



**5 STEPS TO PROPEL YOUR
CHEMICAL ENGINEERING
CAREER**



*Florida Institute
of Technology*
High Tech with a Human Touch™



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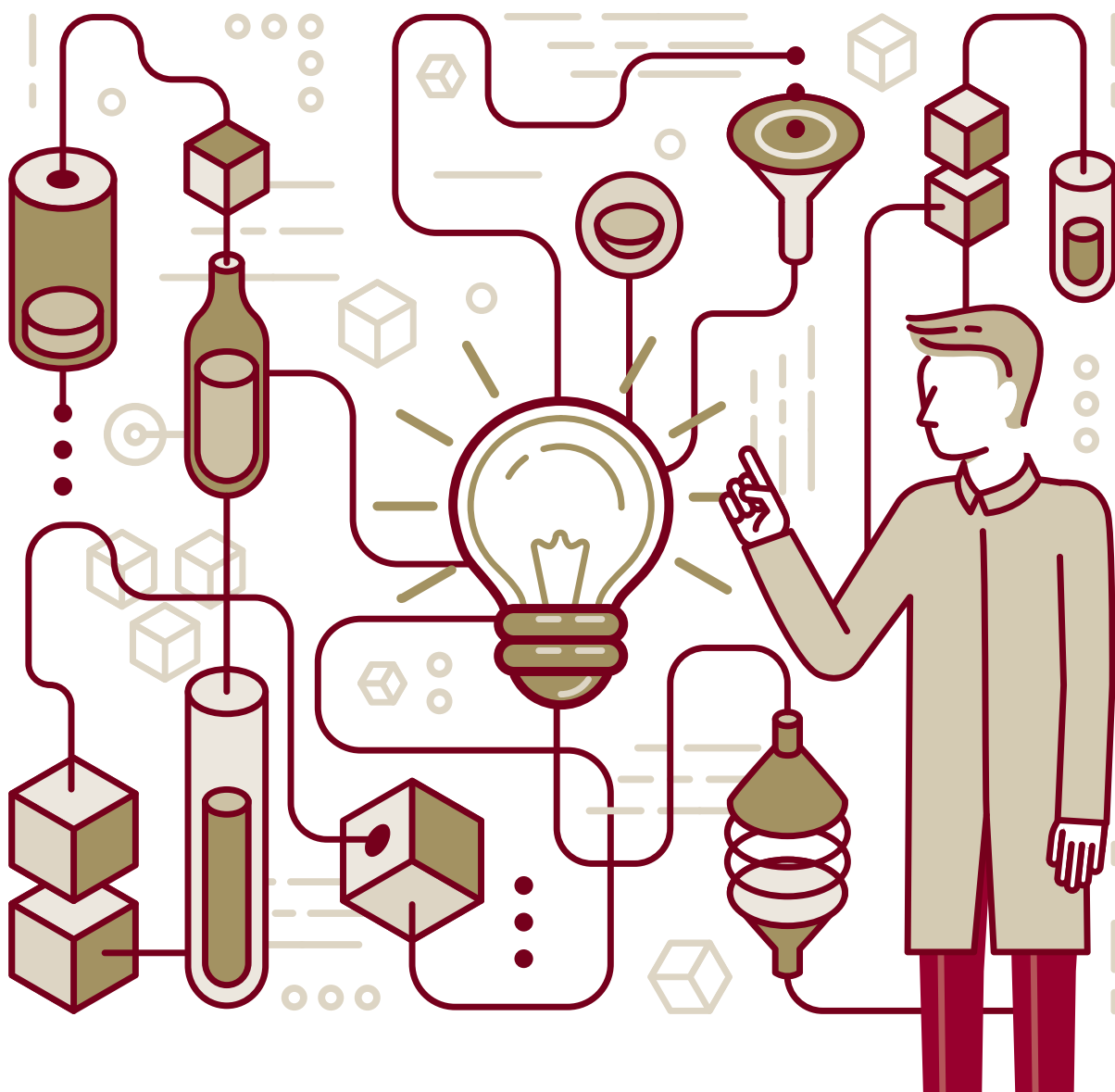
FLORIDA INSTITUTE OF TECHNOLOGY

A career in chemical engineering blends an industry of design and economics with the ingenuity of chemical processes. From food safety to plastics design and alternative energy, chemical engineering is a constantly developing field with diverse career opportunities around the world.

