3113	Finance	
LSB 3213	Legal and Regulatory Environment of Business	
MGMT 3013	Fundamentals of Management (S)	
MGMT 3313	Human Resource Management	

	MGMT 4123	Labor Management Relations
	MKTG 3213	Marketing (S)
	MKTG 3433	Promotional Strategy
	MKTG 3513	Sales Management
	PHIL 3803	Business Ethics (H)
	PHIL 3823	Engineering Ethics
	SPCH 3703	Small Group Communication
	SPCH 3723	Business and Professional Communication
Hours Subtotal		6
Total Hours		124

[1] Complete all courses prior to admission to Upper Division (these courses are also listed on the *Calculation Work Sheet of the CMT Application to Upper Division* form.

[2] Achieve a grade of 'C' or better.

Other Requirements

Admission to Upper Division (required)

1. Refer to the OSU Catalog corresponding to your matriculation date and the *Policy for Admission to the Upper Division of the Curriculum for CMT* for detailed admissions requirements.
2. Complete a minimum of 60 credit hours (from the degree plan) prior to admission to Upper Division.
3. Achieve a minimum Selection GPA (SGPA) of 3.05 (from the *Calculation Work Sheet of the CMT Application to Upper Division form*).

Graduation Requirements

1. A minimum overall GPA of 2.30 is required in all courses with engineering and engineering technology prefixes.
2. A grade of 'C' or better is required in each course that is a prerequisite to a required course that has an engineering or engineering technology prefix.
3. Each student is required to sit for the American Institute of Constructors Level 1 – Associate Constructors Certification Exam.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Division of Engineering Technology

Engineering technology education is concerned with the real-world application of engineering achievement with emphasis on the end product rather than the conceptual process. Whereas the development of new methods is the mark of the engineer, effective use of established methods is the mark of the engineering technologist. Often the technologist will be expected to implement what the engineer conceives.

Curricula

Engineering technology curricula at OSU are four-year programs which lead to the Bachelor of Science in Engineering Technology. Graduates of the program are known as "technologists and/or applied engineers" and are trained either to assist engineers or to provide independent support for engineering activities. The graduate receives an intensive education in his or her technical specialty and great depth in mathematics and technical sciences. The program provides breadth in related technical, communication and socio-humanistic studies. A "master of detail," he or she is capable of independent action in performance of technical activities and is frequently involved as a coordinator, expediter or supervisor of other technical personnel. His or her capability in technical sales and other public-contact positions is enhanced by his or her background in selected liberal studies.

The engineering technology graduate is qualified to select from a broad array of engineering-related positions. Job titles of engineering technology graduates include field engineer, test engineer, associate engineer, product engineer, sales engineer, tool designer, production engineer, engineering technologist, estimator, scheduler, and project engineer.

Those less intrigued with theoretical concepts but who have the interest and aptitude toward applications are likely engineering technology majors. These students particularly appreciate the engagement of technical specialty courses beginning with the first semester and continuing throughout the course of study. The relevance of the technical science and related technical courses adds further satisfaction.

The Division of Engineering Technology is offering opportunities for its students to minor in entrepreneurship. Usually, students will take two or three additional classes to get a minor in addition to his/her degree.

The Bachelor of Science in Engineering Technology program is composed of the following curricular subdivisions:

Mathematics and science—algebra, trigonometry, applied calculus, general physics, and chemistry or other science.
Technical specialty—technical science and related technical courses.
Communication—English composition, and written and oral technical communication.
Social sciences and humanities—history, government, religion, literature, art, music.
Electives—controlled and general.

Bachelor of Science in Engineering Technology Degree Programs

Construction Management Technology, 124 hours
Electrical Engineering Technology, 130 hours
Fire Protection and Safety Engineering Technology, 125 hours
Mechanical Engineering Technology, 121 hours

Master of Science in Engineering Technology Degree Programs

Fire Safety and Explosion Protection, 30 or 32 hours

Accreditation

Each Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org.

CO-OP Program

The College of Engineering, Architecture and Technology offers an experience-based program, Cooperative Education (Co-op). Co-op allows engineering technology students to achieve a balanced education through the combination of theoretical and practical knowledge during their early years of professional development. The student's education is a cooperative effort between the University and industry. Students alternate semesters on campus with work semesters in industry during their junior and senior years. The periods of employment constitute an essential element in the educational process. Students gain practical knowledge which is carried back to the classroom, giving academic programs a sense of reality. By the time they receive their degrees, students have accumulated the equivalent of a year-and-a-half of progressively challenging work experience.
Participation in Co-op is voluntary; transfer students must successfully complete at least one semester at OSU prior to their first placement. Students may obtain further information about the program from the coordinator, 101A Engineering North.

Transfer Students

An important, contemporary educational development is the "two-plus-two" bachelor's program. Those completing an associate degree in technology-oriented curricula at other institutions are generally admissible to the junior year with a minimum loss of academic time. The "two-plus-two" concept provides the attractive feature for students to obtain a four year undergraduate degree in engineering technology.

Required course work in mathematics and basic science is utilized to meet up to 18 semester hours of General Education requirements also. The Scientific Investigation requirement is met as a part of the course work meeting professional requirements for basic science.

Academic Areas

Construction Management Technology (p. 1465)

Electrical Engineering Technology (p. 1479)

Fire Protection and Safety Engineering Technology (p. 1485)

Mechanical Engineering Technology (p. 1506)

Faculty

Young Chang, PhD, PE, CFPS – Professor and Interim Head

Electrical and Computer Engineering

The School of Electrical and Computer Engineering is highly recognized throughout the nation for its student-centered, laboratory intensive curriculum, and is a partner of choice for employers seeking well educated, highly motivated, and uniquely creative college graduates dedicated to life-long learning. The School has devoted professors from prestigious universities who serve, instruct, and mentor undergraduate and graduate students pursuing B.S., M.S., or Ph.D. degrees in electrical engineering or a B.S. degree in computer engineering. Both the undergraduate Electrical Engineering and Computer Engineering Programs are accredited by ABET- the leading accreditor of engineering programs- to assure students, parents, industry partners, and other stakeholders that our programs are of the highest quality.

Electrical engineers and computer engineers have been at the center of the technological revolution that has occurred over the past 100 years. Marvels such as the transistor, radio, telephone, television, internet, microprocessor, computer, radar system, motor, wind generator, GPS, smart wireless device, laser, microwave oven, electric car, pace maker, and the flat panel display, to name only a handful, have resulted from the hard work and creative talents of electrical engineers and computer engineers. And since electricity and computers are essential in a modern society, the electrical engineer and the computer engineer will always be in high demand.

Electrical engineering encompasses many exciting subdisciplines including energy systems, machines, power electronics, analog electronics, digital electronics, mixed-signal electronics, VLSI chips, instrumentation, sensors, signal processing, machine vision, communications, control systems, robotics, wireless devices, electromagnetic fields, photonics, embedded controllers, networking, software development, biomedical devices, and computer architecture. The School encompasses all of these subdisciplines in its curriculum or research activities.

Computer Engineering is a relatively young engineering discipline that combines a strong foundation in electrical engineering with elements of computer science, including hardware and software integration, and design. Computer engineering includes digital logic design, computer architecture, digital data communications, computer and sensor interfacing, microprocessors, digital control, VLSI circuits and systems, operating and software systems, and computer arithmetic.

The School of Electrical and Computer Engineering (ECE) offers a full range of undergraduate and graduate program choices that allow students to excel in their careers. Moreover, a degree in electrical engineering or computer engineering is an excellent foundation for other professional fields such as medicine and law. Many graduates also pursue advanced programs in business and management after earning a degree in engineering.

Beyond creating technology, electrical and computer engineers of tomorrow must be aware of the social, economic, ethical and environmental impact of their respective technologies. They must also communicate effectively, possess excellent teamwork skills, and understand, perform, and complete the process of engineering design. The undergraduate programs in electrical engineering and computer engineering at Oklahoma State University equip graduates with these critical skills.

Program Educational Objectives

The Program Educational Objectives reflect the aspirational expectations for our electrical engineering and computer engineering graduates after they enter their professional careers. Specifically:

- Our Graduates will be widely employed across the range of subdisciplines within electrical engineering and computer engineering, and will be highly sought after by industrial, academic, non-profit, and governmental organizations.
- Our Graduates will compete in a technologically changing world, collaborate in a diverse workforce, and communicate effectively their knowledge and ideas to colleagues, employers, customers, and stakeholders.
- Our Graduates will be recognized leaders, team players, problem solvers, innovators, and entrepreneurs in their profession.
- Our Graduates will identify and contribute to solving grand-challenge problems that improve the lives of people in Oklahoma, the United States, and around the world, serving their communities and their profession to produce a lasting, significant, and positive impact.
- Our Graduates will abide by the highest ethical standards of professional practice in a technologically changing, professional environment.
- Our Graduates will continue to develop professionally throughout their lives by being adaptive learners with a never ending desire to assimilate new knowledge and embrace new technologies.
- Our Graduates will have the knowledge to earn professional registration or certification in their field or earn an advanced post-graduate or professional degree should they choose.
- Our Graduates will make a positive difference in the world.

Student Learning Outcomes

To support these Program Educational Objectives, the School has established Student Learning Outcomes that are regularly assessed and expected of all students upon completion of their chosen program in Electrical Engineering or Computer Engineering. These include:

a. an ability to apply knowledge of mathematics, science, and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. an ability to function on multidisciplinary teams
e. an ability to identify, formulate, and solve engineering problems
f. an understanding of professional and ethical responsibility
g. an ability to communicate effectively
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. a recognition of the need for, and an ability to engage in life-long learning
j. a knowledge of contemporary issues
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The undergraduate electrical engineering and computer engineering programs at Oklahoma State University prepare each graduate for a life-long professional career. During the first two years of study, students enter into Pre-Professional School and complete a carefully designed program consisting of mathematics, physics, chemistry, statics, introductory electrical and computer engineering courses, computer science, and selected courses in the humanities and social sciences. After successfully completing Pre-Professional school, students are admitted into Professional School and enroll in specific electrical engineering and/or computer engineering courses.

Electrical engineering and computer engineering students in Professional School obtain fundamental knowledge and technical skills needed by tomorrow's professionals. For electrical engineering students, these skills are learned in one of five areas of specialization that enable students to customize course choices to gain both a breadth of knowledge and a depth of understanding in a specific chosen area. These specializations areas include a) control systems, digital signal processing, and communication systems, b) energy and power, c) computer systems and digital electronics, d) analog electronics, and e) electromagnetics and optical science. Computer engineering students learn these skills by focusing on their own challenging specialized curriculum, which is also designed to provide breadth and depth within the discipline. Specialized computer engineering topics include microcontrollers, embedded controllers, computer architecture, computer mathematics, digital logic design, networking, cybersecurity, mobile computing, and digital electronics.

By tailoring the program to align student interests with faculty strengths, the School enhances faculty-student interactions to ensure academic excellence. All electrical engineering and computer engineering students receive multiple engineering design experiences throughout Professional School. Instructional laboratories are a central part of the curriculum to grant opportunities for hands-on experience in areas such as microcomputers, digital logic design, electronics, networks, instrumentation, optics, real-time digital signal processing, and electromagnetics.

Engineering design laboratories require students to solve open-ended problems in a manner that demonstrate the students' ability to apply fundamental concepts, creativity, and imagination, and to solve realistic problems of practical importance. These problems have several possible solutions; students must choose an acceptable approach and demonstrate that the desired outcomes have been met.

The capstone design experience is a two-course sequence typically taken during the student's last two semesters of the program that gives our students an opportunity to apply and demonstrate the skills that have developed throughout the program. These courses integrate theory analysis, simulation, design, and experimental skills the students have developed during their course of study. Teamwork, communication skills, and the complete engineering design process, from problem definition to prototype that includes both presentation and documentation, are emphasized.

Student teams receive individual project mentoring from an appropriate faculty member who provides project management and supervision. The capstone experience concludes with a formal public design demonstration, oral presentation, and written report. The new ECE Design Commons, an advanced design laboratory available to all students in electrical engineering and computer engineering, provides state-of-the-art capabilities for design, prototyping, testing and diagnostics of advanced hardware and software systems.

Undergraduate Programs

- Computer Engineering, BSCP (p. 1475)
- Electrical Engineering, BSEE (p. 1477)

Graduate Programs

The School of Electrical and Computer Engineering offers two graduate degrees, both in electrical engineering: Master of Science and Doctor of Philosophy. Specialized MS degree options in

1. control systems and
2. optics and photonics are also available, as are interdisciplinary graduate degrees in several specialties.

These graduate degree programs are flexible in course selection and emphasis.

The Master of Science degree emphasizes advanced mathematics, theory, design, and research. It is intended for students interested in cutting-edge careers or who want to prepare for advanced study associated with the PhD program. This degree combines course work with research that allows students to expand their knowledge in an in-depth area of electrical engineering or computer engineering.

The Doctor of Philosophy degree is designed to prepare students for high-level research and development positions in academia, industry and government and for the teaching profession in engineering. This degree is distinguished by an emphasis on research as documented in the doctoral dissertation.

Students typically select course work and participate in research and design projects in the following areas:

- Communication systems, cybersecurity, and networks
- Control systems, robotics, and mechatronics
- Analog, mixed-signal, and RF electronics
- Computer architecture, VLSI digital circuits, and arithmetic
- Electromagnetics and THz sciences
- Microcontrollers and embedded control
- Photonics and electro-optics
- Digital signal, image, and video processing
- Energy and power
- Bioengineering

Students may also select a multidisciplinary program that crosses departmental lines and emphasizes the application of electrical and computer engineering to complex problems. These applications serve to promote the interaction of engineering systems and technology with social, economic and environmental processes. Multidisciplinary opportunities exist in control systems and biomedical engineering.

Admission Requirements

Admission to the Graduate College, as described under "General Regulations" in the "Graduate College" section of the University Catalog is required. Graduation with high scholastic performance from an electrical engineering or computer engineering curriculum accredited by the ABET qualifies the student for admission to the School of Electrical and

Computer Engineering. A recent GRE score is also required as part of the application.

Graduates from non-engineering fields such as mathematics, physics and computer science are also admitted to the School of Electrical and Computer Engineering MS and PhD graduate programs if an evaluation of the applicant's official transcript indicates that the applicant is prepared to succeed in graduate-level course work in electrical and computer engineering, or can be expected to do so after a reasonable amount of remedial course work. This condition also applies to graduates of unaccredited engineering programs and engineering technology programs.

Degree Requirements

The Master of Science degree in Electrical Engineering (MSEE) is awarded to those students who successfully complete an approved plan of study. The degree requires 24 credit hours of course work plus 6 credit hours for the thesis. In addition to the thesis requirement, the plan of study requires, at a minimum, 18 hours of 5000-level courses in electrical and computer engineering. Most plans of study include additional 5000-level courses, depending upon the background and particular educational goals of the student. Each student is encouraged to include courses in supporting disciplines such as mathematics, physics, computer science, or other engineering fields. Additional remedial work in undergraduate electrical and computer engineering courses may be required for students who do not have a sufficient background in electrical engineering.

Students who wish to pursue a non-research, master's degree are encouraged to contact the Graduate Coordinator of the School of Electrical and Computer Engineering for more information.

The Doctor of Philosophy degree is granted to recognize high achievement in course work selected from the broad field of electrical and computer engineering. The degree is conferred on those who demonstrate the ability to perform independent research in a chosen field of specialization that generates new knowledge, as presented in a dissertation. For this degree the Graduate College requires a minimum of 90 credit hours for acceptable academic work beyond the bachelor's degree, including credit for the dissertation.

The School of Electrical and Computer Engineering also participates in several interdisciplinary degree programs. (See "Graduate Programs" under "Industrial Engineering and Management," and "Telecommunications Management" the "Graduate College" section of the Catalog.)

Master of Science in Engineering Technology Management

Tim Hardin, PhD—Director
Brenda L. Johnson, MS—Assistant Director

OSU's Master of Science in Engineering Technology Management is a rigorous degree program designed specifically for experienced engineers and scientists who are interested in accelerating their management careers. The curriculum combines academic coursework with the latest business practices and can be tailored to meet an individual student's needs. Managing today's global organizations requires a complex set of knowledge and skills. Effective planning, selection, implementation and management of technology, and the teams involved, is essential to the success of any business in today's time-critical, global markets. OSU-MSETM students learn to apply proven evaluation concepts and implementation strategies to fast moving, technical management decisions that make the difference in both career and business success. The MSETM program specifically addresses the real needs identified by industry leaders. The MSETM curriculum permits you to build a strong degree that directly addresses your needs and prepares you for the future. The degree consists of 32 credit hours. The MSETM program is provided by the OSU colleges of Engineering, Architecture and Technology; Arts and Sciences; and the Spears School of Business.

