



# College of Engineering

## UNIVERSITY OF GEORGIA

### Eight Undergraduate Majors in the College of Engineering

#### **Bachelor of Science in Agricultural Engineering**

The overall goals of the Bachelor of Science in Agricultural Engineering program are to provide a fundamental understanding of the natural, mathematical, and engineering sciences. Graduates can apply this understanding to design devices and processes in a wide range of careers in civil, mechanical, electrical, agricultural, environmental, and process engineering.

#### **Bachelor of Science in Biochemical Engineering**

Biochemical Engineering utilizes the governing principles of living systems, properties of biological materials, and engineering methodology in the processing of biological materials and in processes using biological agents such as cells, enzymes, and antibodies.

#### **Bachelor of Science in Biological Engineering**

Biological Engineers use engineering methods and the principles of biology to solve some of the greatest challenges facing society today. The graduates of this program have a deep background in engineering, mathematical and biological sciences, and the ability to design systems that integrate the biology with technology.

#### **Bachelor of Science in Civil Engineering**

Civil Engineering is the oldest engineering discipline dealing with the planning, design, construction, and operation of facilities necessary to modern life such as homes, buildings, bridges, roads, ports and harbors, airports, dams, and water and wastewater treatment facilities. Graduates will be tasked with meeting the challenges of a growing world by solving problems related to traffic congestion, clean water supply, and urban infrastructure development.

#### **Bachelor of Science in Computer Systems Engineering**

The Computer Systems Engineering undergraduate program emphasizes the application of engineering concepts, techniques, and methods to development of systems founded in hardware-software integration. Unlike the traditional focus of computer engineering, computer system engineers will have a greater understanding of computer software development and how to use computers to automate, monitor, and control various systems.

#### **Bachelor of Science in Electrical and Electronics Engineering**

Electrical and Electronics Engineering involves the study and application of electricity, electronics and electromagnetism in highly relevant areas such as power and control systems, microelectronics, and telecommunications. In this degree program, students will learn about how electrical engineering integrates math, physics, science, and technology to enable them to design electronic devices from microchips to industrial controls.

### **Bachelor of Science in Environmental Engineering**

Environmental issues are paramount to our society. Challenges in energy, water resources, solid waste, air quality, globalization, climate change, urban sprawl, food production, and environmental degradation must be addressed in a comprehensive effort to promote a sustainable and resilient society. Graduates will be uniquely prepared for careers devoted to finding solutions to these and other problems.

### **Bachelor of Science in Mechanical Engineering**

Mechanical Engineering is a very broad discipline that has helped create the modern society that we enjoy. The goal of the mechanical engineering program is to prepare students to provide solutions to current and future pressing societal challenges, such as environmental problems, energy concerns and the build environment, and advances in medical and manufacturing technologies.

## **3 Schools in the College of Engineering**

The UGA College of Engineering is divided into three separate interdisciplinary schools.

### *School of Chemical, Materials, and Biomedical Engineering (CMB)*

- Bachelor of Science in Biological Engineering
- Bachelor of Science in Biochemical Engineering

### *School of Environmental, Civil, Agricultural, and Mechanical Engineering (ECAM)*

- Bachelor of Science in Environmental Engineering
- Bachelor of Science in Civil Engineering
- Bachelor of Science in Agricultural Engineering
- Bachelor of Science in Mechanical Engineering

### *School of Electrical and Computer Engineering (ECE)*

- Bachelor of Science in Electrical and Electronics Engineering
- Bachelor of Science in Computer Systems Engineering

## **High Demand Major Application Process**

All new students admitted to the UGA College of Engineering enter the College as an Intended Major. Applicants for full major status in the College will be selected based on their grades in general education and major specific courses along with information submitted in a personal statement of purpose (PSOP).

- General Education Coursework (30%)
- Major Specific Coursework (40%)
- Personal Statement of Purpose (30%)

### **General Education Coursework (30 %)**

General Education Coursework applies to all degree programs. Students must complete the following courses with a grade of "C" (2.0) or better:

- MATH 2250: Calculus I for Science and Engineering
- MATH 2260: Calculus II for Science and Engineering
- PHYS 1211: Principles of Physics for Scientists and Engineers - Mechanics, Waves, Thermodynamics - OR - PHYS 1251: Introductory Studio Physics for Engineers I
- ENGL 1101: English Composition I

### **Major Specific Coursework (40%)**

Major Specific Coursework requirements differ for students depending on their intended major. Students must complete the required Major Specific Courses with a grade of "C" (2.0 or better.)