1

FIND AN INDUSTRY THAT APPEALS TO YOU

Career opportunities in chemical engineering cover almost every imaginable field. From designing new tissue reactions to improve human health, to refining materials synthesis and exploring alternative energy sources, chemical engineers are essential to any design team. An undergraduate degree provides your groundwork knowledge, while pursuing your studies at the graduate level opens doors to a career with exciting potential in research and development. From an academic perspective, a chemical engineer applies their knowledge of mathematics and chemistry to solve technical design challenges. In reality, this means the field of chemical engineering influences almost all major industries. Chemical processes are a driving component of modern production, from health and food safety to nuclear engineering and alternative energy. Each of these chemical processes must be designed and monitored by engineers, meaning the scope of study for chemical engineering is as expansive as your ingenuity for design.





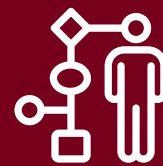
GET SERIOUS ABOUT GRADUATE SCHOOL



As with any advanced field of study, your path to a career in chemical engineering begins with a comprehensive education. Your school of choice should provide a strong groundwork during your undergraduate degree, allowing you to develop your comfort with the formative principles of engineering. Your graduate degree allows you to explore your specialized interests and hone your unique strengths as a chemical engineer. During this time, it is essential that your study includes a focus on field work, paving the way for future research and design in your career. By creating a professional network and developing your hands-on skills over the course of your graduate degree, your transition into the chemical engineering industry can offer you career opportunities ranging from food safety work with Kraft industries to joining the technical design team at NASA.

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BECOME AN R&D EXPERT



The depth of your educational environment will determine much of your success as a chemical engineer, making it essential that your post-secondary institution provide comprehensive instruction. Particularly in a career that centers around research and design, your school of choice must offer ample opportunity to explore challenges and solutions through a hands-on learning approach.

The nature of chemical engineering establishes it as a constantly developing industry—each new foray into health, manufacturing and alternative energy poses new challenges that require equally innovative solutions. As industry understanding of matter and composition evolves, it is essential to have relevant, up-to-date information. Faculty members who are actively involved in research programs give students insight into the reality of a career in chemical engineering. The instructors' developing knowledge ensures that each new discovery is brought back to the classroom, providing education that expands with the industry itself.

Equally as important as field work by faculty members is the opportunity for students to conduct research themselves. An understanding of how to conduct research not only enhances knowledge of the individual subject, but forms a groundwork for more advanced exploration further into your career. The ability to conduct research is, in itself, an essential skill that will be developed throughout your graduate program. Programs that take a creative, hands-on approach encourage a balance between traditional knowledge and exploration, creating a more comprehensive chemical engineering education. Mentorship programs also allow students to form connections with industry professionals who provide guidance and insight into their chemical engineering career. This forms the foundation of a network that supports you and your development throughout your education and into your post-graduate career.

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BECOME A SPECIALIST

The path to a career in chemical engineering begins with a solid foundation at the undergraduate level. Once your knowledge of chemistry, mathematics and design is established, your master's degree allows you to explore your unique interests to develop a program for specialization. While a chemical engineering degree can be applied to a vast expanse of industries, there are several specialized industries that form the core opportunities of the field.

Environmental Engineering

One of the most rapidly developing fields in chemical engineering, this branch focuses on solving the challenges surrounding our environment. Prominent here is a focus on pollution control, sustainability, and new solutions for reduction and reuse of destructive materials. This can include better wastewater treatment, new approaches to waste and recycling, and the creation of more efficient filters for materials production.

Alternative Energies

While also focused on the creation of environmentally sustainable design, alternative energies differs from environmental engineering in that it centers around the development of renewable energy sources. This includes the refinement of batteries and solar technologies, as well as research into the potential for new fuel sources. Biofuels, as well as hydrogen and fuel cell technologies and even wind based technologies all require the input of a chemical engineer.