Admission Requirements

The guidelines for admission to the MSETM program are a bachelor's or higher degree, in engineering or the physical/mathematical sciences, with a 3.00 GPA, and at least four years' employment in a technical field since graduation with a bachelor's degree. Applicants not meeting these standards may be granted provisional admission based upon their overall academic and professional practice history and accomplishments. Since many course assignments are integrated into current issues in the work environment, students must be managing or employed in a technical organization in order to be successful in the program. For this reason, the program is not appropriate for full-time on-campus students. The MSETM student body is made up entirely of full-time employed, technical professionals who receive the courses through distance education technologies. An applicant must submit the following documents to the MSETM office:

1. an official OSU Application for Graduate Admission,
2. an official transcript of all academic work and degrees received,
3. an application fee ($40 domestic, $75 international),
4. MSETM program application,
5. a professional resume,
6. A statement of goals and objectives.

International applicants must also submit official results of the TOEFL with a minimum score of 89 IBT Application instructions can be found online at http://etm.okstate.edu.

Faculty

Jeffrey L. Young, PhD, PE—Professor and Head
Professor and OSURF Endowed Chair: Jeffrey L. Young, PhD, PE
Regents Professor and PSO/Albrecht Naeter Professor: Rama Ramakumar, PhD, PE
Regents Professors: Subhash Kak, PhD; Gary Yen, PhD
Associate Dean for CEAT Research, Professor and Henry Bellmon Chair: Charles F. Bunting, PhD
Cal and Marilyn Vogt Professor: Guoliang Fan, PhD
Earl and Carolyn Glimp Professor: James Stine, PhD
Professors: H. Jack Allison, PhD, PE (emeritus); Charles M. Bacon, PhD (emeritus); James E. Baker, PhD (emeritus); Richard L. Cummins, PhD (emeritus); PhD; Daniel R. Grischkowsky, PhD (emeritus); Martin T. Hagan, PhD, PE; Louis Johnson, PhD (emeritus); Jerzy S. Krasinski, PhD; Daqing Piao, PhD; Ronald P. Rhoten, PhD, PE (emeritus); Keith A. Teague, PhD, PE; James C. West, PhD; Rao Yarlagadda, PhD (emeritus); Weili Zhang, PhD
Associate Professors: Qi Cheng, PhD; Chriswell G. Hutchens, PhD, PE; Carl D. Latino, PhD; George Scheets, PhD (emeritus); Weihua Sheng, PhD
Assistant Professors: Sabit Ekin, PhD; Nishantha Ekneligoda, PhD; Yanmin Gong, PhD; Yuanxiong Guo, PhD; John O'Hara, PhD

Computer Engineering, BSCP

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 124

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
ENGL 1113	Composition I [1,2]	3
ENGL 3323	Technical Writing	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [2]	4
MATH 2153	Calculus II (A) [2]	3
MATH 2163	Calculus III [2]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1414	General Chemistry for Engineers (LN) [2]	4
or CHEM 1515	General Chemistry (LN)	
PHYS 2014	General Physics (LN) [2]	4
Social & Behavioral Sciences (S)		
Course designated (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2114	General Physics (LN) [2]	4
PHYS 3313	Introduction to Semiconductor Device Physics	3
Mathematics		
MATH 2233	Differential Equations [2]	3
Engineering		
ENGR 1111	Introduction to Engineering [2]	1
Engineering Science		
ENSC 3213	Computer Based Systems in Engineering [2]	3
Computer Science		
CS 1113	Computer Science I (A) [2]	3
CS 2133	Computer Science II [2]	3
CS 2351	Unix Programming	1
CS 3653	Discrete Mathematics for Computer Science	3
Electrical & Computer Engineering		
ECEN 2714	Fundamentals of Electric Circuits [2]	4
ECEN 3233	Digital Logic Design [2]	3
Hours Subtotal		31
Major Requirements		
Mathematics		
MATH 3013	Linear Algebra	3
Electrical & Computer Engineering [3]		
ECEN 3314	Electronic Devices and Applications	4
ECEN 3513	Signal Analysis	3
ECEN 3613	Electromagnetic Fields	3
ECEN 3714	Network Analysis	4
ECEN 4013	Design of Engineering Systems	3
ECEN 4024	Capstone Design	4
ECEN 4213	Embedded Computer Systems Design	3
ECEN 4243	Computer Architecture	3
ECEN 4303	Digital Integrated Circuit Design	3
ECEN 4503	Random Signals and Noise	3
Computer Science [3]		
CS 4323	Design and Implementation of Operating Systems I	3
CS 4343	Data Structures and Algorithm Analysis I	3
Industrial Engineering & Management		
IEM 3503	Engineering Economic Analysis	3
Electives [3]		
Select 3 hours selected from combinations on the departmentally approved list and approved by advisor		3
Hours Subtotal		48
Controlled Electives		
Select 3 hours of the following technical electives:		3
ENSC 2113	Statics	
ENSC 2123	Elementary Dynamics	
ENSC 2143	Strength of Materials	
ENSC 2213	Thermodynamics	
Engineering courses 3000 level and above		
Other courses such as MATH, CS, STAT, etc., may be approved by advisor		
Hours Subtotal		3
Total Hours		124

1. If a "B" or higher is not earned in ENGL 1113 Composition I, ENGL 1213 Composition II or ENGL 1413 Critical Analysis and Writing II is also required (per Academic Regulation 3.5 (p. 781)).
2. Courses that must be completed prior to admission to professional school.
3. A minimum GPA of 2.20 is required in all courses applied to Major Requirements indicated.

Other Requirements

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.00 is required in all courses applied to Major Requirements including ENGL 3323 Technical Writing, 3 hours of (S), and 6 hours of (H).
2. The major engineering design experience, capstone course, is satisfied by ECEN 4013 Design of Engineering Systems and ECEN 4024 Capstone Design.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Electrical Engineering, BSEE

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 123

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
ENGL 1113	Composition I [1, 2]	3
ENGL 3323	Technical Writing	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [2]	4
MATH 2153	Calculus II (A) [2]	3
MATH 2163	Calculus III [2]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1414	General Chemistry for Engineers (LN) [2]	4
or CHEM 1515	General Chemistry (LN)	
PHYS 2014	General Physics (LN) [2]	4
Social & Behavioral Sciences (S)		
Course designated (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2114	General Physics (LN) [2]	4
PHYS 3313	Introduction to Semiconductor Device Physics	3
Mathematics		
MATH 2233	Differential Equations [2]	3
Engineering		
ENGR 1111	Introduction to Engineering [2]	1
Engineering Science		
ENSC 2113	Statics [2]	3
ENSC 3213	Computer Based Systems in Engineering [2]	3
Computer Science		
CS 1113	Computer Science I (A) [2]	3
CS 2133	Computer Science II [2]	3
or CS 2433	C/C++ Programming	
Electrical & Computer Engineering		
ECEN 2714	Fundamentals of Electric Circuits [2]	4
ECEN 3233	Digital Logic Design [2]	3
Hours Subtotal		30
Major Requirements		
Mathematics		
MATH 3013	Linear Algebra	3
Electrical & Computer Engineering [3]		
ECEN 3314	Electronic Devices and Applications	4
ECEN 3513	Signal Analysis	3
ECEN 3714	Network Analysis	4
ECEN 4013	Design of Engineering Systems	3
ECEN 4024	Capstone Design	4
ECEN 4503	Random Signals and Noise	3
Industrial Engineering & Management [3]		
IEM 3503	Engineering Economic Analysis	3
ECEN Junior Electives [3]		
Select two of the following based on combinations from the departmentally approved list, and with advisor approval:		6
ECEN 3113	Energy, Environment and Economics	
ECEN 3613	Electromagnetic Fields	
ECEN 3723	Systems I	
ECEN 3913	Solid State Electronic Devices	
ECEN Electives [3]		
Select five ECEN or other courses selected from combinations on the departmentally approved list, including optionally one or more courses listed, but not taken, from the ECEN Junior Elective list above, and with advisor approval		15
Hours Subtotal		48
Controlled Electives		
Select 3 hours of the following technical electives:		3
ENSC 2123	Elementary Dynamics	
ENSC 2143	Strength of Materials	
ENSC 2213	Thermodynamics	
Engineering courses 3000 level and above		
Other courses such as MATH, CS, STAT, etc., may be approved by advisor		
Hours Subtotal		3
Total Hours		123

1. If a "B" or higher is not earned in ENGL 1113 Composition I, ENGL 1213 Composition II or ENGL 1413 Critical Analysis and Writing II is also required (per Academic Regulation 3.5 (p. 784)).
2. Courses that must be completed prior to admission to professional school.
3. A minimum GPA of 2.20 is required in all courses applied to Major Requirements.

Other Requirements

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.00 is required in all courses applied to Major Requirements including ENGL 3323 Technical Writing, 3 hours of (S), and 6 hours of (H).
2. The major engineering design experience, capstone course, is satisfied by ECEN 4013 Design of Engineering Systems and ECEN 4024 Capstone Design.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Electrical Engineering Technology

The electrical engineering technology (EET) curriculum provides preparation for outstanding career opportunities not only in the electronics industry itself, but also in many other areas in modern industry that depend upon electronics for control, communications or computation. Outstanding opportunities exist for graduates to work in diverse areas of electronics and computers.

The work of an electrical engineering technology graduate may range from assisting in the design and development of new equipment in the laboratory, applying modern microprocessors in the field, to the operation or supervision of production operations or field representatives.

The program offers the Bachelor of Science in Engineering Technology degree with a major in Electrical Engineering Technology. An option in computers is also available. To meet diverse needs, the program is laboratory-oriented and provides a strong foundation of specialized mathematics and science courses in applied electrical engineering and related technical areas, as well as courses in the area of communications, humanities, and the social sciences.

Program Educational Objectives

OSU Electrical Engineering Technology graduates a few years after graduation will:

- Be employed in a technical or management position where the skills and knowledge of applied electrical engineering are utilized.
- Continue life-long learning and professional growth through participation and membership in professional organizations and/or through the continuation of professional studies.
- Work proactively and productively in teams and communicate effectively in written, oral and graphical forms.
- Successfully apply mathematical, analytical and technical expertise to industrial problems

Electrical Engineering Technology graduates can expect to obtain these student outcomes upon graduation:

(a) an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;

(b) an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

(c) an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

(d) an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;

(e) an ability to function effectively as a member or leader on a technical team;

(f) an ability to identify, analyze, and solve broadly-defined engineering technology problems;

(g) an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

(h) an understanding of the need for and an ability to engage in self-directed continuing professional development;

(i) an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;

(j) a knowledge of the impact of engineering technology solutions in a societal and global context;

(k) a commitment to quality, timeliness, and continuous improvement;

(l) should have knowledge and hands-on competence in the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering standards to the building, testing, operation, and maintenance of electrical/electronic(s) systems;

(m) the applications of physics or chemistry to electrical/electronic(s) circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry;

(n) the ability to analyze, design, and implement control systems, instrumentation systems, communications systems, computer systems, or power systems;

(o) the ability to apply project management techniques to electrical/electronic(s) systems, and

(p) the ability to utilize statistics/probability, transform methods, discrete mathematics, or applied differential equations in support of electrical/electronic(s) systems.

The Electrical Engineering Technology major provides graduates the ability to enter the many dynamic fields of the electrical engineering world. The demand for graduates having electronic and electrical engineering design and application skills remains important and relevant. Graduates of this program will be prepared for a wide range of opportunities for employment in an industry that requires considerable knowledge of the electrical engineering profession.

The Electrical Engineering Technology–Computer option curriculum provides the preparation for graduates to enter the growing field of computer hardware and software engineering. The demand for graduates having both computer hardware and software skills is quickly developing as the importance of automation, robotics, and artificial intelligence is recognized. Graduates of this program will be prepared for these opportunities in industry that require considerable knowledge of both computer hardware and software engineering skills.

The Electrical Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of the ABET, http://www.abet.org.

Undergraduate Programs

- Electrical Engineering Technology, BSET (p. 1481)
- Electrical Engineering Technology: Computer, BSET (p. 1482)

Faculty

Imad Abouzahr, PhD, PE—Associate Professor and Program Coordinator
Associate Professor: Brian Norton, MS, PE

Assistant Professors: Avimanyu Sahoo, PhD; Ellis C. Nuckolls, MS, PE

Electrical Engineering Technology, BSET

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 130

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1715	Precalculus (A)	5
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
PHYS 1114	General Physics (LN)	4
Select 4 hours of any course designated (L), (N)		4
Social & Behavioral Sciences (S)		
SPCH 2713	Introduction to Speech Communication (S)	3
Any course designated (S)		3
Additional General Education		
Any Foreign Language, Speech, any course from the Spears School of Business, any course designate (H), (D), (S), or (I)		3
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Mathematics		
MATH 2123	Calculus for Technology Programs I (A)	3
MATH 2133	Calculus for Technology Programs II (A)	3
Natural Science		
PHYS 1214	General Physics (LN)	4
Electronics		
EET 1104	Fundamentals of Electricity	4
EET 1244	Circuit Analysis I	4
EET 2303	Technical Programming	3
EET 2544	Pulse and Digital Techniques	4
EET 2635	Solid State Devices and Circuits	5
Hours Subtotal		30
Major Requirements		
EET 3113	Circuit Analysis II	3
EET 3124	Project Design and Fabrication	4
EET 3254	Microprocessors I	4
EET 3264	Microprocessors II	4
EET 3354	Communication and Signal Processing	4
EET 3363	Data Acquisition	3
EET 3524	Advanced Logic Circuits	4
EET 3533	Introduction to Telecommunications	3
EET 4314	Elements of Control	4
EET 4363	Digital Signal Processing	3
EET 4654	Microwave Techniques	4
EET 4833	Industrial Project Design I	3
EET 4843	Industrial Project Design II	3
GENT 3123	Applied Analysis for Technology	3
MGMT 3013	Fundamentals of Management (S)	3
or IEM 3503	Engineering Economic Analysis	
STAT 4033	Engineering Statistics	3
or STAT 4013	Statistical Methods I (A)	
Select 5 hours from any math, science, engineering or technology course		5
Hours Subtotal		60
Total Hours		130

Graduation Requirements

1. A minimum GPA of 2.00 is required in all courses with an EET, CHEM, MATH, or PHYS prefix. are satisfied.
2. A minimum grade of 'C' is required in each course that is a prerequisite to a required course.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Electrical Engineering Technology: Computer, BSET

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 130

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 1715	Precalculus (A)	5
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
PHYS 1114	General Physics (LN)	4
Select 4 hours of any course designated (L), (N)		4
Social & Behavioral Sciences (S)		
SPCH 2713	Introduction to Speech Communication (S)	3
Any course designated (S)		3
Additional General Education		
Any Foreign Language, Speech, any course from the Spears School of Business, any course designate (H), (D), (S), or (I)		3
Hours Subtotal		40
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Mathematics		
MATH 2123	Calculus for Technology Programs I (A)	3
MATH 2133	Calculus for Technology Programs II (A)	3
Natural Science		
PHYS 1214	General Physics (LN)	4
Electronics		
CS 1113	Computer Science I (A)	3
EET 1104	Fundamentals of Electricity	4
EET 1244	Circuit Analysis I	4
EET 2303	Technical Programming	3
EET 2544	Pulse and Digital Techniques	4
EET 2635	Solid State Devices and Circuits	5
Hours Subtotal		33
Major Requirements		
EET 3113	Circuit Analysis II	3
EET 3124	Project Design and Fabrication	4
EET 3254	Microprocessors I	4
EET 3264	Microprocessors II	4
EET 3354	Communication and Signal Processing	4
EET 3363	Data Acquisition	3
EET 3524	Advanced Logic Circuits	4
EET 3533	Introduction to Telecommunications	3
EET 4363	Digital Signal Processing	3
EET 4833	Industrial Project Design I	3
EET 4843	Industrial Project Design II	3
GENT 3123	Applied Analysis for Technology	3
MGMT 3013	Fundamentals of Management (S)	3
or IEM 3503	Engineering Economic Analysis	
STAT 4033	Engineering Statistics	3
or STAT 4013	Statistical Methods I (A)	
Select 2 hours from any math, science, engineering or technology course		2
CS 2133	Computer Science II	3
Select 5 hours of upper-division CS		5
Hours Subtotal		57
Total Hours		130

Graduation Requirements

1. A minimum GPA of 2.00 is required in all courses with an EET, CHEM, MATH, or PHYS prefix.
2. A minimum grade of 'C' is required in each course that is a prerequisite to a required course.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Engineering Dean's office and CEAT Distance Education

Undergraduate Programs

- Nuclear Engineering (NENG), Minor (p. 1484)

Nuclear Engineering (NENG), Minor

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Randy Seitsinger, randy.seitsinger@okstate.edu, 201 ARTC, 405-744-5140

Minimum Overall Grade Point Average: 2.50 with a grade of "C" or better in each course submitted for the minor
Total Hours: 20-22 hours

Code	Title	Hours
Minor Requirements		
ENGR 4213	Elements of Nuclear Engineering	3
Select 3 hours of the following:		3
ENGR 4211	Introduction to Nuclear and Radiation Engineering Concepts	
ENGR 4201	Principles of Nuclear Engineering	
ENGR 4203	Nuclear Technologies in Society: Fulfilling Madame Curie's Dream	
Select a minor track (p. 1484)		9

Minor Tracks

Nuclear Energy Systems Track

Code	Title	Hours
Select nine hours of the following:		9
ENGR 4233	Energy Systems and Resources	
ENGR 4243	Radiation Protection and Shielding	
ENGR 4223	Nuclear Reactor Engineering	
ENGR 4273	Probabilistic Risk Assessment	

Nuclear Reactor Theory Track

Code	Title	Hours
Select nine hours of the following:		9
ENGR 4243	Radiation Protection and Shielding	
ENGR 4263	Nuclear Reactor Theory	
ENGR 4253	Nuclear Reactor Analysis	

Additional OSU Requirements

Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf).