To be considered as a candidate for Agricultural Engineering, Civil Engineering, Environmental Engineering, or Mechanical Engineering, students must complete the following courses:

- ENGR 1120: Engineering Graphics and Design or its equivalent
- ENGR 1140: Computational Engineering Methods or its equivalent
- ENGR 2120: Engineering Statics or its equivalent

To be considered as a candidate for Biological Engineering or Biochemical Engineering, students must complete the following courses:

- BIOL 1107 & BIOL 1107L: Principles of Biology I and Lab or equivalencies
- CHEM 1212 & CHEM 1212L: Freshman Chemistry II and Lab or equivalencies
- ENGR 2120: Engineering Statics or its equivalent

To be considered as a candidate for Computer Systems Engineering, students must complete the following courses:

- CSEE 2220: Fundamentals of Logic Design or its equivalent
- CSEE 2210: Introduction to Computer Systems Engineering II or its equivalent
- CSCI 1302: Software Development or its equivalent

To be considered as a candidate for Electrical & Electronics Engineering, students must complete the following courses:

- CSEE 2220: Fundamentals of Logic Design or its equivalent
- ELEE 1030: Intro to Electrical Engineering or its equivalent
- ENGR 2170: Circuits or its equivalent

### **Personal Statement of Purpose (30 %)**

Students must schedule an appointment to write their personal statement of purpose at the University Testing Center. There is a time period during each application cycle as identified on the College's website when students can schedule this appointment. In no more than two pages, students provide a personal statement of purpose by following the prompts below.

- Explain your interest in engineering and describe your experience with engineering.
- What is your ultimate career aspiration?
- How will your chosen College of Engineering majors enable you to reach your career goals?

*The above criteria are minimum application requirements and do not guarantee acceptance to any major in the College of Engineering. Full major status provides access to CENGR courses beyond those required to submit a High Demand Major (HYDM) application.*

### **Frequently Asked Questions:**

#### **What if I miss the application deadline?**

No late applications are accepted. Students who miss the deadline will need to apply at the next opportunity.

#### **Can I apply if I am completing one or more of the required courses in the term in which I am applying?**

Yes, you can be completing courses in the term you are applying. Grades from those courses will be added to your application once grades are posted for the term.

#### **I am a transfer student. When can I apply?**

Upon acceptance to the University, a transfer student is welcome to contact the Academic Office to determine if you have already completed the required courses. If you have or will have the courses completed in the term prior to transfer to UGA, a transfer student may submit a HDM application. Arrangements for completion of the Personal Statement of Purpose need to be made with the Academic Office in sufficient time to meet the close deadline for completing the PSOP at the UGA Testing Center.

#### **If I withdraw from a required course after completing the PSOP but before the application is submitted, what happens?**

The student should not submit the application. The completed PSOP will not be graded, and the student would need to complete another PSOP during a future term he/she plans to apply. This situation does not count as one of the two allowed attempts to apply.

## **I completed some of the required courses via Advanced Placement. How does that impact my application?**

The University does not attach a grade to courses awarded via Advanced Placement or similar credit options. With no grade, these courses have a neutral impact on the GPA's calculated as part of the review process.

## **What happens during the application process?**

We will review your grades in both required General Education and Major Specific courses as well as your personal statement of purpose. Grades for your most recent semester are generally available the week after final exams. Following this review, a decision on your application will be communicated to you via e-mail from the College of Engineering Academic Office.

### **Transfer Courses to take prior to Transferring**

As students plan to register for their coursework prior to transferring, it is crucial to utilize the UGA Transfer Equivalency website as a guide regarding whether or not a course is accepted by UGA. This listing only provides information about courses that have previously been accepted by UGA and is not an all-encompassing list. Please be aware that acceptance of a course by the University is one step in the process. Determining how a transfer course meets degree requirements is the second step. To determine if a course meets degree requirements, a student can always email a course syllabus to their assigned academic advisor. The syllabus will need to be reviewed by the appropriate department (Math, Physics, Chemistry Engineering, Etc.). Engineering courses specifically may need further review before being accepted by the College. Typically courses that are reviewed for incoming CENGR majors include but are not limited to equivalents for courses listed below.

- Engineering Graphics and Design
- Computational Engineering Methods
- Engineering Statics
- Electrical Circuits

Listed below are courses commonly transferred to the University of Georgia for each engineering major that will fulfill engineering degree requirements. These courses are commonly transferred, and this list is not all-encompassing.