Materials Synthesis

The creation of new materials is another branch of chemical engineering with vast scope. On the one hand, materials synthesis can be administered to functional industrial fields. This includes plastics and metal production, and the synthesis of new polymers to improve industry and everyday life. On the other hand, materials synthesis can be also applied to delicate processes such as nanoparticles, and used to create materials for further research and sensitive technological design. Ranging from biomaterials to ceramics, materials synthesis centers around the creation of new substances to improve industry and development.

Biomedical Chemical Engineering

Chemical engineering is rarely limited to one scientific branch—in the overlap of chemistry and biomedicine lies the specialization in biomaterials and tissue engineering. This can include physical design to provide support for tissue, or the creation of chemical materials to stimulate tissue action and growth. Including noninvasive technologies, the use of chemical engineering in biomedicine focuses on designing chemical communication with tissue to promote a desired physical response.

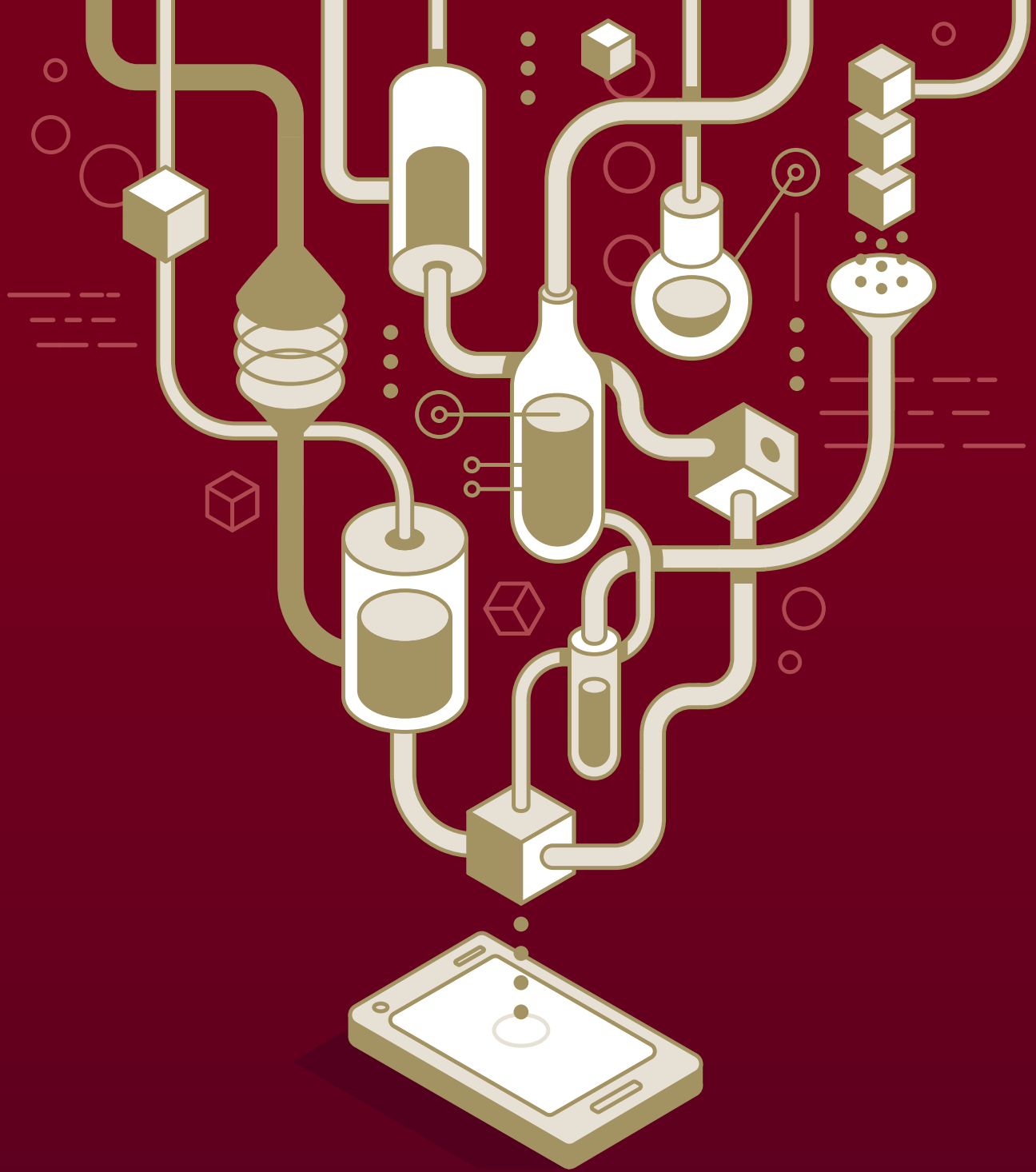
Materials Processing

Another vast element of chemical engineering, materials processing studies the behavior of materials and focuses on designing solutions to the challenges that arise. Specialization includes the study of dynamic processes and control methods, as well as research into separation of materials and safer, more efficient strategies for transportation. This can include biomaterials, hazardous chemicals, and innovative designs in the oil and gas industry. Understanding the nature of various materials and introducing systems to more effectively manage their behavior is an essential component of chemical engineering.

Computer-aided Design

In order to understand the behavior of the world around us, it is essential that we reduce that world to a smaller scale to better apply design principles. With the aid of a computer, chemical engineers can design models to understand and replicate biological and industrial systems. This can apply to everything from healthcare to processing control, and requires an interest and ability for advanced computer technology. A specialization in computer-aided design allows you to apply your knowledge of chemical engineering to design models of tissues, plan space or nuclear engineering, and digitally control pipeline flow.

While these specializations are some of the most common within chemical engineering, they fall far from covering the extent of the opportunities. The principles of chemical engineering influence almost every aspect of life, and expertise is required in a diverse range of industrial fields. Whether your passion lies with computer technology, food safety, or environmental protection, a graduate degree in chemical engineering opens doors to an innovative career in research and design.



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GET PUBLISHED



Once you have had the opportunity to explore your passions in chemical engineering and specialize your study, it is essential to expand upon and share that knowledge. The facilities provided by your post-secondary institution must be able to support research at a high level, allowing you to add to the body of chemical engineering knowledge.