Fire Protection and Safety Engineering Technology

The fire protection and safety engineering technology (FPST) curriculum provides preparation for assessing and reducing the loss potential with respect to fire, safety, industrial hygiene, and hazardous material incidents. With respect to fire, reducing the loss potential might involve setting design criteria with a special emphasis on life safety or fire resistivity or specifying automatic detection or extinguishing systems. When considering safety, reducing accidents may require special protective equipment or clothing, or the redesign of machinery or processes. Reducing losses caused by environmental problems may require sampling air for contaminants, such as asbestos or toxic chemicals, or monitoring noise levels, and the development of procedures to address practical approaches to compliance with state and federal regulations. Addressing the problems of handling and disposing of hazardous chemicals, such as spill control, is often required. Managing risk and compliance with federal laws and regulations relative to occupational safety and health and hazardous materials is an increasingly important job activity

The fire protection and safety engineering technology program began at Oklahoma State University in 1937 - which is the oldest fire related program in North America. The demand by business and industry for loss control specialists has resulted in the evolution of the program into one that now places emphasis on fire protection, safety, and occupational/environmental health. The FPST program prepares graduates for careers in loss control. The loss control profession is segmented into three major areas: loss from fire, loss from physical accidents, and loss from environmental exposure.

The curriculum is designed to immediately introduce the student to studies in fire protection and safety. Therefore, students are able to measure their interest in a fire protection and safety career early in their academic program. The curriculum is rigorous in the areas of mathematics and the physical sciences. Two semesters of calculus are required as well as two semesters of chemistry and one semester of physics. Computer usage is an essential component of most fire protection and safety courses. Interested high school students should design their high school programs to prepare themselves for college level mathematics and science classes.

The program concludes with the Bachelor of Science in Engineering Technology degree in Fire Protection and Safety Engineering Technology.

Program Educational Objectives

OSU Fire Protection and Safety graduates a few years after graduation will be:

1. Earning and pursuing personal, technical and professional advancement through their employment.
2. Continuing the pursuit of life-long learning through membership and participation in professional organizations.
3. Developing business expertise within their selected employment organization.
4. Successfully applying mathematical, analytical, and technical skills to solve complex problems in the selected field.
5. Meeting the highest standards of ethical practice in their profession.

Fire Protection and Safety Technology degree graduates can expect to obtain these student outcomes upon graduation:

1. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
2. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
3. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
4. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
5. an ability to function effectively as a member or leader on a technical team;
6. an ability to identify, analyze, and solve broadly-defined engineering technology problems;
7. an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature;
8. an understanding of the need for and an ability to engage in self-directed continuing professional development;
9. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
10. a knowledge of the impact of engineering technology solutions in a societal and global context;
11. and a commitment to quality, timeliness, and continuous improvement.

The graduates of the fire protection and safety engineering technology program at Oklahoma State University are consistently recruited by the major businesses and industries of the United States. Graduate placement, salary offers, and advancement into managerial positions have been excellent due to the uniqueness and high technical quality of the OSU fire protection and safety engineering technology program.

The Fire Protection and Safety Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org.

Undergraduate Programs

- Fire Protection and Safety Engineering Technology, BSET (p. 1487)
- Fire Suppression and Emergency Operations (FSEO), Minor (p. 1489)
- Homeland Security Science and Technology (HSST), Minor (p. 1490)
- Safety and Exposure Sciences (SAES), Minor (p. 1491)

Graduate Programs

The Fire Protection and Safety Engineering Technology (FPST) program offers a graduate program leading to the Master of Science in Engineering Technology with an option in Fire Safety and Explosion Protection (FSEP). The program extends the FPST undergraduate program into graduate research, scholarship, and creative activities. The FSEP program is designed to prepare students for professional practice that may include research or consulting components, with major emphasis in fields of interest such as fire protection engineering, explosion protection, fire and explosion hazards, and process safety. This

is the nation's only master's degree program that is dedicated to both fire and explosion protection and related to safety. The program is geared toward recent graduates and professionals in a variety of industries, including insurance companies, the oil & gas industry, fire protection engineering companies. The graduates of this program will have the deeper knowledge base that is needed to safeguard people in Oklahoma, the nation, and world. The FSEP program is intended to be especially attractive to engineering and engineering technology graduates from any disciplines, and many science majors. The program is interdisciplinary in nature and hence students with undergraduate degrees in fire and safety related fields or other STEM disciplines are invited to apply for admission. Students can complete degree requirements either online as distance students or as a resident on campus.

Admission Requirements. Admission to the Master of Science degree program requires a B.S. degree in engineering or engineering technology from an ABET accredited (or equivalent) program. Alternately, B.S. students from other related disciplines may also be considered. Admission is competitive based on undergraduate GPA and TOEFL (for international students), statement of interests, experience and recommendations.

Degree Requirements. A candidate for the graduate degree must satisfy at least the minimum University requirements for that particular degree. The program consists of 30 hours of course work with a thesis option or 32 hours of course work with a non-thesis option. For both options, the courses taken must include GENT 5013, 5023, 5033 and FSEP 5113, 5133, 5143.

Faculty

Qingsheng Wang, PhD, PE, CSP—Associate Professor and Program Coordinator
Associate Professor and Dale F. Janes Endowed Professorship: Qingsheng Wang, PhD, PE, CSP
Assistant Professors: Robert Agnew, MS, CSP, CIH; Virginia Charter, MS, PE; Bryan Hoskins, PhD; Jarrett Metheny, MS; Haejun Park, PhD; Leslie Stockel, MS, CSP
Assistant Dean, CEAT Outreach & Extension and Adjunct Assistant Professor: Ed Kirtley, MS

Fire Protection and Safety Engineering Technology, BSET

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 125

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan.		
English Composition		
See Academic Regulation 3.5 (p. 784)		
Select one of the following:		3
ENGL 1113	Composition I	
ENGL 1123	International Freshman Composition I	
ENGL 1313	Critical Analysis and Writing I	
ENGL 3323	Technical Writing	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2123	Calculus for Technology Programs I (A)	3
or MATH 2144	Calculus I (A)	
MATH 2133	Calculus for Technology Programs II (A)	3
or MATH 2153	Calculus II (A)	
Select one of the following:		3
MATH 3263	Linear Algebra and Differential Equations	
MATH 3013	Linear Algebra	
MATH 2233	Differential Equations	
STAT 3013	Intermediate Statistical Analysis	
STAT 4033	Engineering Statistics	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1414	General Chemistry for Engineers (LN)	
CHEM 1314 & CHEM 1515	General Chemistry (LN) and General Chemistry (LN)	
CHEM 1215 & CHEM 1225	General Chemistry (LN) and General Chemistry (LN)	
PHYS 1114	General Physics (LN)	4
or PHYS 2014	General Physics (LN)	
Social & Behavioral Sciences (S)		
Course designated (S)		6
Additional General Education		
Courses designated (A) or (N)		3
Hours Subtotal		44
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Engineering		
Select one of the following:		2
ENGR 1322	Engineering Design with CAD	
ENGR 1332	Engineering Design with CAD for MAE	
ENGR 1342	Engineering Design with CAD for ECEN	
ENGR 1352	Engineering Design with CAD for CHE	
GENT 1153	Engineering Graphics	
CMT 2203	Construction Drawings (for non-majors)	
Engineering Science		
ENSC 2113	Statics	3
or GENT 2323	Statics	
Select one of the following:		3
ENSC 2213	Thermodynamics	
GENT 3433	Basic Thermodynamics	
GENT 4433	Heat Transfer	
Select one of the following:		3
ENSC 2613	Introduction to Electrical Science	
PHYS 1214	General Physics (LN)	
PHYS 2114	General Physics (LN)	
Specialty		
FPST 1213	Fire Safety Hazards Recognition	3
FPST 1373	Fire Suppression and Detection Systems	3
FPST 2023	Introduction to Occupational Safety Techniques	3
FPST 2243	Design and Analysis of Sprinkler Systems	3
FPST 2344	Elements of Industrial Hygiene	4
FPST 2483	Fire Protection Hydraulics and Water Supply Analysis	3
Hours Subtotal		30
Major Requirements		
Select one of the following:		3
CHEM 3013	The Chemistry of Organic Compounds	
CHEM 3015	The Chemistry of Organic Compounds	
GENT 3323	Strength of Materials	
ENSC 2143	Strength of Materials	
ENSC 3313	Materials Science	
Select one of the following:		3
STAT 2013	Elementary Statistics (A)	
STAT 4013	Statistical Methods I (A)	
STAT 4033	Engineering Statistics	
MGMT 3013	Fundamentals of Management (S)	3
or IEM 4413	Industrial Organization Management	
IEM 3503	Engineering Economic Analysis	3
or IEM 3513	Economic Decision Analysis	
FPST 3013	Safety Management	3
FPST 3143	Structural Designs for Fire and Life Safety	3

FPST 3213	Human Factors in Accident Prevention	3
FPST 3373	Fire Dynamics	3
FPST 4143	Industrial Ventilation and Smoke Control	3
FPST 4333	System and Process Safety Analysis	3
FPST 4403	Hazardous Materials Incident Management	3
FPST 4683	Industrial Loss Prevention	3
FPST 4993	Advanced Fire and Safety Problems	3
Select 6 hours of specialty electives of the following:		6
AVED 4113	Aviation Safety	
CIVE 3813	Environmental Engineering Science	
CMT 4443	Construction Safety and Loss Control	
ECON 3903	Economics of the Environment	
EET 1003	Introduction to Microcomputer Programming	
ENGR 1412	Introductory Engineering Computer Programming	
ENGR 4123	Tort and Products Liability Law for Technical Professionals (S)	
HLTH 2323	Drugs and Society	
HLTH 2603	Total Wellness (S)	
MET 3313	Applied Fluid Mechanics	
PETE 4303	Petroleum Rock and Fluids	
PETE 4313	Drilling and Well Completions	
PETE 4333	Production Operations	
PETE 4343	Reservoir Engineering and Well Testing	
NREM 3713	Wildland Fire Ecology and Management	
POLS 3733	Emergency Management: Preparedness and Response	
POLS 3813	Introduction to Emergency Management	
POLS 3893	Terrorism and Emergency Management	
POLS 4363	Environmental Law And Policy	
POLS 4403	Urban Politics and Management	
FPST and FSEP courses not used elsewhere		
ENSC courses not used elsewhere		
Hours Subtotal		45
Electives		
Select 6 hours of upper-division controlled electives of the following:		6
AVED 4113	Aviation Safety	
AVED 4413	Aviation Terrorism and Asymmetrical Warfare	
AVED 4423	Aviation Security Organizations and Law	
AVED 4433	Airport Safety Inspections	
AVED 4943	Basic Aircraft Accident Investigation	
AVED 4983	Aerospace Industry Hazardous Materials or Dangerous Goods	
BCOM		
BIOC		
BIOL		
CHEM		
CS		
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior	
EEE 4483	Entrepreneurship and New Technologies	
Engineering		
ENSC		
FSEP		
GEOL 3413	Petroleum Geology for Engineers	
GEOL 4323	Applied Well Log Analysis for Engineers	
HESA 3013	Leadership Concepts (S)	
LSB		
MATH (except MATH 3403 or MATH 3603)		
MGMT (except MGMT 3943)		
MSIS 4123	Information Assurance Management	
MSIS 4233	Applied Information Systems Security	
NREM 3713	Wildland Fire Ecology and Management	
PETE		
PHYS		
POLS 3733	Emergency Management: Preparedness and Response	
POLS 3813	Introduction to Emergency Management	
POLS 3893	Terrorism and Emergency Management	
POLS 4363	Environmental Law And Policy	
POLS 4403	Urban Politics and Management	
POLS 5343	Seminar in Fire and Emergency Services Administration.	
POLS 5633	Practical Environmental Compliance	
STAT		
SPCH 3733	Elements of Persuasion (S)	
POLS 5643	Regulatory Risk Analysis	
Technology		
Hours Subtotal		6
Total Hours		125

Graduation Requirements

1. A grade of 'C' or better is required in each course that is a prerequisite to a required course that has an engineering or engineering technology prefix.
2. A minimum overall GPA of 2.5 is required in all courses that are used in this degree plan with engineering or engineering technology prefixes.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Fire Suppression and Emergency Operations (FSEO), Minor

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Qingsheng Wang, qingsheng.wang@okstate.edu, 499 Cordell South, 405-744-5721

Total Hours: 21 hours

Code	Title	Hours
Minor Requirements		
FPST 1103	Applied Techniques in Fire Suppression	3
FPST 1203	Applied Techniques in Emergency Operations	3
FPST 1213	Fire Safety Hazards Recognition	3
FPST 1373	Fire Suppression and Detection Systems	3
FPST 2023	Introduction to Occupational Safety Techniques	3
FPST 4403	Hazardous Materials Incident Management	3
NREM 3713	Wildland Fire Ecology and Management	3

Additional OSU Requirements

Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf).

Homeland Security Science and Technology (HSST), Minor

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

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Total Hours: 22 hours

Code	Title	Hours
Minor Requirements		
ENTO 2143	Global Issues in Agricultural Biosecurity and Forensics	3
or PLP 2143	Global Issues in Agricultural Biosecurity and Forensics	
FPST 2344	Elements of Industrial Hygiene	4
POLS 3313	Politics Of The Middle East	3
POLS 3893	Terrorism and Emergency Management	3
AVED 4413	Aviation Terrorism and Asymmetrical Warfare	3
MSIS 4233	Applied Information Systems Security	3
Select 3 hours of the following:		3
FPST 4403	Hazardous Materials Incident Management	
CIVE 3813	Environmental Engineering Science	
ENGR 4133	Environmental Regulation for Technical Professionals (S)	

Additional OSU Requirements

Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf).

Safety and Exposure Sciences (SAES), Minor

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

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Minimum Overall Grade Point Average:
Total Hours: 22 hours

Code	Title	Hours
Minor Requirements		
FPST 1213	Fire Safety Hazards Recognition	3
FPST 2023	Introduction to Occupational Safety Techniques	3
FPST 2344	Elements of Industrial Hygiene	4
Select 12 hours of the following:		12
FPST 3013	Safety Management	
FPST 3213	Human Factors in Accident Prevention	
FPST 4143	Industrial Ventilation and Smoke Control	
FPST 4233	Advance Exposure Assessment	
ENGR 4123	Tort and Products Liability Law for Technical Professionals (S)	
AVED 4943	Basic Aircraft Accident Investigation	
CIVE 3813	Environmental Engineering Science	
AVED 4113	Aviation Safety	
CMT 4443	Construction Safety and Loss Control	
AVED 3243	Human Factors in Aviation	
ENGR 4133	Environmental Regulation for Technical Professionals (S)	
ENGR 4203	Nuclear Technologies in Society: Fulfilling Madame Curie's Dream	

Additional OSU Requirements

Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf).

Industrial Engineering and Management

Industrial engineering and management focuses on production systems that produce goods or provide services for customers. Industrial engineers define, design, build, operate, and improve production processes that convert resources to high quality products or services effectively, efficiently, and safely.

People are the fundamental component of production systems. People provide the creativity and leadership essential to make things happen. Hence, industrial engineering is the most people-oriented discipline within the engineering family. Industrial engineers are trained to think in both broad and specific terms. Practicing industrial engineers understand business parameters as well as physical and social parameters within production systems. This breadth allows industrial engineers to function effectively in a wide spectrum of activities ranging from strategic business planning to detailed task design. The wide-angle vision of industrial engineering provides career flexibility, leading to high-level leadership or specialized technical responsibilities.

Industrial engineers are found in manufacturing organizations (e.g., automotive, electronics, medical, and food manufacturers), service enterprises (e.g., hospitals, banks, airlines, and consulting groups), and governmental organizations (e.g., public service and regulatory organizations).

Vision

IEM's vision is to place industrial engineers in a wide variety of industries including manufacturing, service, energy, healthcare, humanitarian, and others, so that our society at large can benefit from systems that efficiently produce goods or provide services, effectively use an optimal set of resources, and enrich the quality of life for all.

