



# CHEMICAL ENGINEERING

Chemical engineering combines the principles of chemistry, physics, and biology with the design skills of engineering to create new chemical and biochemical processes. These processes usually take the form of either reactions or separations, and chemical engineers might use these techniques to convert raw materials like sand, metal ore, crude, and natural gas into all of the products we use every day.

## What Do Chemical Engineers Do?

Chemical engineers apply the principles of chemistry, biology, physics, and math to solve problems that involve the production or use of chemicals, fuel, drugs, food, and many other products. They design processes and equipment for large-scale manufacturing, plan and test production methods and byproducts treatment, and direct facility operations. Some chemical engineers, known as process engineers, specialize in a particular process, such as oxidation (a reaction of oxygen with chemicals to make other chemicals) or polymerization (making plastics and resins). Others specialize in a particular field, such as nanomaterials (extremely small substances) or biological engineering. Still others specialize in developing specific products. In addition, chemical engineers work in the production of energy, electronics, food, clothing, and paper.

## DOW Unit Operations Laboratory

The Dow Unit Operations Laboratory serves as the capstone hands-on experience for chemical engineering students. During the junior-year lab, students focus on engineering measurements, experimental statistics, and technical communication skills. They also learn safe working practices that will be used throughout their professional career.

Supported by industry-experienced professionals and tenure-track faculty, students work in teams during their senior year. They also practice engineering methods while continuing to build skills needed for the workplace or further academic pursuits. In both junior- and senior-year labs, problems shift from textbook to real-world ambiguity, demanding strong development of both technical and communications skills.

### PROGRAM FACTS

**2020–2021 Enrollment:** 618 Students

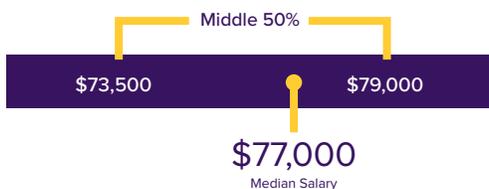
#### Student Organization:

American Institute of Chemical Engineers (AIChE)

LSU's Department of Chemical Engineering is the largest in the state. With close proximity to hundreds of chemical, oil, and gas companies, we help our students gain hands-on experience through internships, co-ops, research involvement, and job opportunities.

### GRADUATE STARTING SALARIES

Median full-time in field salary info for graduates of the last three years



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### RESEARCH SPOTLIGHT

Associate Professor James Dorman performs research into magnetic field-driven catalysis. This is the use of radio waves to heat magnetic particles to high temperatures. It uses renewable energy and limits heat loss that is normally seen with thermal heating. Dorman studies this because high temperatures at catalyst surfaces allow his research group to perform the reaction at lower reactor temperatures. The group uses this for recycling plastic, for example, to control the products and prevent complete destruction of the hydrocarbons.

# Chemical Engineering CURRICULUM OVERVIEW

YEAR 1	YEAR 2	YEAR 3	YEAR 4
Introduction to Chemical Engineering	Material and Energy Balances	Momentum Transfer	Unit Operations Design
General Chemistry I	Numerical Methods and Programming	Reaction Engineering	Unit Operations Design Lab
General Chemistry II	Thermodynamics	Heat and Mass Transfer	Process Dynamics (Controls)
General Chemistry Lab	Organic Chemistry I	Measurements Lab (Junior Lab)	Process Design (Plant Design)
Physics I: Particle Mechanics	Physics III: Fields: Gravity, Electricity, and Magnetism	Intro to Design and Process Safety	Concentration Elective
Biology for Science Majors	Differential Equations	Heterogeneous Equilibrium	Concentration Elective
Calculus I	Calculus III	Concentration Elective	Concentration Elective
Calculus II	General Ed: Humanities	Materials of Engineering	General Ed: Arts
General Ed: English Comp I	General Ed: English Comp II	Physical Chemistry II	General Ed: Humanities
General Ed: Humanities	Economics	Organic Chemistry II	General Ed: Social Sciences
		Organic Chemistry Lab	

## LEGEND

Major-specific Engineering

Other Engineering

Science

Math

General Education