College of Engineering

CHEMICAL ENGINEERING

Chemical engineering emerged over a century ago when engineering professionals were needed to design and implement processes for large, commercial scale chemical production. Modern chemical engineering combines knowledge of chemistry and molecular interactions with the discipline of engineering to address problems at both the small scale (designing nanodevices, for example) and the large scale (bringing chemistry out of the lab to the full scale production of items that we use every day). Chemical engineers invent new processes and improve existing ones and design and operate plants and equipment to transform raw feed stocks into useful products across a wide range of industries including agricultural and food-based products, consumer products, fine chemicals, fuels and petrochemicals, pharmaceuticals, plastics and electronic materials.

Pursuing Chemical Engineering at UK

Students enrolled in chemical engineering at the University of Kentucky enjoy the benefits of studying at the Commonwealth's flagship research institution with an energetic faculty committed to each individual student's educational and professional success. Chemical engineering students at UK experience an environment where faculty are readily accessible inside and outside the classroom, and where students have the chance to grow personally and professionally through hands-on research projects, industrial cooperative education and service opportunities. Our alumni follow diverse paths; while many enter industrial positions, others pursue advanced engineering and professional degrees at prestigious institutions across the nation.

In our ABET-accredited program, you'll study a wide range of subjects, including mathematics, chemistry and physics, as well as core engineering topics such as thermodynamics, fluid mechanics, separation processes, heat and mass transfer and chemical reactor design. Our electives address numerous specialized areas of chemical engineering and include courses in advanced materials, biochemical engineering, drug delivery, environmental engineering, fuel science, nanotechnology and polymer processing.

First-Year Engineering Program

The University of Kentucky First-Year Engineering program is designed to remove as much guesswork from your major selection as possible. Instead of pushing through a major you don't like, or adding time and expense by changing majors, you can make an informed choice thanks to hands-on, team experiences that expose you to all of our engineering disciplines from the start. If you are certain about your major, the program is still highly beneficial as it exposes you to other engineering disciplines that you will encounter in the workforce and teaches you skills that you will use throughout the remainder of your engineering curricula. If you are unsure about your major, you may enroll as "undeclared engineering" and choose your major during the second semester.

All incoming freshmen and transfer engineering students take part in the First-Year Engineering program. Freshmen students take a two-semester series which includes an overview of engineering disciplines, computer programming, computer-aided design, MATLAB, engineering design and analysis, project management, ethics in engineering, teamwork and oral and written technical communication. Transfer students complete a course series their first semester focused on similar topics. Studies have shown that students who participate in a First-Year Engineering Program are more successful in upper level engineering courses and are more inclined to graduate with an engineering degree.

Students may directly enroll as pre-engineering students in their chosen major; however, there are minimum admission requirements. Minimum freshman entry requirements are an ACT math score of 23 or a SAT math score of 570. Additionally, students must meet the university's minimum ACT/SAT reading and writing requirements to be admitted to the College of Engineering. Students not eligible to directly enroll in engineering should contact the director of recruitment at visit@engr.uky.edu for alternate pathways.

Experiential Education

Many of our students pursue undergraduate research, working side-by-side with faculty and graduate students on experimental and computational problems. Students can earn academic credit for their efforts, as well as an hourly wage or summer stipend. By working in the hands-on environment of chemical engineering research, students have an opportunity to apply their classroom knowledge solving real-world problems.

FOR MORE INFORMATION, VISIT THESE WEBSITES:

Chemical Engineering: www.engr.uky.edu/cme
College of Engineering: www.engr.uky.edu
Visit Engineering: www.engr.uky.edu/visit
University of Kentucky: www.uky.edu
Admissions: www.uky.edu/admissions
Scholarships: www.uky.edu/scholarships

Chemical Engineering Curriculum Sample

This is a sample list of classes a student will take to pursue a degree in chemical engineering. As part of the chemical engineering curriculum, students must complete the pre-engineering requirements, major requirements and general education coursework, called UK Core.

Note: This sample represents one of several paths to a College of Engineering degree. Consult the departmental websites for details on specific paths.

Freshman Year

Engineering Exploration I and II	3
Fundamentals of Engr Computing	2
Calculus I and II	8
Composition & Communication I and II	6
Chemistry I and Physics I and lab	9
UK Core course	3
Total hours	**31**

Sophomore Year

Process Principles	3
Calculus III and IV	7
Physics II	4
Chemistry II and lab	5
Engineering Thermodynamics	4
Materials Science	3
Computational Tools in Chem Engr	3
Engineering Statistics	3
UK Core course	3
Total hours	**35**

Junior Year

Fluid Mechanics	3
Separation Processes	3
Physical Chemistry for Engineers	3
Technical Writing	3
Organic Chemistry I and II and lab	7
Process Modeling	3
Heat and Mass Transfer	4
Chemical Engineering Lab I	2
Engineering/science elective	3
UK Core course	3
Total hours	**34**

Senior Year

Professionalism, Ethics and Safety	2
Chemical Engineering Lab II	3
Process Design I and II	7
Chemical Reactor Design	3
Process Control	3
Engineering/science electives	9
Supportive elective	3
UK Core course	3
Total hours	**33**

In addition, a substantial percentage of our students undertake co-op placements or summer internships to gain valuable experience in industries that employ chemical engineers. The Engineering Career Development Group is your one-stop shop for assisting you in the development of job, co-op and internship search skills and building career networks to eventually help you secure a rewarding career in your chosen field of study.

Student Involvement

Strong, active professional and honorary student organizations are an integral part of the educational experience in the College of Engineering at UK. The Department of Chemical and Materials Engineering is home to student chapters of the American Institute of Chemical Engineers (AIChE), the International Society for Pharmaceutical Engineering and Omega Chi Epsilon honorary. Members of AIChE gather for regular meetings featuring speakers from industry and academia, participate in field trips, networking and community service opportunities and attend regional and national professional conferences. The AIChE student chapter at UK is known as one of the most active and successful chapters in the nation.

Many of our undergraduates participate in college-wide student organizations, including the Society of Women Engineers, the National Society of Black Engineers, Engineering Student Council and Tau Beta Pi Engineering Honor Society.

Career Prospects in Chemical Engineering

The breadth and analytical rigor of the chemical engineering bachelor's degree makes it one of the most highly valued technical credentials. Starting salaries for chemical engineering graduates are typically among the highest of all majors. Chemical engineers are in demand and work in a wide range of industries. Our chemical engineering alumni have been successful in traditional and alternative energy, biotechnology, environmental engineering, materials processing, pharmaceuticals and more.

The University of Kentucky's chemical engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

Revised July 2017. Information subject to change. For the most up-to-date information on the UK College of Engineering, visit www.engr.uky.edu.

College of Engineering

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