Mission

The School of Industrial Engineering and Management's mission is to develop professionals and leaders in industrial engineering and management by being a leader in education, research, and outreach.

Core Values

Faculty, students, and staff work together to build and maintain a learning/mentoring environment where:

- Innovative practices are developed, tested, and validated.
- Knowledge and practices are shared.
- Each individual develops to his/her full potential.
- Professional ethics are practiced at all times.

Educational Objectives and Outcomes

Within a few years after graduation, Industrial Engineering program graduates will become professionals, managers or leaders in a wide variety of industries and apply discovery, problem solving, leadership, and management skills for the benefit of their organization and society at large.

Student Learning Outcomes

Graduating baccalaureate students possess an understanding of fundamental industrial engineering and management concepts, methodologies and technologies as demonstrated by:

- an ability to apply knowledge of mathematics, probability and statistics, science, engineering.
- an ability to design and conduct experiments involving risk and uncertainty, as well as to analyze and interpret data.
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- an ability to function on multi-disciplinary teams.
- an ability to identify, formulate and solve engineering problems.
- an understanding of professional and ethical responsibility.
- an ability to communicate effectively.
- the broad education necessary to understand the impact of engineering solutions in a global economic, environmental and societal context.
- a recognition of the need for, and an ability to engage in, life-long learning.
- a knowledge of contemporary issues.
- an ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

The curriculum consists of three primary parts:

1. general studies,
2. core engineering, and
3. professional school topics.

General studies consist of courses such as mathematics, statistics, chemistry, physics, English, behavioral science, history, humanities, and arts. Core engineering courses consist of engineering sciences such as materials, statics, electrical circuits, fluid mechanics, and thermodynamics. Professional school courses consist of topics such as systems thinking and analysis in engineering, economic analysis, manufacturing processes, computer-aided modeling, work analysis, operations research, quality control, experimental design, facility location and layout, management and leadership, production control, system simulation modeling, information systems, ergonomics and human factors, and energy and water management. A capstone design experience, working with a real-world organization, integrates classroom and lab work together in the senior year. Details regarding degree requirements are available in the Undergraduate Programs and Requirements publication.

The IEM program is accredited by the Engineering Accreditation Commission of the ABET under the industrial engineering criteria.

Each IEM student, along with the faculty adviser, develops an individual plan of study that guides the student through the curriculum. Course work is sequenced and interrelated to provide theoretical and applied knowledge, along with hands-on laboratory and project experience. Students work as individuals and as teams to integrate and apply mathematical, scientific, and engineering knowledge and concepts in order to address both traditional academic questions as well as open-ended design and analysis challenges. Instruction in experimental methods is integrated in the curriculum through the design, execution, analysis and interpretation of experiments. Project work is used to develop both technical and communications skills. Technical skills are used to identify, formulate and address engineering problems, both simple and complex. Communications skills are developed and practiced in written, oral and team interaction formats.

The means to define and design detailed solutions to address customer needs from a system-wide perspective is introduced in the sophomore year, and reinforced through the capstone senior design project. Additionally, global perspectives or production systems are introduced and emphasized in the sophomore year so that students understand the nature of global customer bases as well as global competition early in their studies. The curriculum is continually updated to assure that contemporary issues, thinking, and tools are integrated in course content as well as instructional delivery. Professional responsibility and ethical behavior are introduced and reinforced throughout the curriculum. Additionally, the need for life-long learning after graduation is stressed.

Students are offered opportunities to enhance their classroom and laboratory experiences through student organizations such as the student chapter of the Institute of Industrial and Systems Engineers, the Institute for Operation Research and the Management Sciences, and the American Society for Quality. Outstanding scholars are recognized by Alpha Pi Mu, the national honor society for industrial engineering students. Additionally, opportunities for internship and co-op experiences are offered to IEM students so that they can gain professional experience during their collegiate program. Please visit our Internet site http://iem.okstate.edu for more information.

Undergraduate Programs

- Industrial Engineering and Management, BSIE (p. 1494)

Graduate Programs

The School of Industrial Engineering and Management offers graduate programs leading to the Master of Science Industrial Engineering and Management degree and the Doctor of Philosophy degree.

The Master of Science degree is characterized by a higher degree of technical specialization in a particular field of study (beyond a BS degree). This degree program is designed to prepare students for professional practice that may include research or consulting components. The Master of Science degree is especially attractive to industrial engineering graduates, engineering graduates from other disciplines, and many science majors. The MS degree includes a strong technical component and an orientation to business and engineering management that is complementary to a technical background.

The Doctor of Philosophy degree is designed to position the student on the leading edge of knowledge in the profession of industrial engineering and engineering management. It is intended to prepare students for highly specialized positions, such as research and consulting in industry, government and service organizations, and for teaching or research positions in colleges and universities.

The basic consideration in graduate education in industrial engineering and management is effective and efficient utilization of human, physical, and economic resources. Instruction in management embraces both qualitative and quantitative concepts, including analytical methodologies and social considerations pertinent to organizations.

Advanced degree programs are designed with major emphasis in fields of interest such as engineering management, manufacturing systems, operations research, quality and reliability, facilities and energy-management, and enterprise systems and supply chains. Students may complement industrial engineering and management courses with work in other branches of engineering, as well as economics, business administration, computer science, statistics, mathematics, psychology, and sociology.

Admission Requirements

Admission to the Graduate College is required of all students pursuing the MS or PhD degree. Graduation from an industrial engineering curriculum with scholastic performance distinctly above average qualifies the student for admission to the School of Industrial Engineering and Management as a candidate for the master's and doctorate degrees. Graduates from related disciplines may be admitted if an evaluation of their transcripts and other supporting materials by the School of Industrial Engineering and Management indicates that they are prepared to take graduate-level course work in industrial engineering, or can be expected to do so after a reasonable amount of prerequisite work.

All applicants must submit GRE scores (minimum 145 in Verbal Reasoning and 158 in Quantitative Reasoning). In addition, the Graduate College may require certain international applicants to submit TOEFL scores.

Degree Requirements

The Master of Science degree in industrial engineering and management requires the completion of at least 30 credit hours beyond the bachelor's degree, including a research thesis of six credit hours. A 33 semester-credit-hour option is also permitted and must include a three credit-hour creative component. The creative component requirement can be met by completing a three credit-hour independent study project or a three credit-hour course approved by the student's committee.

The Doctor of Philosophy degree requires the completion of at least 90 credit hours beyond the bachelor's degree or 60 credit hours beyond the master's degree; including a minimum of 18 credit hours of dissertation research and a minimum of 30 credit hours of course work beyond the master's degree.

The School of Industrial Engineering and Management also participates in the Master of Science in Engineering and Technology Management program. Current IE&M program information can be found on the School website http://iem.okstate.edu.

Faculty

Sunderesh S. Heragu, PhD—Regents Professor and Head
Professor and Donald and Cathey Humphreys Chair: Sunderesh S. Heragu, PhD
Professor and Wilson Bentley Chair: William J. Kolarik, PhD
Professor: Manjunath Kamath, PhD
Associate Professors: Balabhaskar Balasundaram, PhD; Terry Collins, PhD, PE; Camille F. DeYong, PhD; Tieming Liu, PhD
Assistant Professor and Jim and Lynne Williams Chair: Chaoyue Zhao, PhD
Assistant Professors: Juan Borrero, PhD; Austin Buchanan, PhD; Kalyani Nagaraj, PhD; Farzad Yousefian, PhD
Lecturers: Tim Hardin, PhD; Jennifer Glenn, PhD

Industrial Engineering and Management, BSIE

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 126

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
ENGL 1113	Composition I [1, 2]	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 3323	Technical Writing	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [2]	4
MATH 2153	Calculus II (A) [2]	3
MATH 2163	Calculus III [2]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1414	General Chemistry for Engineers (LN) [2]	4
PHYS 2014	General Physics (LN) [2]	4
Social & Behavioral Sciences (S)		
SPCH 2713	Introduction to Speech Communication (S)	3
Select 3 hours of any course designated (S)		3
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Basic Science		
PHYS 2114	General Physics (LN) [2]	4
Engineering		
ENGR 1111	Introduction to Engineering [2]	1
ENGR 1322	Engineering Design with CAD [2]	2
or ENGR 1332	Engineering Design with CAD for MAE	
ENGR 1412	Introductory Engineering Computer Programming [2]	2
Engineering Science		
ENSC 2113	Statics [2]	3
Select two of the following:		6
ENSC 2123	Elementary Dynamics	
ENSC 2143	Strength of Materials	
ENSC 2213	Thermodynamics	
ENSC 2613	Introduction to Electrical Science	
ENSC 3213	Computer Based Systems in Engineering	
ENSC 3233	Fluid Mechanics	
Industrial Engineering & Management		
IEM 2903	Manufacturing and Service Systems and Tools I [2]	3
IEM 3103	Introduction to Probabilistic Modeling [2]	3
IEM 3703	Manufacturing and Service Systems and Tools II [2]	3
Hours Subtotal		27
Major Requirements		
Mathematics		
MATH 3263	Linear Algebra and Differential Equations	3
Engineering Science		
ENSC 3313	Materials Science	3
Select 3 hours of the following:		3
ENSC 2123	Elementary Dynamics	
ENSC 2143	Strength of Materials	
ENSC 2213	Thermodynamics	
ENSC 2613	Introduction to Electrical Science	
ENSC 3213	Computer Based Systems in Engineering	
ENSC 3233	Fluid Mechanics	
Industrial Engineering & Management		
IEM 3303	Manufacturing Processes	3
IEM 3403	Collaborative Engineering Project Management	3
IEM 3503	Engineering Economic Analysis	3
IEM 3523	Engineering Cost Information and Control Systems	3
IEM 3813	Work Design, Ergonomics, and Human Performance	3
IEM 4013	Introduction to Operations Research	3
IEM 4103	Introduction to Quality Control	3
IEM 4113	Industrial Experimentation	3
IEM 4203	Facilities and Material Handling System Design	3
IEM 4413	Industrial Organization Management	3
IEM 4613	Production Planning and Control Systems	3
IEM 4713	Introduction to Systems Simulation Modeling	3
IEM 4723	Information Systems Design and Development	3
IEM 4913	Senior Design Projects	3
Select 3 hours of the following:		3
IEM 4163	Service Systems and Processes	
IEM 4623	Introduction to Supply Chain Management	
IEM 4953	Industrial Assessment and Improvement	
IEM 4990	Selected Topics in Industrial Engineering and Management (3)	
Hours Subtotal		54
Electives		

Select 3 hours of a 3000 or 4000 level ACCT, BADM, CS, ECON, EEE, Engineering, FIN, LSB, MATH, MGMT, MKTG, MSIS, or STAT selected in consultation with an advisor. Required courses in IEM curriculum are excluded.	3
Hours Subtotal	3
Total Hours	126

[1] If a "B" or higher is not earned in ENGL 1113 Composition I, ENGL 1213 Composition II or ENGL 1413 Critical Analysis and Writing II is also required (per Academic Regulation 3.5 (p. 781)).

[2] Courses that must be completed prior to admission to professional school.

Other Requirements

Admission to Professional School (required)

Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.00 is required in all courses applied to Professional School coursework.
2. A 'C' or better is required in each course that is a prerequisite for an IEM course and in technical courses listed, whether taken prior to admission to Professional School or not.
3. The major engineering design experience is satisfied by IEM 4913 Senior Design Projects.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Materials Science and Engineering

The field of materials science and engineering is expanding into a period of unprecedented intellectual challenges, opportunities and growth. Products created using materials science and engineering research contribute to the economic strength and security of not only the state, but also the country.

The School of Materials Science and Engineering is located at OSU-Tulsa's Helmerich Research Center, a premier facility which places the College of Engineering, Architecture and Technology in a unique position to conduct world-class education, research and technology development and transfer in advanced materials of strategic importance to our nation. Current research programs focus on materials for energy technologies, bio-materials for medical technologies, advanced materials for aerospace and defense, and materials for electronics and control technologies.

Program Educational Objectives

OSU is currently offering only a graduate program in Materials Science and Engineering.

Graduate Programs

The School of Materials Science and Engineering offers programs leading to the Master of Science and Doctor of Philosophy. A program of independent study and research on a project under the direction of a member of the Graduate Faculty will be satisfactorily completed by all graduate students. For the Master of Science candidate, the project may result in a thesis. For the Doctor of Philosophy candidate, the project results in a dissertation.
Four research areas of strategic importance have been identified at the Helmerich Advanced Technology Research Center (HRC) at OSU by industry leaders in and around Tulsa. These include: Materials for Energy Technologies, Bio-Materials for Medical Technologies, Advanced Materials for Aerospace, and Materials for Electronics and Control Technologies. All areas fall under the broad umbrella of the School of Materials Science and Engineering.

Admission Requirements

Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from a materials science and engineering or related curriculum approved by the ABET or a recognized equivalent from any international program.

Students with related undergraduate degrees, such as chemistry, physics, engineering physics, applied physics, etc. can be admitted conditionally, subject to completing prescribed Materials Science and Engineering program core courses. Admission is competitive based on undergraduate GPA, GRE and TOEFL (for international students), statement of interests, experience and recommendations.

The Master of Science Degree

The M.S. degree in MSE has both thesis and creative component (non-thesis) options. The thesis option requires a total of 30 credit hours, which includes 24 hours of formal coursework (regularly scheduled classes, not independent study) and 6 hours of a thesis. The non-thesis option or creative component requires a total of 35 credit hours, which includes 33 hours of formal coursework (regularly scheduled classes, not independent study) and 2 hours of a creative component or project. The main difference between the two options is that in the thesis option, students conduct independent research while in the creative component option, students conduct critical review of the literature on an advanced topic of interest to the MSE program. Both options require a professional report or thesis and an oral presentation. Student take 15 hours of core courses (required) with the remainder of the hours being MSE elective courses or their equivalent (to be approved by MSE graduate coordinator and the thesis advisor or has been considered as an equivalent MSE course). Students must complete no less than 21 hours of MSE 5000- and 6000-level courses through Oklahoma State University. For both options the courses taken must include:

Code	Title	Hours
MSE 5013	Advanced Thermodynamics of Materials	3
MSE 5023	Diffusion and Kinetics	3
MSE 5033	Composite Materials	3
MSE 5043	Advanced Materials Characterization	3
MSE 5083	Advanced Ceramics Processing	3

The Doctor of Philosophy Degree

The general credit requirement is a minimum of 90 credit hours beyond the BS degree, including at least 36 hours of credit for research and at least 30 hours of class work. It is expected that the courses must include:

Code	Title	Hours
MSE 5013	Advanced Thermodynamics of Materials	3
MSE 5023	Diffusion and Kinetics	3
MSE 5033	Composite Materials	3
MSE 5043	Advanced Materials Characterization	3
MSE 5083	Advanced Ceramics Processing	3
MSE 5693	Phase Transformations in Materials	3
MSE 5113	Diffraction in Materials	3

Students are responsible for consultation with their doctoral advisory committee in preparing the plan of study. Furthermore, students have to pass the PhD qualifying exam and the dissertation proposal defense to become eligible for candidacy for the PhD Degree, successfully conduct independent research for the dissertation, and pass the final dissertation defense in order to qualify for the PhD degree. More details can be found in the MSE Graduate Student Handbook.

Faculty

Raman P. Singh, PhD—Associate Dean and Head
Helmerich Family Endowed Chair and Director, Helmerich Research Center and Professor:
Raman P. Singh, PhD
Williams Companies Distinguished Chair and Regents Professor: Raj N. Singh, ScD
Professor and Varnadow Endowed Professor: Ranji Vaidyanathan, PhD, PE
Associate Professor: James Smay, PhD
Assistant Professors: Pankaj Sarin, PhD; Do Young Kim, PhD
Assistant Research Professor: Nirmal Govindaraju, PhD

Mechanical and Aerospace Engineering

No other profession unleashes the spirit of innovation like Mechanical Engineering and Aerospace Engineering. From research to real-world applications, mechanical and aerospace engineers discover how to improve lives by creating bold new solutions that connect science to life in unexpected, forward thinking ways. Few have such a direct and positive effect on everyday lives and we count on mechanical and aerospace engineers, and their imaginations, to help us meet the needs of the 21st century.

Mechanical and aerospace engineers know that life takes engineering, and that their disciplines provide freedom to explore, shape the future, encompass an enterprising spirit, and call for limitless imagination.

Engineering makes a world of difference and is essential to our health, happiness, and safety. Creative problem solving, while turning dreams into reality, is the core of Mechanical and Aerospace Engineering. These professional disciplines involve the invention, design, and manufacture of devices, machines and systems that serve the ever-changing needs of modern society.

