

WHAT IS CHEMICAL ENGINEERING?

Chemical engineers use their knowledge of chemistry, physics, biology, mathematics and economics to develop new processes and products and to improve existing processes. They translate scientists' developments into large-scale production and apply chemistry and materials knowledge to a range of engineered products.

A chemical engineer might specialize in:

- Chemicals manufacturing - refining of petroleum, production of polymers, basic chemicals such as salt, specialty chemicals such as synthetic rubber, perfumes, pharmaceuticals, paint and specialty gases for semiconductor manufacturing.
- Advanced materials manufacturing - production of semiconductor wafers for computers and electronic devices, carbon nanotubes, abrasives, inks, etc.
- Biomedical engineering - development of sensors for early detection of disease and protective coatings for implants and drug delivery, tissue engineering for creation of implants and artificial body parts.
- Pharmaceuticals - development of scale-up processes for new drugs, cell-based processes for biomedical chemicals and materials for safe and effective packaging.
- Renewable Energy - development of materials and catalysts for solar sources, biofuels, fuel cells, hybrid cars, batteries, solid state lighting and large-scale power plants.
- Food processing - advancement of food products and processes including packaged foods, agricultural products, and brewing and distilling.

WHY BECOME A CHEMICAL ENGINEER?

Chemical engineering is a challenging and exciting career. Chemical engineers produce chemicals and materials that impact every aspect of our world from pharmaceuticals to soap, toothpaste to paint, and whiskey to plastics. Today's chemical engineers also contribute to the nanotechnology, bio-medical, electronics and computer revolutions.

Chemical engineers are employed in manufacturing, pharmaceuticals, healthcare, design and construction, pulp and paper, petrochemicals, food processing, specialty chemicals, microelectronics, electronic and advanced materials, polymers, business services, biotechnology, and environmental health and safety industries. In all these companies chemical engineers apply their knowledge, training, communication and teamwork skills to solve the problems of today's industries.

The National Association of Colleges and Employers reported that 2008-09 chemical engineering graduates with a bachelor's degree received annual starting salary offers averaging \$64,902. Offers to those with a master's degree averaged \$70,484. In addition to a relatively stable job market and financial reward, chemical engineers have the gratification that comes from working with the processes of nature to meet the needs of society.



CHEMICAL ENGINEERING AT J.B. SPEED SCHOOL

The Chemical Engineering Department offers a Bachelor of Science Degree, including a cooperative education component, in four years and with one additional year a Master of Engineering Degree. Both the undergraduate and graduate programs are recognized by the Engineering Accreditation Commission of ABET.

Students develop a solid foundation in engineering principles along with a background in the arts, humanities, and social sciences. Laboratory facilities and three semesters of on-the-job learning through the Cooperative Education Program provide hands-on experience with process control, computer-aided engineering, and separation methods. Class topics include material and energy balances, catalysis and chemical reactors, heat and mass transfer, polymers, thermodynamic properties, environmental controls, biotechnology, and materials.

Students have an opportunity to socialize with classmates and faculty, network with practicing chemical engineers, tour industrial sites and participate in national and regional professional meetings through involvement in the American Institute of Chemical Engineers student chapter.



DEPARTMENT HIGHLIGHTS

- Small classes offering personalized instruction
- Opportunities for undergraduate as well as graduate research
- Specialty courses and research in nanotechnology, materials, and environmental issues
- Appointed Kentucky's leading Center for Renewable Energy Research and Environmental Stewardship

For Additional Information:

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