### **Transfer Courses for All Engineering Majors**

- ENGL 1101: English Composition 1
- ENGL 1102: English Composition 2

- POLS 1101: US Government
- HIST 2111 or HIST 2112: American History to 1865 or American History after 1865
- MATH 2250: Calculus I for Science and Engineering
- MATH 2260: Calculus II for Science and Engineering
- MATH 2500: Multivariable Calculus or MATH 2270: Calculus III For Science and Engineering
- MATH 2700: Elementary Differential Equations
- PHYS 1211-1211L: Principles of Physics for Scientists and Engineers-Mechanics, Waves, Thermodynamics and Lab
- PHYS 1212- 1212L: Principles of Physics for Scientists and Engineers- Electricity and Magnetism, Optics, Modern Physics
- 9 Hours of World Language and Culture Electives—See the University Bulletin for specific courses that meet the WLC criteria

### **Transfer Courses for Biological and Biochemical Engineering Students**

- CHEM 1211 and CHEM 1211L: Freshman Chemistry I and Lab
- CHEM 1212 and CHEM 1212L: Freshman Chemistry II and Lab
- CHEM 2211 and CHEM 2211L: Modern Organic Chemistry I and Lab
- BCMB 3100: Introductory Biochemistry and Molecular Biology
- MIBO 3500: Introductory Microbiology
- BIOL 1107 and BIOL 1107L: Principles of Biology I and Lab
- BIOL 1108 and BIOL 1108L: Principles of Biology II and Lab (**Biological Engineering Only**)
- COMM 1110: Introduction to Public Speaking

### **Transfer Courses for Environmental Engineering Students**

- CHEM 1211 and CHEM 1211L: Freshman Chemistry I and Lab
- CHEM 1212 and CHEM 1212L: Freshman Chemistry II and Lab
- CHEM 2211 and CHEM 2211L: Modern Organic Chemistry and Lab
- BIOL 1104: Organismal Biology
- ECOL 3500- 3500L: Ecology and Lab
- Humanities and Arts Elective—See the University Bulletin for specific courses that meet the criteria

### **Transfer Courses for Agricultural Engineering Students**

- CHEM 1211 and CHEM 1211L: Freshman Chemistry I and Lab
- COMM 1110: Introduction to Public Speaking
- BIOL 1107 and BIOL 1107L: Principles of Biology I and Lab, CRSS 2010 & CRSS 2010L: Crop Science and Lab, or PBIO 1210 & PBIO 2010L: Principles of Plant Biology and Lab

- ANTH 1102: Introduction to Anthropology, FANR 2200: International Issues in Natural Resources and Conservation, or GEOG 1125: Resources, Society, and the Environment

### **Transfer Courses for Civil Engineering Students**

- CHEM 1211 and CHEM 1211L: Freshman Chemistry I and Lab
- COMM 1110: Introduction to Public Speaking
- ECOL 1000: Ecological Basis for Environmental Issues, MARS 1100: Natural Resources Conservation, or BIOL 1104: Organismal Biology

### **Transfer Courses for Mechanical Engineering Students**

- CHEM 1211 and CHEM 1211L: Freshman Chemistry I and Lab
- COMM 1110: Introduction to Public Speaking
- BIOL 1103: Basic Concepts in Biology, BIOL 1104: Organismal Biology, BIOL 1107 and BIOL 1107L: Principles of Biology I and Lab, or BIOL 1108 and BIOL 1108L: Principles of Biology II and Lab

### **Transfer Courses for Electrical Engineering Students**

- CHEM 1211 and CHEM 1211L: Freshman Chemistry I and Lab
- COMM 1110: Introduction to Public Speaking
- BIOL 1103: Basic Concepts in Biology, BIOL 1104: Organismal Biology, BIOL 1107 and BIOL 1107L: Principles of Biology I and Lab, or BIOL 1108 and BIOL 1108L: Principles of Biology II and Lab

### **Transfer Courses for Computer Systems Engineering Students:**

- MATH 3300: Applied Linear Algebra
- BIOL 1103: Basic Concepts in Biology, BIOL 1104: Organismal Biology, BIOL 1107 and BIOL 1107L: Principles of Biology I and Lab, or BIOL 1108 and BIOL 1108L: Principles of Biology II and Lab
- Humanities and Arts Elective—See the University Bulletin for specific courses that meet the criteria

## **Engineering Student Organizations and Clubs**

### ***American Institute of Chemical Engineers (AIChE)***

*The American Institute of Chemical Engineering at the University of Georgia is a professional organization that unites and promotes collaboration between chemical engineering students. Members participate in industry tours, host speakers, and network with regional chemical engineers.*

### ***American Society of Agricultural and Biological Engineers (ASABE)***

*The Engineering Club is a student branch of the American Society of Agricultural and Biological Engineers. While membership in the national organization is encouraged, it is not required for membership in the club. Some of the purposes of the club include leadership development, service to the community, social activities, design competitions, and career resources. A separate group within the club designs and builds a quarter-scale tractor for a national competition.*

### ***American Society of Civil Engineers (ASCE)***

*The American Society of Civil Engineers is a professional society composed of practicing and aspiring civil engineers whose main purpose is to provide a community of professional interconnection, continuing education, and lifelong resources. The UGA ASCE chapter has quickly established itself as a strong student-run chapter with a high level of membership and activity in one of the fastest growing programs in the College of Engineering at the University of Georgia.*