Mechanical engineering is an exceedingly diverse field that spans an exceptionally wide range of systems, devices and vehicles. Mechanical engineers are vitally concerned with all forms of energy production, utilization and conservation. They are the key professionals in bringing about the green revolution, finding ways to reduce or eliminate pollution, minimize waste, reduce energy usage, and re-use waste, scrap, and recycled goods. They deal with everything mechanical and energy-consuming, whether small or large, simple or complex—from fuel cells to nuclear power plants, gas turbine engines to interplanetary space vehicles, artificial limbs to life support systems, robotic manipulators to complex automatic packaging machines, precision instruments to construction machinery, household appliances to mass transit systems, heating and air-conditioning systems to off-shore drilling platforms, and powered home and garden appliances to vehicles of all types. In virtually every organization where engineers are employed, mechanical engineers will be found.

The BS degree program in mechanical engineering, together with the premedical option in mechanical engineering, is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) under the criteria for mechanical and similarly named engineering programs.
Aerospace engineering is concerned with the science and technology of flight, and the design of air, land and sea vehicles for transportation and exploration. This exciting field has led people to the moon and continues to lead in the expansion of frontiers deeper into space and into the ocean's depths. Because of their unique backgrounds in aerodynamics and lightweight structures, aerospace engineers are becoming increasingly involved in solving some of society's most pressing and complex problems, such as high-speed ground transportation and pollution of the environment.
The BS degree program in aerospace engineering is accredited by the Engineering Accreditation Commission of the ABET under the criteria for aerospace and similarly named engineering programs.

MAE Mission

The mission of the School of Mechanical and Aerospace Engineering is to create a vibrant and stimulating learning and research environment and to instruct and encourage our students to reach their full potential in technical expertise, innovative expression, intellectual curiosity, and collaborative design.

MAE Mission for Undergraduate Instruction

The School of Mechanical and Aerospace Engineering will support the MAE and CEAT missions and the mission for instruction of Oklahoma State University by providing a first class education to students that is grounded in engineering fundamentals. The Faculty of MAE are committed to preparing engineers who are:

- Competitive nation-wide and internationally for employment opportunities and who will become respected achievers within their discipline.
- Well prepared for the pursuit of advanced studies at any university.
- Prepared for a lifetime of continuing development, which is demanded by disciplines involved with rapidly progressing technology.

Rigor

The GPA requirements for MAE professional school admission and the degree requirements for graduation are the highest in CEAT (see Departmental GPA Requirements, item f). This is essential to fulfill the MAE Mission for Undergraduate Instruction.

Program Educational Objectives

Program educational objectives are statements that describe the expected accomplishments and professional status of mechanical and aerospace engineering graduates three to five years beyond the baccalaureate degree. The School of Mechanical and Aerospace Engineering at Oklahoma State University is dedicated to graduating mechanical and aerospace engineers who:

1. Develop exemplary careers and become leaders to the greater benefit of society.
2. Earn a reputation as responsible and ethical professionals.
3. Develop innovative technologies and adapt to changing professional and societal norms with wisdom and integrity.

Student Outcomes and Specific Program Criteria

The student outcomes for students graduating from the mechanical and aerospace engineering BS programs are:

a. an ability to apply knowledge of mathematics, science, and engineering;
b. an ability to design and conduct experiments, as well as to analyze and interpret data;
c. an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
d. an ability to function on multidisciplinary teams;
e. an ability to identify, formulate and solve engineering problems;
f. an understanding of professional and ethical responsibility;
g. an ability to communicate effectively;

h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
i. a recognition of the need for, and an ability to engage in, life-long learning;
j. a knowledge of contemporary issues;
k. an ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

ABET requires specific program criteria which must be supported by the curricula and are unique to engineering disciplines. For the BSME Program, the specific ME program criteria are broken into three elements. The ME curriculum prepares graduates to:

1. ME1- demonstrate an ability to apply principles of engineering, basic science and mathematics (including multivariate calculus and differential equations);
2. ME2- demonstrate an ability to model, analyze, design, and realize physical systems, components or processes; and
3. ME3 – be prepared to work professionally in either thermal or mechanical systems areas while taking courses in each area.

For the BSAE Program, the specific AE program criteria are also broken into three elements. The AE curriculum prepares graduates with:

1. AE1 – knowledge of the following aeronautical topics: aerodynamics, aerospace materials, structures, propulsion, flight mechanics, and stability and control;
2. AE2 – knowledge of some of the following astronautical topics: orbital mechanics, space environment, attitude determination and control, telecommunications, space structures, and rocket propulsion; and
3. AE3 – graduates must have design competence which includes integration of aeronautical or astronautical topics.

Because mechanical engineering is perhaps the broadest of all engineering disciplines, the program provides not only excellent grounding in all engineering fundamentals, but also allows some flexibility in selecting controlled technical electives to suit the student's interests. In this selection, no one area may be unduly emphasized at the expense of another. For the aerospace engineering, biomedical engineering, and premedical programs, prescribed course work provides students with more focused development. Graduates are fully competent as mechanical or aerospace engineers, with abilities in design, and in-depth knowledge in their areas of concentration.

As a fundamental component of all BS programs, engineering design is strongly emphasized in the junior and senior years but is integrated throughout the curriculum. Most MAE courses at the 3000 and 4000 levels include some design content, ranging from a minimum of one-half to a maximum of four credit hours of design content. Each professional school course builds upon the preceding mechanical and aerospace engineering courses to develop in the student the ability to identify and solve meaningful engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The course work includes sensitizing students to socially-related technical problems and their responsibilities as engineering professionals to behave ethically and protect occupational and public safety. The program culminates in a senior-year design course in which students integrate analysis, synthesis, and other abilities they have developed throughout the earlier portions of their study into a capstone experience. The design experiences include the fundamental elements and features of design with realistic constraints such as economics, safety, reliability, social and environmental impact, and other factors. At this point, students are able to design components, systems and processes that meet specific requirements, including such pertinent societal considerations as ethics, safety, environmental impact and aesthetics. Students develop and display the ability to design and conduct experiments essential to specific studies and to analyze experimental results to draw meaningful conclusions.

An integral part of this educational continuum, from basic science through comprehensive engineering design, are learning experiences that facilitate the students' abilities to function effectively in both individual and team environments. The program also provides every graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and used as a part of their problem-solving experiences. Finally, the students' experience in solving ever-more-challenging problems gives them the ability to continue to learn independently throughout their professional careers.

The broad background and problem-solving ability of mechanical and aerospace engineers make them suited to engage in one or more of the following activities: research, development, design, production, operation, management, technical sales and private consulting. Versatility is their trademark. A bachelor's degree in mechanical or aerospace engineering is also an excellent background for entering other professional schools such as medicine, dentistry, law or business (MBA). The premedical option in mechanical engineering is available for students wishing to enroll in medical school.

In the professional school, (essentially the junior and senior years of the program) mechanical and aerospace engineering students extend their study of the engineering sciences and consider applications of fundamental principles and analysis tools to the solution of real technological problems of society. Some design courses involve students in the solution of authentic, current and significant engineering problems provided by industrial firms. Students may also help smaller firms that need assistance with the development of new products.

The student designs, with the guidance of an adviser, an individualized program of study consistent with his or her interests and career plans. Some students terminate their studies with a bachelor's degree, while others receive one of several graduate degrees.

Undergraduate Programs

- Aerospace Engineering, BSAE (p. 1500)
- Mechanical Engineering, BSME (p. 1502)
- Mechanical Engineering: Pre-Medical, BSME (p. 1504)

Graduate Programs

The School of Mechanical and Aerospace Engineering offers programs leading to the degree of Master of Science in Mechanical and Aerospace Engineering, and the degree of Doctor of Philosophy in Mechanical and Aerospace Engineering. Both of these degrees offer an option in Unmanned Aerial Systems and prepare the graduate for research and development positions in industry and government, or for the teaching profession in engineering. They are distinguished by the incorporation of a research component.

Students may select course work and participate in research or design projects in the following areas: aerodynamics, aeroelasticity, biomedical

engineering, design, computational mechanics, heat transfer dynamic systems and controls, fluid mechanics, materials, manufacturing processes, refrigeration, solid mechanics thermal and HVAC systems, unmanned aerial systems, and web handling systems. Students are encouraged to take courses in mathematics and science and in other fields of engineering which fit into their programs.

Admission Requirements

Admission to the Graduate College is required of all students pursuing the MS or PhD degree. Graduation from a mechanical or aerospace engineering curriculum accredited by the ABET, with scholastic performance distinctly above average, qualifies the student for admission to the School of Mechanical and Aerospace Engineering as a candidate for the MS and PhD degrees. Graduates from disciplines other than mechanical or aerospace engineering may be admitted if an evaluation of their transcripts by the School of Mechanical and Aerospace Engineering indicates they are prepared to take graduate-level course work in mechanical or aerospace engineering, or can be expected to do so after a reasonable amount of prerequisite work.

Degree Requirements

All degree programs follow an approved plan of study designed to satisfy the individual goals of the student, while conforming to the general requirements of the School of Mechanical and Aerospace Engineering and the Graduate College.

The Master of Science degree program with the thesis option requires 24 credit hours of approved graduate-level course work, and a suitable research thesis of six credit hours. The non-thesis option requires 35 credit hours of which two must be for an acceptable, directed research activity that results in a written and oral report to the faculty.

The Doctor of Philosophy degree requires a minimum of 60 credit hours beyond the master's degree, including a dissertation for which no more than 30 credit hours may be awarded.

Faculty

Daniel E. Fisher, PhD, PE – Professor and Head

Professor and Albert H. Nelson, Jr. Endowed Chair: Daniel E. Fisher, PhD, PE

Associate Head and Noble Foundation Chair in Web Handling and Director, Web Handling Research Center and Professor: James K. Good, PhD, PE

Regents Service Professor: Karl N. Reid, ScD

Regents Professor and Herrington Endowed Chair in Advanced Materials: Don A. Lucca, PhD, Drhc, CMfgE

Regents Professor, John Brammer Endowed Professorship: Afshin J. Ghajar, PhD, PE

Regents Professor and OG&E Energy Technology Chair: J.D. Spitler, PhD, PE

Professor and Tom J. Cunningham Endowed Chair: Andrew S. Arena, Jr., PhD

Professor and John Hendrix Chair, Ray & Linda Booker Endowed Professor and Director, Unmanned Systems Research Institute: Jamey D. Jacob, PhD

Associate Dean, OSU-Tulsa, Helmerich Family Endowed Chair and Director, Helmerich Research Center and Professor: Raman P. Singh, PhD

Professors: Geir Hareland, PhD, PE (adjunct); Lawrence L. Hoberock, PhD, PE (emeritus); David G. Lilley, PhD, DSc, PE (emeritus);Richard L. Lowery, PhD, PE (emeritus); Faye C. McQuiston, PhD, PE (emeritus); Peter M. Moretti, PhD, PE (emeritus); Prabhakar R. Pagilla, PhD (adjunct); Christopher E. Price, PhD, PE (emeritus); Robert L. Swaim, PhD, PE (emeritus); Gary E. Young, PhD, PE (emeritus); Larry D. Zirkle, PhD, PE (emeritus)

Associate Professors: Frank W. Chambers, PhD, PE (emeritus); Jay C. Hanan, PhD; Sandip Harimkar, PhD; James A. Kidd, PhD (clinical); Ali Kaan Kalkan, PhD; Khaled A. Sallam, PhD

Halliburton Professorship Fellow and Assistant Professor: Brian R. Elbing, PhD

Assistant Professors: Aurelie Azoug, PhD; Christian Bach, PhD; He Bai, PhD; Craig Bradshaw, PhD; Jerome Hausselle, PhD; Balaji Jayaraman, PhD; Xiaoliang Jin, PhD (emeritus); Rushikesh Kamalapurkar, PhD; Matthew J. Klopfstein, PhD (clinical); James M. Manimala, PhD; Kurt P. Rouser, PhD; Omer San, PhD; Arvind Santhanakrishnan, PhD; Shuodao Wang, PhD

Lecturers: Howard E. Conlon (emeritus); Joseph P. Connor, Jr. (adjunct assistant professor); Ronald D. Delahoussaye, PhD (adjunct professor); Richard J. Gaeta, PhD (adjunct associate professor); Ehsan Moallem, PhD (adjunct assistant professor); Jeremy A. Morton, PhD (adjunct associate professor)

Aerospace Engineering, BSAE

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.50
Total Hours: 124

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II [1]	
ENGL 1413	Critical Analysis and Writing II [1]	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1414	General Chemistry for Engineers (LN) [1]	4
or CHEM 1515	General Chemistry (LN)	
PHYS 2014	General Physics (LN) [1]	4
Social & Behavioral Sciences (S)		
Course designated (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Math and Basic Science		
MATH 2233	Differential Equations [1]	3
PHYS 2114	General Physics (LN) [1]	4
Select one of the following:		3
ASTR 1013	The Solar System (N)	
ASTR 1023	Stars, Galaxies, Universe (N)	
BIOL 1114	Introductory Biology (LN)	
CHEM 3053	Organic Chemistry	
GEOL 1114	Physical Geology (LN)	
GEOL 3413	Petroleum Geology for Engineers	
PHYS 3213	Optics	
PHYS 3313	Introduction to Semiconductor Device Physics	
PHYS 3713	Modern Physics I	
Engineering		
ENGR 1111	Introduction to Engineering [1]	1
ENGR 1332	Engineering Design with CAD for MAE [1]	2
ENGR 1412	Introductory Engineering Computer Programming [1]	2
Engineering Science		
ENSC 2113	Statics [1]	3
ENSC 2123	Elementary Dynamics [1]	3
ENSC 2143	Strength of Materials [1]	3
ENSC 2213	Thermodynamics [1]	3
ENSC 2613	Introduction to Electrical Science [1]	3
Hours Subtotal		30
Major Requirements		
Engineering Science		
ENSC 3233	Fluid Mechanics [1]	3
ENSC 3313	Materials Science	3
Specific Professional School		
MAE 3013	Engineering Analysis and Methods I	3
MAE 3113	Measurements and Instrumentation	3
MAE 3253	Applied Aerodynamics and Performance	3
MAE 3293	Compressible Fluid Flow	3
MAE 3323	Mechanical Design I	3
MAE 3403	Computer Methods in Analysis and Design	3
MAE 3723	Systems Analysis	3
MAE 4223	Aerospace Engineering Laboratory	3
MAE 4243	Aerospace Propulsion and Power	3
MAE 4283	Aerospace Vehicle Stability and Control	3
MAE 4374	Aerospace System Design	4
MAE 4513	Aerospace Structures I	3
IEM 3503	Engineering Economic Analysis	3
Select 6 hours of the following: [2]		6
MAE 3123	Manufacturing Processes	
MAE 3223	Thermodynamics II	
MAE 3233	Heat Transfer	
MAE 4053	Automatic Control Systems	
MAE 4063	Mechanical Vibrations	
MAE 4273	Experimental Fluid Dynamics	
MAE 4333	Mechanical Metallurgy	
MAE 4363	Advanced Methods in Design	
MAE 4733	Mechatronics Design	
MAE 4213	Spacecraft Design	
Hours Subtotal		52
Total Hours		124

[1] Courses that must be completed prior to admission to professional school.

[2] At least 3 hours selected from the 4000 level courses.

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.50 is required in all MAE prefix Courses.
2. A minimum overall GPA of 2.50 is required in 4000-level MAE prefix courses.
3. A 'C' or better is required in each course that is a prerequisite for a major course taken.
4. The major engineering design experience, capstone course, is satisfied by MAE 4374 Aerospace System Design

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Mechanical Engineering, BSME

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.50
Total Hours: 121

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II [1]	
ENGL 1413	Critical Analysis and Writing II [1]	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1414	General Chemistry for Engineers (LN) [1]	4
or CHEM 1515	General Chemistry (LN)	
PHYS 2014	General Physics (LN) [1]	4
Social & Behavioral Sciences (S)		
Course designated (S)		6
Hours Subtotal		42
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Math and Basic Science		
MATH 2233	Differential Equations [1]	3
PHYS 2114	General Physics (LN) [1]	4
Select one of the following:		3
ASTR 1013	The Solar System (N)	
ASTR 1023	Stars, Galaxies, Universe (N)	
BIOL 1114	Introductory Biology (LN)	
CHEM 3053	Organic Chemistry	
GEOL 1114	Physical Geology (LN)	
GEOL 3413	Petroleum Geology for Engineers	
PHYS 3213	Optics	
PHYS 3313	Introduction to Semiconductor Device Physics	
PHYS 3713	Modern Physics I	
Engineering		
ENGR 1111	Introduction to Engineering [1]	1
ENGR 1332	Engineering Design with CAD for MAE [1]	2
ENGR 1412	Introductory Engineering Computer Programming [1]	2
Engineering Science		
ENSC 2113	Statics [1]	3
ENSC 2123	Elementary Dynamics [1]	3
ENSC 2143	Strength of Materials [1]	3
ENSC 2213	Thermodynamics [1]	3
ENSC 2613	Introduction to Electrical Science [1]	3
Hours Subtotal		30
Major Requirements		
Engineering Science		
ENSC 3233	Fluid Mechanics [1]	3
ENSC 3313	Materials Science	3
Specific Professional School		
MAE 3013	Engineering Analysis and Methods I	3
MAE 3113	Measurements and Instrumentation	3
MAE 3223	Thermodynamics II	3
MAE 3233	Heat Transfer	3
MAE 3323	Mechanical Design I	3
MAE 3403	Computer Methods in Analysis and Design	3
MAE 3723	Systems Analysis	3
IEM 3503	Engineering Economic Analysis	3
Select 13 hours of the following 4 categories, selecting one course from each category so that all 4 categories are represented:		13
Category I (Thermal Systems Realization):		
MAE 4243	Aerospace Propulsion and Power	
MAE 4263	Energy Conversion Systems	
MAE 4703	Design of Indoor Environmental Systems	
MAE 4713	Thermal Systems Design, Simulation and Optimization	
Category II (Mechanical Systems Realization):		
MAE 4353	Mechanical Design II	
MAE 4363	Advanced Methods in Design	
MAE 4513	Aerospace Structures I	
MAE 4623	Biomechanics	
Category III (Laboratory):		
MAE 4273	Experimental Fluid Dynamics	
MAE 4333	Mechanical Metallurgy	
MAE 4733	Mechatronics Design	
Category IV (Capstone Design):		
MAE 4344	Design Projects	
MAE 4354	Aerospace Systems Design for Mechanical Engineers	

Select 6 hours to be selected from the following list, or from courses in the 4 categories listed above, but not used to satisfy the category requirement:		6
MAE 3033	Design of Machines and Mechanisms	
MAE 3123	Manufacturing Processes	
MAE 3253	Applied Aerodynamics and Performance	
MAE 3293	Compressible Fluid Flow	
MAE 4053	Automatic Control Systems	
MAE 4063	Mechanical Vibrations	
MAE 4313	Advanced Processing of Engineered Materials	
Hours Subtotal		49
Total Hours		121

[1] Courses that must be completed prior to admission to professional school.