As well as providing an environment for students to perform research, outreach programs help form professional industry relationships. Studies developed through these programs empower students to publish their research in a range of engineering journals. Results from these explorations can also be presented at industry conferences, allowing students to establish their professional reputations as industry researchers even before graduation.

Hands-on research is perhaps the most valuable component of a well-rounded graduate degree. Not only does it form the groundwork to become an in-demand successful researcher and complex problem-solver, it also affords valuable networking experiences to become an industry thought leader. Research is the cornerstone to a successful career in chemical engineering, making the research facilities of your post-secondary institution an essential component when determining where to study.



GETTING THE RIGHT START



At Florida Institute of Technology, your chemical engineering career path is supported and developed each step of the way. Students pursuing a master's degree in chemical engineering have access to advanced instrumentation and laboratories to explore their investigations. Students have generated studies from nanotechnology to ocular synthesis, using the advanced facilities to explore their individual scientific passions.

However, the educational environment is more than just classroom teaching—it offers real industry experience and research opportunities that maximize time spent pursuing your master's degree. Beyond the campus, Florida Tech provides opportunities to access facilities in the surrounding community, including the NASA Kennedy Space Center, Cape Canaveral Air Force Station and Florida Solar Energy Center.

The active faculty research team provides insight into new developments in the industry and ensures that your education remains cutting edge. Mentorship, communication and high-level facilities foster your ability to conduct a variety of studies and provide the platform for you to publish your research. Florida Tech students are encouraged to work with instructors to develop individual research programs, allowing them the opportunity to explore their specialized program through a close-knit mentorship environment.

Outreach programs with the local scientific community build your professional network, allowing you to establish your reputation in the industry even before you graduate. Florida Tech students have established themselves in chemical engineering careers with some of the most high profile companies around the world, including Kraft industries, IBM, Mobil and NASA.



EARN A MASTER'S DEGREE IN CHEMICAL ENGINEERING

If you are interested in developing your chemical engineering expertise and want to enhance your career, consider earning a master's degree in chemical engineering from Florida Institute of Technology. Your expertise will only grow as you master valuable skills and competencies that can translate into a rewarding career as a successful chemical engineer.

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