### ***American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)***

*The American Society of Heating Refrigeration and Air Conditioning Engineers focuses on scientific and educational activities related to the advancement of the sustainable building design technologies in the sciences of heating, refrigerating, and air conditioning engineering and related systems. The organization is devoted to the continuing education of its members and other interested persons through lectures, demonstrations, and publications. ASHRAE also offers career guidance to students and encourages scientific research.*

### ***American Society of Mechanical Engineers (ASME)***

*The American Society of Mechanical Engineers promotes the art, science, and practice of multidisciplinary engineering and allied sciences around the globe. ASME enables collaboration, knowledge sharing, career enrichment, and skills development across all engineering disciplines, toward a goal of helping the global engineering community develop solutions to benefit lives and livelihoods.*

### ***Biomedical Engineering Society (BMES)***

*The Biomedical Engineering Society is the professional society for biomedical engineering and bioengineering. BMES serves as the lead society and professional home for biomedical engineering and bioengineering. Leadership in accreditation, potential licensure, publications, scientific meetings, global programs, and diversity initiatives, as well as commitment to ethics, all serve their mission to promote and enhance knowledge and education in biomedical engineering and bioengineering worldwide and its utilization for human health and well-being.*

### ***Engineers Without Borders (EWB)***

*EWB-UGA's mission is to help provide water, power, sanitation, and education both locally and globally. Their vision is a world in which the communities they serve have the capacity to*

*sustainably meet their basic human needs, and that the EWB-UGA members have enriched global perspectives through the innovative professional educational opportunities that the EWB-UGA program provides.*

### ***Institute of Electrical and Electronics Engineers (IEEE)***

*IEEE is the world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity. As a student branch, their goal is to uphold the organization's mission of fostering the knowledge for technological excellence and furthering the professional development of students in the technology field. Through IEEE's aims of providing students with hands-on technical projects and opportunities to network with other engineers and professionals, they strive to aid in the development of outstanding engineers who will make positive impacts to benefit society.*

### ***National Society of Black Engineers (NSBE)***

*NSBE as a national student and professional based organization, is dedicated to developing intensive programs for increasing interest in technical fields such as science, engineering, and math among pre-college and collegiate students. The objectives of the UGA NSBE Chapter is to stimulate and develop interest in engineering among students; to strive to increase the number of students who choose to major in technical fields at the undergraduate and graduate school levels; to create a support system among black engineering students at UGA; to promote learning and provide academic help to students in need; and to strive to further, within its locality, the purpose and programs of the National Society of Black Engineers. Members of this organization are encouraged to participate in programs that encourage academic excellence, leadership development, and personal growth.*

### ***Society of Automotive Engineers (SAE)***

*SAE at UGA is a group of diverse UGA students of all majors who share an interest in cars and in the automotive industry. SAE holds events, host guest speakers, and work towards future goals that all involve the automobile. SAE is a cast and respected international organization that creates avenues into the automotive industry with its collegiate programs.*

### ***Society of Environmental Engineers***

*The Society of Environmental Engineers fosters academic achievement, professional development, and scholarly and professional relationships between alumni, faculty, and students while promoting healthy communities and stewardship of the environment. This is a student-led organization available to all UGA students and faculty.*

### ***Society of Women Engineers (SWE)***

*The national organization of SWE is the driving force that establishes engineering as a highly desirable career aspiration for women. SWE empowers women to succeed and advance in those aspirations and be recognized for their life-changing contributions and achievements as engineers and leaders. Membership in the professional society is available through the*

*SWE website. The UGA Student Branch of SWE is open to all students, from all disciplines, and is primarily student lead and student driven.*

### **Student Ambassadors**

*Engineering Student Ambassadors work to build awareness of the UGA College of Engineering on campus and across the state. Ambassadors help promote pride in Bulldog Engineering by assisting with college and university-sponsored special events and speaking about academic programs and student opportunities in the college. You'll see Engineering Ambassadors at recognition ceremonies, summer orientation sessions, alumni events, campus visits with prospective students, and at many other events.*

### **Theta Tau**

*Theta Tau is the oldest, largest, and foremost Fraternity for Engineers. Since its founding at the University of Minnesota in 1904, over 35,000 have been initiated over the years. With emphasis on quality and a strong fraternal bond, the Fraternity has chapters only at ABET accredited schools and limits the number of student members in any one of its chapters across the nation.*

### **The International Society for Optics and Photonics (SPIE)**

*SPIE is the International Society for Optics and Photonics. The student chapter is a great group for students interested in optical engineering. SPIE members can attend socials and networking events, take part in conferences and field trips, learn about scholarships, grants and job opportunities, and much more.*

## **Contact Information**

For more information about any College of Engineering programs, please utilize the contact information listed below.

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