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.50 is required in all MAE prefix Courses.
2. A minimum overall GPA of 2.50 is required in 4000-level MAE prefix courses.
3. A 'C' or better is required in each course that is a prerequisite for a major course taken.
4. The major engineering design experience, capstone course, is satisfied by MAE 4344 Design Projects or MAE 4354 Aerospace Systems Design for Mechanical Engineers.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Mechanical Engineering: Pre-Medical, BSME

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.50
Total Hours: 138

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II [1]	
ENGL 1413	Critical Analysis and Writing II [1]	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A) [1]	3
MATH 2163	Calculus III [1]	3
Humanities (H)		
Select 3 hours designated (H) from PHIL [2]		3
Select 3 hours designated (H) for ENGL		3
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1515	General Chemistry (LN) [1]	5
BIOL 1114	Introductory Biology (LN)	4
Social & Behavioral Sciences (S)		
Select 6 hours designated (S) from PSYC or SOC [2]		6
Hours Subtotal		43
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Math and Basic Science		
MATH 2233	Differential Equations [1]	3
PHYS 2014	General Physics (LN) [1]	4
PHYS 2114	General Physics (LN) [1]	4
CHEM 3053	Organic Chemistry	3
BIOL 1604	Animal Biology	4
Engineering		
ENGR 1111	Introduction to Engineering [1]	1
ENGR 1332	Engineering Design with CAD for MAE [1]	2
ENGR 1412	Introductory Engineering Computer Programming [1]	2
Engineering Science		
ENSC 2113	Statics [1]	3
ENSC 2123	Elementary Dynamics [1]	3
ENSC 2143	Strength of Materials [1]	3
ENSC 2213	Thermodynamics [1]	3
ENSC 2613	Introduction to Electrical Science [1]	3
Hours Subtotal		38
Major Requirements		
Engineering Science		
ENSC 3233	Fluid Mechanics [1]	3
ENSC 3313	Materials Science	3
Specific Professional School		
MAE 3013	Engineering Analysis and Methods I	3
MAE 3113	Measurements and Instrumentation	3
MAE 3223	Thermodynamics II	3
MAE 3233	Heat Transfer	3
MAE 3323	Mechanical Design I	3
MAE 3403	Computer Methods in Analysis and Design	3
MAE 3723	Systems Analysis	3
CHEM 3112	Organic Chemistry Lab	2
CHEM 3153	Organic Chemistry	3
IEM 3503	Engineering Economic Analysis	3
MICR 3033	Cell and Molecular Biology	3
Select 13 hours of the following 4 categories, selecting one course from each category so that all 4 categories are represented:		13
Category I (Thermal Systems Realization):		
MAE 4243	Aerospace Propulsion and Power	
MAE 4263	Energy Conversion Systems	
MAE 4703	Design of Indoor Environmental Systems	
MAE 4713	Thermal Systems Design, Simulation and Optimization	
Category II (Mechanical Systems Realization):		
MAE 4353	Mechanical Design II	
MAE 4363	Advanced Methods in Design	
MAE 4513	Aerospace Structures I	
MAE 4623	Biomechanics	
Category III (Laboratory):		
MAE 4273	Experimental Fluid Dynamics	
MAE 4333	Mechanical Metallurgy	
MAE 4733	Mechatronics Design	
Category IV (Capstone Design):		
MAE 4344	Design Projects	
MAE 4354	Aerospace Systems Design for Mechanical Engineers	
Select 6 hours to be selected from the following list, or from courses in the 4 categories listed above, but not used to satisfy the category requirement:		6

MAE 3033	Design of Machines and Mechanisms
MAE 3123	Manufacturing Processes
MAE 3253	Applied Aerodynamics and Performance
MAE 3293	Compressible Fluid Flow
MAE 4053	Automatic Control Systems
MAE 4063	Mechanical Vibrations
MAE 4313	Advanced Processing of Engineered Materials
The following are suggested, but not required:	
BIOC 3653	Survey of Biochemistry
BIOL 3023	General Genetics
BIOL 3204	Physiology
BIOL 4134	Embryology
CHEM 1314 is recommended with CHEM 1515 to meet the Oklahoma medical schools' requirement for 9 hours of inorganic chemistry	
Hours Subtotal	57
Total Hours	138

[1] Courses that must be completed prior to admission to professional school.

[2] Denotes medical school requirements. PSYC 1113 Introductory Psychology (S) is recommended to satisfy (3) hours of (S) requirement. PHIL 3833 Biomedical Ethics (H) is recommended to satisfy (3) hours of (H) requirement.

Note: The entrance requirements of medical schools of choice should be reviewed to ensure an application is competitive.

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A minimum GPA of 2.50 is required in all MAE prefix Courses.
2. A minimum overall GPA of 2.50 is required in 4000-level MAE prefix courses.
3. A 'C' or better is required in each course that is a prerequisite for a major course taken.
4. The major engineering design experience, capstone course, is satisfied by MAE 4344 Design Projects or MAE 4354 Aerospace Systems Design for Mechanical Engineers.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Mechanical Engineering Technology

Mechanical engineering technology (MET) is the component of engineering that specializes in design and application. MET includes the broad areas of mechanical design, mechanical power and manufacturing. Mechanical engineering technology is applied in mechatronics, robotics, automotive manufacturing, computer-aided drafting and design, computer-aided manufacturing, agricultural machinery and processing, mining, shipbuilding, spacecraft, electronics manufacturing, food processing, aircraft metals and plastics production—nearly the entire spectrum of the industry. In the power areas, MET graduates are involved in vapor power cycles, gas power cycles, air conditioning, fluid power and power transmission. Manufacturing areas involving MET graduates include tool design, cost evaluation and control, plant operations, production planning and manufacturing methods.

An important element in MET is the use of laboratory experience as a teaching tool. The MET program has laboratories in fluid power, materials, fluid mechanics and applied thermal sciences, basic instrumentation, computer-aided design (CAD), and manufacturing (CAM). A senior capstone design course, composed of student teams, integrates the knowledge and skills learned during their course of study. Laboratories are equipped with the latest computer software that supports the design function. Where appropriate, laboratories with modern computer data acquisition systems and on-screen displays are available.

In addition to the required mechanical engineering technology courses, students are provided a solid foundation in algebra, trigonometry and calculus, physics, chemistry, statics, dynamics, instrumentation, thermodynamics, computer science, and entrepreneurship (as a minor).

Program Educational Objectives

A few years after graduation, OSU Mechanical Engineering Technology graduates will:

1. Be employed in a technical or management position where the skills and knowledge of mechanical engineering technology are utilized.
2. Successfully apply mathematical, analytical, and technical skills to industrial problems, which may include the areas of design, manufacturing, graphical communications, and fluid power.
3. Within your employment environment, work proactively and productively as both members and leaders of teams.
4. Within your employment organization, communicate effectively in written, oral and graphical form.
5. Continue life-long learning by bringing new technology into their workplace, through participation and membership in professional organizations and/or through the continuation of professional studies.

Student Outcomes. Students graduating from the MET program are expected to achieve the following student outcomes (a-k):

a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;

b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;

e. an ability to function effectively as a member or leader on a technical team;

f. an ability to identify, analyze and solve broadly-defined engineering technology problems;

g. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

h. an understanding of the need for an ability to engage in self-directed continuing professional development;

i. an understanding of and a commitment to address professional and ethical responsibilities including respect for diversity;

j. a knowledge of the impact of engineering technology solutions in a societal and global context; and

k. a commitment to quality, timeliness, and continuous improvement.

Furthermore, the MET program has the following program specific outcomes (l to o):

Graduating MET students can proficiently apply

l. Computer aided drafting/design, manufacturing

m. Experimental techniques/procedure, analysis of engineering data

n. Machine/mechanical design/analysis

o. Fluid power, thermal/fluids system design

Preparation for a specific industrial function is accomplished by selecting courses that emphasize a given design area, such as fluid power, mechanical design, computer-aided design (CAD) power generation, and air conditioning and heating. Because the program focuses on the application of engineering principles to the pragmatic solution of problems, graduates are immediately productive with minimal on-the-job training, thus increasing their value to industry. Graduates of the MET program are prepared to function in the areas of product design, testing and evaluation; product application and maintenance field engineering; and technical sales and liaison. Industries employing MET graduates include manufacturing companies of all types (aircraft, automobile, compressor and turbine, fluid power manufacturers and others); energy companies (such as natural gas, electrical power generation, and the oil and gas industries); and service companies (transportation industry, architecture and professional engineering firms, and those supporting the oil and gas industry).

Companies utilizing the talents of MET graduates are diversified in their products, as well as geographical location, thus providing a variety of choices in respect to both type of work and place of residence and in diverse industrial, governmental and educational institutions.

The Mechanical Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org.

Undergraduate Programs

- Mechanical Engineering Technology, BSET (p. 1508)

Faculty

Chulho Yang, PhD, PE—Associate Professor and Program Coordinator
Professors: Richard A. Beier, PhD, PE; Young Chang, PhD, PE, CFPS
Associate Professor: Warren L. Lewis, MS
Assistant Professors: Aaron Alexander, MS; Hitesh Vora, PhD

Mechanical Engineering Technology, BSET

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 121

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
ENGL 3323	Technical Writing [1]	3
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one of the following:		5
MATH 1715	Precalculus (A)	
MATH 1513 & MATH 1613	College Algebra (A) and Trigonometry (A)	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
Select one of the following:		4
CHEM 1215	General Chemistry (LN)	
CHEM 1314	General Chemistry (LN)	
CHEM 1414	General Chemistry for Engineers (LN)	
PHYS 1114	General Physics (LN)	4
or PHYS 2014	General Physics (LN)	
PHYS 1214	General Physics (LN)	4
or PHYS 2114	General Physics (LN)	
Social & Behavioral Sciences (S)		
Select one of the following:		3
SPCH 2713	Introduction to Speech Communication (S)	
SPCH 3703	Small Group Communication	
SPCH 3723	Business and Professional Communication	
Course designated (S)		3
Additional General Education		
Courses designated (A) or (N)		3
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
Hours Subtotal		44
College/Departmental Requirements		
Mathematics		
MATH 2123	Calculus for Technology Programs I (A)	3
MATH 2133	Calculus for Technology Programs II (A)	3
Specialty		
MET 1213	Manufacturing Processes	3
MET 1223	Industrial Computer-Aided Design	3
MET 2103	Industrial Materials	3
MET 2313	Fundamentals of Hydraulic Fluid Power	3
Related Specialty		
ENGR 1412	Introductory Engineering Computer Programming	2
or EET 1003	Introduction to Microcomputer Programming	
GENT 1153	Engineering Graphics	3
GENT 2323	Statics	3
Hours Subtotal		26
Major Requirements		
GENT 3323	Strength of Materials	3
GENT 3433	Basic Thermodynamics	3
GENT 4433	Heat Transfer	3
MET 3003	Dynamics	3
MET 3113	Basic Instrumentation	3
MET 3313	Applied Fluid Mechanics	3
MET 3343	Physical Metallurgy	3
MET 4003	Machine Design I	3
MET 4103	Senior Design I	3
MET 4123	Senior Design II	3
MET 4463	Thermal Fluids Laboratory	3
EET 3104	Elements of Electricity and Electronics	3
or ENSC 2613	Introduction to Electrical Science	
IEM 3503	Engineering Economic Analysis	3
or IEM 3513	Economic Decision Analysis	
Select 9 hours of the following:		9
MET 3413	Fundamentals of Pneumatic Fluid Power	
MET 3423	Intermediate Hydraulic Fluid Power	
MET 3573	Advanced Production Processes	
MET 4013	Parametric Computer-Aided Modeling	
MET 4023	Advanced Mechanical Computer-Aided Design	
MET 4033	Applied Vibration and Acoustics	
MET 4050	Advanced Mechanical Design	
MET 4113	Practical Computational Fluid Dynamics	
MET 4203	Finite Element Methods	
MET 4303	Computer Integrated Manufacturing	
MET 4313	Electrohydraulics and Motion Control	
MET 4413	Ground Source Heat Pump Systems	
MET 4453	Applied Thermodynamics	
MET 4503	Petroleum Operations	
MET 4883	Tool Design	
MET 4993	Mechanical Engineering Technology Practice	
Hours Subtotal		48

Electives	
At least 3 upper-division hours from: Accounting, Astronomy, Biology, Chemistry, Computer Science, Engineering, Engineering Technology, Entrepreneurship and Emerging Enterprise, Finance, Geology, Legal Studies in Business, Management, Marketing, Mathematics, Physics and Statistics	3
Hours Subtotal	3
Total Hours	121

[1] If B or higher is not earned in ENGL 1113 Composition I or ENGL 1313 Critical Analysis and Writing I, ENGL 1213 Composition II or ENGL 1413 Critical Analysis and Writing II is also required (per Academic Regulation 3.5 (p. 781)).

Graduation Requirements

1. A minimum average GPA of 2.00 is required in all courses with an engineering or engineering technology prefix.
2. A grade of C or better is required in a 1000-3000-level GENT or MET course in order to advance to a course for which the GENT or MET course is prerequisite.
3. Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made so long as the changes do not delay graduation or result in semester hours being added.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

School of Architecture

The School of Architecture, founded in 1909, offers professional degree programs in both architecture and architectural engineering. The integration of these programs through shared faculty, facilities and course work is a major strength of the School. It is one of the few such integrated programs in the United States, and as such produces graduates who are particularly prepared for the integrated team processes used in professional practice. The School of Architecture is a primary unit in the College of Engineering, Architecture and Technology, and therefore benefits from excellent state-of-the-art resources which significantly enhance the School's professional programs. The program moved into a brand new facility, the Donald W. Reynolds School of Architecture Building in 2009, and at the same time celebrated its centennial as a School of Architecture.

The School of Architecture is dedicated to providing a high quality and focused professional education to students whose career goals are to enter the practice of architecture or architectural engineering.

Professional and liberal study electives provide opportunities for educational breadth or depth and a possible double degree in both architecture and architectural engineering and a minor in Architectural History/Theory, Architecture and Entrepreneurship, or minors available across OSU.

Oklahoma State University graduates are recruited by the leading architectural and architectural engineering firms both in Oklahoma and nationally. The Oklahoma State University School of Architecture is particularly proud of having among its alumni many of the leaders of the best firms in the country, an AIA Gold Medalist (the highest award given to an architect), and presidents of the American Institute of Architects (AIA) and the National Architectural Accreditation Board (NAAB).

Mission and Goals

Architecture is the difficult and complex art and science of designing and building a setting for human life. It is unique among today's professions in that its successful practice requires a blend, in roughly equal shares, of traits normally considered less than compatible: human empathy, artistic creativity, technological competence, and organizational and economic acumen. In contrast to other fine arts, architecture is rarely self-generated; it is rather a creative response to a stated or perceived human need. It must, therefore, be more user-oriented than fine art alone and more humane than pure science. Its design solutions must avoid the total subjectivity and detachment of other arts while striving to be functionally, technically and economically objective and sound. Yet, in a seemingly insoluble contradiction, the keenest technological and economic functionality will fall far short of becoming architecture unless it also strongly appeals to human spiritual and emotional values. When one thinks of the environment, one cannot help but see or recall architectural images: pyramids in Egypt, Greek and Roman temples, gothic cathedrals, medieval castles, industrial cities, modern skyscrapers and dwellings or entire cities which significantly express the culture and values of the people who live or lived there.

The mission of the School of Architecture is to prepare future architects and architectural engineers to make vital contributions to humanity through the creation of architecture. The vision of the school is to be nationally recognized for outstanding professionally focused programs in architecture and architectural engineering with strengths in design and the collaboration between architecture and architectural engineering.

The School of Architecture endeavors to instill in each individual sensitivity to human needs, a genuine concern for quality, integrity and high ideals, a positive attitude for life-long learning, and an appreciation for one's own self-esteem.

The School's primary goal is to provide excellence in professional education for students preparing to enter the private practice of architecture or architectural engineering. This professional focus is to educate not only qualified candidates for the degree, but graduates who, during their careers, will be licensed professionals and will assume positions of leadership within the profession and society.

Accreditation

The School of Architecture offers two separately accredited professional degree programs. The Bachelor of Architecture degree, BArch, is accredited by the NAAB. The Bachelor of Architectural Engineering degree, BArchE, is accredited by the Accreditation Board for Engineering and Technology (ABET http://www.abet.org) as an engineering program. Both programs require a minimum of five years of study to complete. In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB) which is the sole agency authorized to accredit U.S. professional degree programs in architecture offered by institutions with U.S. regional accreditation, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture , and the Doctor of Architecture. A program may be granted an eight-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards. Doctor of Architecture and Master of Architecture degree programs may require a preprofessional undergraduate degree in architecture for admission. However, the preprofessional degree is not, by itself, recognized as an accredited degree. The Oklahoma State University School of Architecture offers the following NAAB-accredited degree programs; B.Arch. (154 undergraduate credits).

The next accreditation visit will occur in 2017.

Architecture

Architecture is the complex synthesis of creatively solving problems involving both art and science through the disciplined orchestration of image making, activity organization, technological applications, legal constraints, and budgetary parameters which together express culture, enhance quality of life and contribute to the environment.

Education in architecture consists of campus-oriented classroom and studio courses, as well as off-campus studies. It is conducted in an intellectual climate which stimulates inquiry, introduces principles and values, and teaches the disciplines necessary to work in collaboration with others. The goal of the program is the education of future leaders within the architecture profession.

In the pre-professional portion of the architectural program (approximately two years of study), the focus is on the fundamental principles of design and technology supplemented by appropriate general education courses in English, social sciences and humanities. These courses allow students to assimilate a beginning knowledge base in architecture along with a broader liberal based component to their education.

Students who demonstrate proficiency in this portion of the program by meeting a specific set of admission criteria are eligible for admission to the professional program in architecture.

The professional program in architecture (typically three years) builds systematically upon the knowledge acquired in the pre-professional curriculum. Students expand their design and problem-solving abilities through a sequential series of design studios informed by sequences of courses dealing with structure, systems and materials, building technology, the history and theory of architecture, and business and project management principles. In addition students fully utilize the computer as a design and communication tool in the problem-solving process.

The design studio is the center of the School's educational program. It is the setting where students and faculty work most closely together, and where all specialized study and knowledge comes together and is synthesized in design. The record of OSU students' achievements in the design studios is evidenced by the success in national and international architectural design competitions. In addition to a student's design studio education, he or she is required to complete sequential courses in structures, architectural history/theory, technology, and management that work in correlation with the design studio sequence.

The program has long been known as one of the strongest professional programs in the United States. OSU graduates are consistently offered employment opportunities in many of the best architectural offices in Oklahoma and throughout the United States. The program is fully accredited by the National Architectural Accreditation Board.

Architectural Engineering

Architectural engineering is a profession that combines the art and science known as architecture with a detailed background in fundamental and applied engineering principles. In its broadest sense, it involves the creative application of science and technology to the design of structures meant for human occupancy. Architectural engineering differs from architecture in its focus upon the design of elements, systems and procedures for buildings, rather than the design of buildings themselves. Architectural engineers practice in a wide variety of professional engineering settings such as consulting firms, architectural firms, industrial or commercial organizations and governmental agencies.

The objective of the Bachelor of Architectural Engineering program is to provide basic and professional education to engineering students in building-related structural engineering. OSU graduates possess broad-based knowledge, skills, and judgment that prepare them to succeed in the profession of architectural engineering or in further studies at the graduate level. The program is designed to prepare students to contribute to society as professional engineers dealing with analysis, design and related activities within the construction industry. The program utilizes the broad resources of the University to exploit a close relationship with the architectural program and to provide in-depth understanding of the professional field and sensitivity to other less technical concerns related to the building environment faced by architectural engineers.

The primary focus of the architectural engineering program at OSU is the safe and economical design of structural systems used in buildings. These structural systems must withstand the various forces of nature such as gravity, winds and earthquakes, as well as the forces of man. These systems require a working knowledge of the mechanics of those materials commonly used for building structures such as steel, timber and reinforced concrete. Two new options are available for consideration in the architectural engineering program: Mechanical Electrical and Plumbing, and Construction Project Management.

The study of architectural engineering is an integrated mix of liberal studies, design and technical education. Architectural engineers need to be able to conceptualize aesthetic issues and design complex technical systems.

In the pre-professional portion of the architectural engineering program (approximately two years of study), the focus is on the underlying scientific and mathematical principles of engineering and the basic design principles of architecture supplemented by appropriate general education courses in English, social sciences and humanities. These courses allow students to assimilate a beginning knowledge base in architecture and engineering along with a broader liberal based component to their education. Students who demonstrate proficiency in this portion of the program by meeting a specific set of admission criteria are eligible for admission to the professional program in architectural engineering.

The professional program in architectural engineering (typically three years) builds systematically upon the scientific and architectural knowledge acquired in the pre-professional curriculum. Students acquire detailed technical and architectural knowledge and problem-solving abilities through a series of progressively more detailed and comprehensive courses and studios.

Each architectural engineering course builds upon the preceding architectural engineering courses to develop in the student the ability to identify and solve meaningful architectural engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. This course work includes sensitizing students to socially-related technical problems and their responsibilities as engineering professionals to behave ethically and protect public safety. The program culminates in a fifth year course in which the students integrate analysis, synthesis and other abilities they have developed throughout the earlier portions of their study into a capstone experience.

An integral part of this educational continuum from basic knowledge through comprehensive architectural engineering design are learning experiences that facilitate the students' abilities to function effectively in both individual and team environments. Students are exposed to a wide variety of problems dealing with contemporary issues in an international context. Moreover, the program provides every graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational and CAD tools are introduced and used as a part of the students' problem-solving experiences. Finally, the students' experience in solving ever-more-challenging problems gives them the ability to continue to learn independently throughout their professional careers

Architectural Engineering Educational Objectives. The educational objectives expected of program graduates a few years after graduation are as follows. These graduates:

- Will utilize their education in architectural engineering to contribute to society as licensed professional engineers.
- Will excel in their careers, displaying leadership, initiative, and broad-based knowledge and skills.
- Will have displayed a sensitivity to human needs and other less technical concerns related to the building environment.

- Will have utilized the close relationship with the architecture program to develop a special ability to collaborate with and relate to architects.
- Will have a positive attitude for life-long learning.

The architectural engineering program has adopted the following program outcomes:

a. an ability to apply knowledge of mathematics, science, and engineering.
b. an ability to design and conduct experiments, as well as to analyze and interpret data.
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
d. an ability to function on multidisciplinary teams.
e. an ability to identify, formulate, and solve engineering problems.
f. an understanding of professional and ethical responsibility.
g. an ability to communicate effectively.
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
i. a recognition of the need for, and an ability to engage in life-long learning.
j. a knowledge of contemporary issues.
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The program outcomes were adopted with the concept that they would provide students with the educational experience necessary to successfully achieve the longer term program educational objectives.

Undergraduate Curriculum

The programs in architecture and architectural engineering are five years long and offer the professional degrees of Bachelor of Architecture and Bachelor of Architectural Engineering.

Undergraduate Admission

Students who satisfy the University admission requirements are eligible to enroll for the first two years of the program (pre-architecture). Upon completion of these two years, the best qualified students are selected, upon application, by the School for admission to the upper division (professional program). Admission is based upon academic achievement and professional potential. Admission criteria are subject to annual review by the School and may be obtained directly from the School.

Transfer students are required to furnish transcripts and course descriptions for previous classroom courses, as well as examples of previous studio work. Evaluation and enrollment by the School is on a course-by-course basis for all transfer students.

General Education

At least 12 semester hours of basic science and mathematics can be counted toward General Education requirements, and some required course work in History and Theory of Architecture can be used for General Education credit.

Electives

Electives should be selected to comply with the appropriate undergraduate degree requirements for the program. (See 3.2 “Changes in Degree Requirements” in the “University Academic Regulations (p. 781)” section of the Catalog.) These requirements assure compliance with institutional and accreditation criteria.

Study Abroad

The School of Architecture is committed to preparing its graduates for the professional opportunities presented by the expanding global economy. As part of this preparation, the School offers a nine-week Summer European Study Program based in Rome, Italy. This program has been designed to supplement the required curriculum. Students study, in an organized and disciplined fashion, major examples of modern and historic European architecture, including urban issues. Both analytic and artistic sketching skills are the main tools developed in this course of study.

Experience has shown that the Summer European Study Program significantly increases a student’s level of maturity, independent thinking, and cultural and social awareness of others. Knowing the values and accomplishments of other cultures not only deepens and broadens knowledge and abilities; it also makes a student a better and more responsible citizen of his or her own country. Starting for freshman matriculating in the fall of 2016, the BArch curriculum will require a longer-term study abroad experience as a condition for graduation..

Faculty and Facilities

In keeping with the professional orientation of the School, the faculty have extensive experience as successful practicing architects and architectural engineers, as well as outstanding scholastic records. The diversity of the faculty is a strength.

The school moved into a new facility in 2009, the Donald W. Reynolds School of Architecture Building, which includes spacious design studios, a greatly expanded architectural library, day lighting lab, computer lab, classroom facilities and many other amenities. The Donald W. Reynolds School of Architecture received an AIA Oklahoma Honor Award recognizing its outstanding design in 2011.

Computers

All School of Architecture students enrolled in either the architecture or architectural engineering programs will be required to purchase a laptop computer as they enter the Professional Program (third year of the curriculum). Updated specifications for the computer and software will be provided each year.

Student Work

Projects submitted for regular class assignments may be retained by the School. All projects not retained will be available to the student.

Student Body

With the curriculum based upon extensive and personalized student-faculty interaction, the student-faculty ratio in studio courses is set at approximately 15 to one. Annual student enrollment is approximately 300 students.

Academic Advising

The College's Office of Student Academic Services provides initial advisement for all pre-professional architecture students. Prior to application to the Professional School, advisement is provided by the School of Architecture.

Each student is personally advised in the planning and scheduling of his or her course work and is counseled and advised individually on matters of career choice, his or her activities at OSU, and on other academic matters. An academic file is created for each student at the time of initial enrollment.

Admission to Professional School

Students applying for admission to the Professional School must first meet the required criteria established for each program. Applicants will be selected based upon their performance in the First and Second Year Architecture and Architectural Engineering curricula. Particular courses in the curricula, which have proven to be good indicators of success in the two programs, will be factored with a multiplier to increase their influence in the selection procedure. To be considered for either program, applicants must:

1. Complete a minimum of 55 credit hours of coursework (applicable to the degree plan) prior to admission to professional school.
2. Complete the following required first and second year courses with a grade of 'C' or better:
   For the Architecture program:

Code	Title	Hours
ARCH 1112	Introduction to Architecture	2
ARCH 2003	Architecture and Society (HI)	3
ARCH 1216	Architectural Design Studio I	6
ARCH 2116	Architectural Design Studio II	6
ARCH 2216	Architectural Design Studio III	6
ARCH 2263	Building Systems	3
MATH 2144	Calculus I (A)	4
PHYS 2014	General Physics (LN)	4
ENSC 2113	Statics	3
ENGL 1113	Composition I	3

   For the Architectural Engineering program:

Code	Title	Hours
ARCH 1112	Introduction to Architecture	2
ARCH 1216	Architectural Design Studio I	6
ARCH 2116	Architectural Design Studio II	6
ARCH 2216	Architectural Design Studio III	6
ARCH 2263	Building Systems	3
MATH 2144	Calculus I (A)	4
PHYS 2014	General Physics (LN)	4
ENSC 2113	Statics	3
ENSC 2143	Strength of Materials	3
ENGL 1113	Composition I	3

3. Achieve a grade of "C" or better in all required ARCH prefix courses, substitutes for ARCH prefix courses, and prerequisites for ARCH prefix courses.
4. Achieve a minimum Selection Grade Point Average (SGPA) of 2.80.

The Selection Grade Point Average (SGPA) will be calculated for each applicant by multiplying course credit hours by the multiplier, multiplying by the numerical course grade and dividing by the total factored hours.

For consideration of admission to the Architecture program, the following courses and multipliers will be used in calculating SGPAs: ARCH 1112 Introduction to Architecture (x1 multiplier), ARCH 2003 Architecture and Society (HI) (x1 multiplier), ARCH 1216 Architectural Design Studio I (x2 multiplier), ARCH 2116 Architectural Design Studio II (x2 multiplier), ARCH 2216 Architectural Design Studio III (x3 multiplier) ARCH 2263 Building Systems (x1 multiplier), MATH 2144 Calculus I (A) (x1 multiplier), PHYS 2014 General Physics (LN) (x1 multiplier), ENSC 2113 Statics (x1 multiplier), ENGL 1113 Composition I (x1 multiplier).

For the Architectural Engineering program the following courses are used in the SGPA calculation: ARCH 1112 Introduction to Architecture (x1 multiplier), ARCH 1216 Architectural Design Studio I (x1 multiplier), ARCH 2216 Architectural Design Studio III (x2 multiplier), ARCH 2263 Building Systems (x1 multiplier), MATH 2144 Calculus I (A) (x2 multiplier), PHYS 2014 General Physics (LN) (x2 multiplier), ENSC 2113 Statics (x3 multiplier), ENSC 2143 Strength of Materials (x2 multiplier), ENGL 1113 Composition I (x1 multiplier).

Double Degree

Applicants wishing to enter into the Professional School in both the B.ARCH and B.ARCH ENG. degree programs must apply for both programs and be accepted to each, independent of the other.

Change of Program

Changing programs, Architecture to Architectural Engineering or vice versa, typically occurs via formal application and admission to the other program through the Professional School application and admission process.

Taking ARCH Prefix Courses When Not Admitted to Professional School

Students not admitted to the Professional Schools may not enroll in any 3000 level or higher ARCH prefix course or ARCH 2203 History and Theory of Architecture Since 1900 without prior permission of the instructor and Academic Advisor.

Transfer Students

Students wishing to transfer into the Professional School of the OSU School of Architecture must apply for admission to the Professional School in the same manner as OSU students.

Completion of Required Pre-Professional School Courses

All students applying for admission to Professional School must satisfactorily complete all required courses for consideration by the end of the spring semester of the year of application.

Application and Notification Dates

Application for admission, readmission or transfer to the Professional School of Architecture and Architectural Engineering must be made by the last working day of April of the year of intended admission.

Notification of selection decisions will normally be made soon after June 1st but not before a two week period after Grade Reports have been received by the School – if there should be ANY problem with a grade that may impact acceptance to the Professional Schools the student should contact the School immediately. Selected applicants must confirm acceptance of the offer of a position in the Professional School by the date indicated in the letter of offer.

Reapplication

Applicants not admitted may reapply for admission to the Professional School the following year; such applicants do not carry any priority or disadvantage but are included in the full application pool.

Undergraduate Programs

- Architectural Engineering: Construction Project Management, BEN (p. 1515)
- Architectural Engineering: Mechanical, Electrical and Plumbing, BEN (p. 1517)
- Architectural Studies: Architecture and Entrepreneurship (ASAE), Minor (p. 1519)
- Architectural Studies: History and Theory (ASHT), Minor (p. 1520)
- Architecture Engineering: Structures, BEN (p. 1521)
- Architecture, BAR (p. 1523)

Faculty

Suzanne D. Bilbeisi, MArch, AIA – Professor and Head
Professor and Centennial Professor: Suzanne D. Bilbeisi, MArch, AIA
AT&T Professor and Associate Dean, CEAT Academic Affairs: Randy Seitsinger, MArch, FAIA
Professors: Mohammed Bilbeisi, MArch, RA;, Nigel R. Jones, MArch, RIBA, RA; Steve E. O'Hara, MArchEngr, PE; Khaled Mansy, PhD; Tom Spector, PhD, AIA
Associate Professors: Jeanne Homer, MArch, AIA; John Phillips, MArchEngr, PE; Seung Ra, MArch, AIA; Michael Rabens, PhD; Carisa Ramming, MArchEngr, PE; Nathan Richardson, MArch, AIA; Awilda C. Rodriquez, MArch, RA; Paulo Sanza, MArch, RA;
Jerry L. Stivers, MArch, AIA
Assistant Professors: Stan Carroll, MArch, AIA

Architectural Engineering: Construction Project Management, BEN

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 157

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
HIST 1103	Survey of American History	3
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A)	3
Humanities (H)		
ARCH 2003	Architecture and Society (HI)	3
Natural Sciences (N)		
CHEM 1414	General Chemistry for Engineers (LN)	4
PHYS 2014	General Physics (LN) [1]	4
Social & Behavioral Sciences (S)		
Consult the college & departmental requirements		
Any lower division course designated (S)		3
Diversity (D)		
Any course designated (D)		
Students are encouraged to meet the requirement in their selection of (H) or (S) course work		
International Dimension (I)		
ARCH 2003 meets the (I) requirement.		
Scientific Investigation (L)		
Any course designated (L). Normally met by Natural Sciences and/or Basic Science requirements.		
Hours Subtotal		33
College/Departmental Requirements		
Engineering Science		
ENSC 2113	Statics [1]	3
ENSC 2143	Strength of Materials [1]	3
Architecture		
ARCH 1112	Introduction to Architecture [1]	2
ARCH 1216	Architectural Design Studio I [1]	6
ARCH 2116	Architectural Design Studio II [1]	6
ARCH 2216	Architectural Design Studio III [1]	6
ARCH 2263	Building Systems [1]	3
Hours Subtotal		29
Major Requirements/Professional School		
Admitted to Professional School of Architecture (see requirements for admission to the upper-division)		
Architecture		
ARCH 3223	Structures: Timbers	3
ARCH 3262	Computer Applications in Architecture II	2
ARCH 3263	Materials In Architecture	3
ARCH 3323	Structures: Steel I	3
ARCH 4093	Architectural Project Management	3
ARCH 4123	Structures: Concrete I	3
ARCH 4134	Architectural Science I: Thermal Systems and Life Safety for Architectural Engineers	4
ARCH 4143	Structures: Foundations for Buildings	3
ARCH 4263	Architecture Seminar	3
ARCH 4433	Architectural Science II: Acoustics and Lighting for Architectural Engineers	3
ARCH 5226	Architectural Engineering Comprehensive Design Studio	6
Civil Engineering		
CIVE 3623	Engineering Materials Laboratory	3
CIVE 3614	Engineering Surveying	4
CIVE 4273	Construction Engineering and Project Management	3
Industrial Engineering & Management		
IEM 3503	Engineering Economic Analysis	3
Engineering Science, Engineering		
ENSC 2123	Elementary Dynamics	3
ENSC 2213	Thermodynamics	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 3313	Materials Science	3
ENGR 1412	Introductory Engineering Computer Programming	2
Mathematics		
MATH 2163	Calculus III	3
MATH 2233	Differential Equations	3
Statistics		
STAT 4033	Engineering Statistics	3
Basic Science		
Select one of the following:		4
ASTR 1013	The Solar System (N)	
BIOL 1114	Introductory Biology (LN)	
CHEM 1314	General Chemistry (LN)	
CHEM 1515	General Chemistry (LN)	
GEOG 1114	Physical Geography (LN)	
GEOL 1014	Geology and Human Affairs (LN)	
GEOL 1114	Physical Geology (LN)	
Humanities (H)		
Select 3 hours ARCH H/T designated (H)		3

Natural Sciences (N)		
PHYS 2114	General Physics (LN)	4
Social & Behavioral Sciences (S)		
Consult the college & departmental requirements		
Any upper division course designated (S)		3
Controlled Electives		
Must be selected from the course list of restricted electives available in the School of Architecture		9
Hours Subtotal		95
Total Hours		157

[1] Courses that must be completed prior to admission to professional school.

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A final grade of 'C' or better in all ARCH prefix courses, substitutions for ARCH prefix courses, and all non-ARCH prefix courses that are a prerequisite to an ARCH prefix course.
2. The capstone course for Architectural Engineering majors is ARCH 5226 Architectural Engineering Comprehensive Design Studio.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Architectural Engineering: Mechanical, Electrical and Plumbing, BEN

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 157

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
HIST 1103	Survey of American History	3
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A)	3
Humanities (H)		
ARCH 2003	Architecture and Society (HI)	3
Natural Sciences (N)		
CHEM 1414	General Chemistry for Engineers (LN)	4
PHYS 2014	General Physics (LN) [1]	4
Social & Behavioral Sciences (S)		
Consult the college & departmental requirements		
Any lower division course designated (S)		3
Hours Subtotal		33
Diversity (D)		
Any course designated (D)		
Students are encouraged to meet the requirement in their selection of (H) or (S) course work		
International Dimension (I)		
ARCH 2003 meets the (I) requirement		
Scientific Investigation (L)		
Any course designated (L). Normally met by Natural Sciences and/or Basic Science requirements.		
College/Departmental Requirements		
Engineering Science		
ENSC 2113	Statics [1]	3
ENSC 2143	Strength of Materials [1]	3
Architecture		
ARCH 1112	Introduction to Architecture [1]	2
ARCH 1216	Architectural Design Studio I [1]	6
ARCH 2116	Architectural Design Studio II [1]	6
ARCH 2216	Architectural Design Studio III [1]	6
ARCH 2263	Building Systems [1]	3
Hours Subtotal		29
Major Requirements/Professional School		
Admitted to Professional School of Architecture (see requirements for admission to the upper-division)		
Architecture		
ARCH 3223	Structures: Timbers	3
ARCH 3262	Computer Applications in Architecture II	2
ARCH 3323	Structures: Steel I	3
ARCH 4093	Architectural Project Management	3
ARCH 4123	Structures: Concrete I	3
ARCH 4131	Architectural Science Lab	1
ARCH 4134	Architectural Science I: Thermal Systems and Life Safety for Architectural Engineers	4
ARCH 4233	Sustainable Design in Architecture	3
ARCH 4263	Architecture Seminar	3
ARCH 4433	Architectural Science II: Acoustics and Lighting for Architectural Engineers	3
ARCH 5226	Architectural Engineering Comprehensive Design Studio	6
Mechanical and Aerospace Engineering		
MAE 3223	Thermodynamics II	3
MAE 3233	Heat Transfer	3
Fire Protection and Safety Technology		
FPST 1373	Fire Suppression and Detection Systems	3
Industrial Engineering & Management		
IEM 3503	Engineering Economic Analysis	3
Engineering Science, Engineering		
ENSC 2123	Elementary Dynamics	3
ENSC 2213	Thermodynamics	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 3233	Fluid Mechanics	3
ENGR 1412	Introductory Engineering Computer Programming	2
Mathematics		
MATH 2163	Calculus III	3
MATH 2233	Differential Equations	3
Statistics		
STAT 4033	Engineering Statistics	3
Basic Science		
Select one of the following:		4
ASTR 1013	The Solar System (N)	
BIOL 1114	Introductory Biology (LN)	
CHEM 1314	General Chemistry (LN)	
CHEM 1515	General Chemistry (LN)	
GEOG 1114	Physical Geography (LN)	
GEOL 1014	Geology and Human Affairs (LN)	
GEOL 1114	Physical Geology (LN)	
Humanities (H)		
Select 3 hours ARCH H/T designated (H)		3

Natural Sciences (N)		
PHYS 2114	General Physics (LN)	4
Social & Behavioral Sciences (S)		
Consult the college & departmental requirements		
Any upper division course designated (S)		3
Controlled Electives		
Must be selected from the course list of restricted electives available in the School of Architecture		12
Hours Subtotal		95
Total Hours		157

[1] Courses that must be completed prior to admission to professional school.

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A final grade of 'C' or better in all ARCH prefix courses, substitutions for ARCH prefix courses, and all non-ARCH prefix courses that are a prerequisite to an ARCH prefix course.
2. The capstone course for Architectural Engineering majors is ARCH 5226 Architectural Engineering Comprehensive Design Studio.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Architectural Studies: Architecture and Entrepreneurship (ASAE), Minor

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Suzanne Bilbeisi, suzanne.bilbeisi@okstate.edu, 101 DWR Arch. Bldg, 405-744-6043

Minimum Overall Grade Point Average: 2.50 with no grade below "C"
Total Hours: 21 hours

Code	Title	Hours
Minor Requirements		
ARCH 5193	Management of Architectural Practice	3
ARCH 5093	Real Estate Development	3
ARCH 5493	Entrepreneurship and Architecture	3
Select six hours of the following:		6
MKTG 3213	Marketing (S)	
MGMT 3013	Fundamentals of Management (S)	
LSB 3213	Legal and Regulatory Environment of Business	
ECON 3033	Economics of Entrepreneurship and Innovation	
Select six hours of the following:		6
EEE 3023	Introduction to Entrepreneurial Thinking and Behavior	
EEE 3033	Women and Minority Entrepreneurship (D)	
EEE 4403	Social Entrepreneurship	
EEE 4483	Entrepreneurship and New Technologies	
EEE 4533	Growing Small and Family Ventures	
EEE 4663	Imagination in Entrepreneurship	

Additional OSU Requirements

Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf).

Architectural Studies: History and Theory (ASHT), Minor

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

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Minimum Overall Grade Point Average: 2.50 with no grade below "C"
Total Hours: 21 hours

Code	Title	Hours
Minor Requirements		
ARCH 2003	Architecture and Society (HI)	3
Select any six additional Architectural history/theory courses [1]		18

[1] May include ARCH 4373 Field Study in Europe I/ARCH 5373 Field Study in Europe II (European Program) and/or ARCH 3370 Urban USA Field Study (Urban USA Program).

Up to 6 hours of ART History and Theory coursework may be included, but must be approved by faculty.

Additional OSU Requirements

Undergraduate Minors

- An undergraduate minor must include between fifteen and thirty hours, inclusive, of undergraduate coursework.
- A minimum of six credit hours for the minor must be earned in residence at OSU.
- The courses required for a minor may be included in the course requirements for any undergraduate degree or they may be in addition to degree requirements, depending on the overlap between the minor and degree requirements. However, an undergraduate minor must be earned in an academic field other than the student's declared degree option. The minor may not duplicate the degree major or option (for example, a student who earns a BA in Art with an Art History option may earn a minor in Studio Art but not Art History).
- A student generally follows the minor requirements associated with his or her matriculation year or newer requirements that have been established since matriculation. The time limit for following minor requirements from a given academic year is six years.

For additional information on requirements on minors, click here (https://stw.sp.okstate.edu/policies/Shared%20Documents/Requirements%20for%20Undergraduate%20and%20Graduate%20Minors.pdf).

Architecture Engineering: Structures, BEN

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 157

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
MATH 2153	Calculus II (A)	3
Humanities (H)		
ARCH 2003	Architecture and Society (HI)	3
Select 3 hours ARCH history designated (H)		3
Natural Sciences (N)		
CHEM 1414	General Chemistry for Engineers (LN)	4
PHYS 2014	General Physics (LN) [1]	4
Selet any Natural Science with laboratory		4
Social & Behavioral Sciences (S)		
Courses designated (S)		
Select 3 hours lower division		3
Select 3 hours upper division		3
Hours Subtotal		43
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
At least one Diversity (D) course		
At least one International Dimension (I) course		
College/Departmental Requirements		
Engineering Science		
ENSC 2113	Statics [1]	3
ENSC 2143	Strength of Materials [1]	3
Architecture		
ARCH 1112	Introduction to Architecture [1]	2
ARCH 1216	Architectural Design Studio I [1]	6
ARCH 2116	Architectural Design Studio II [1]	6
ARCH 2216	Architectural Design Studio III [1]	6
ARCH 2263	Building Systems [1]	3
Hours Subtotal		29
Major Requirements		
Architecture		
ARCH 3143	Structures: Analysis I	3
ARCH 3223	Structures: Timbers	3
ARCH 3224	Structures: Steel II	4
ARCH 3262	Computer Applications in Architecture II	2
ARCH 3323	Structures: Steel I	3
ARCH 4093	Architectural Project Management	3
ARCH 4123	Structures: Concrete I	3
ARCH 4134	Architectural Science I: Thermal Systems and Life Safety for Architectural Engineers	4
ARCH 4143	Structures: Foundations for Buildings	3
ARCH 4224	Structures: Concrete II	4
ARCH 4263	Architecture Seminar	3
ARCH 4433	Architectural Science II: Acoustics and Lighting for Architectural Engineers	3
ARCH 4444	Structures: Analysis II	4
ARCH 5226	Architectural Engineering Comprehensive Design Studio	6
Civil Engineering		
CIVE 4711	Basic Soils Testing Laboratory	1
Industrial Engineering & Management		
IEM 3503	Engineering Economic Analysis	3
Engineering Science, Engineering		
ENSC 2123	Elementary Dynamics	3
ENSC 2213	Thermodynamics	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 3313	Materials Science	3
ENGR 1412	Introductory Engineering Computer Programming	2
Mathematics		
MATH 2163	Calculus III	3
MATH 2233	Differential Equations	3
Statistics		
STAT 4033	Engineering Statistics	3
Natural/Basic Science		
PHYS 2114	General Physics (LN)	4
Hours Subtotal		79
Electives		
Must be selected from the course list available in the School of Architecture		
Select 6 credit hours of restricted electives		6
Hours Subtotal		6
Total Hours		157

[1] Courses that must be completed prior to admission to professional school.

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

1. A final grade of 'C' or better in all ARCH prefix courses, substitutions for ARCH prefix courses, and all non-ARCH prefix courses that are a prerequisite to an ARCH prefix course.
2. The capstone course for Architectural Engineering majors is ARCH 5226 Architectural Engineering Comprehensive Design Studio.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.

Architecture, BAR

Requirements for Students Matriculating in or before Academic Year 2017-2018. Learn more about University Academic Regulation 3.1 (p. 783).

Minimum Overall Grade Point Average: 2.00
Total Hours: 154

Code	Title	Hours
General Education Requirements		
All General Education coursework requirements are satisfied upon completion of this degree plan		
English Composition		
See Academic Regulation 3.5 (p. 784)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II	
ENGL 1413	Critical Analysis and Writing II	
ENGL 3323	Technical Writing	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865	
HIST 1493	American History Since 1865	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
MATH 2144	Calculus I (A) [1]	4
ENSC 2113	Statics [1]	3
Humanities (H)		
ARCH 2003	Architecture and Society (HI)	3
Select 3 hours ARCH history designated (H)		3
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
PHYS 1114	General Physics (LN) [1]	4
or PHYS 2014	General Physics (LN)	
Select 3 hours designated (N)		3
Social & Behavioral Sciences (S)		
Courses designated (S)		
Select 3 hours lower division		3
Select 3 hours upper division		3
Additional General Education		
Courses Designated (A), (H), (N), or (S)		3
Hours Subtotal		41
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
At least one Diversity (D) course		
At least one International Dimension (I) course		
College/Departmental Requirements		
Architecture		
ARCH 1112	Introduction to Architecture [1]	2
ARCH 1216	Architectural Design Studio I [1]	6
ARCH 2116	Architectural Design Studio II [1]	6
ARCH 2216	Architectural Design Studio III [1]	6
ARCH 2263	Building Systems [1]	3
Hours Subtotal		23
Major Requirements		
Architecture		
ARCH 3116	Architectural Design Studio IV	6
ARCH 3134	Architectural Science I: Thermal Systems and Life Safety	4
ARCH 3216	Architectural Design Studio V	6
ARCH 3223	Structures: Timbers	3
ARCH 3252	Computer Applications in Architecture I	2
ARCH 3262	Computer Applications in Architecture II	2
ARCH 3263	Materials In Architecture	3
ARCH 3323	Structures: Steel I	3
ARCH 3433	Architectural Science II: Acoustics and Lighting	3
ARCH 4093	Architectural Project Management	3
ARCH 4116	Design Studio VI	6
ARCH 4123	Structures: Concrete I	3
ARCH 4216	Architectural Design Studio VII	6
ARCH 4263	Architecture Seminar	3
ARCH 4374	International Field Study	4
ARCH 5117	Architectural Design Studio VIII	7
ARCH 5193	Management of Architectural Practice	3
Architecture Electives		
Select ARCH Electives		6
ARCH History		
ARCH 2203	History and Theory of Architecture Since 1900	3
Select 3 hours ARCH History		3
Hours Subtotal		79
Electives		
Must be selected from the course list available in the School of Architecture		
Select 11 credit hours of restricted electives		11
Hours Subtotal		11
Total Hours		154

[1] Courses that must be completed prior to admission to professional school.

Admission to Professional School (required)

- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements

- A final grade of 'C' or better in all ARCH prefix courses, substitutions for ARCH prefix courses, and all non-ARCH prefix courses that are a prerequisite to an ARCH prefix course.
- The capstone course for Architecture majors is ARCH 5117 Architectural Design Studio VIII.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2023.