

CHEMICAL ENGINEERING MAJOR

Program Director: Ganesh Sriram, Ph.D.

Students in the Department of Chemical and Biomolecular Engineering at the University of Maryland learn to use a combination of mathematical, physical, chemical, and biological science concepts within a rigorous engineering design framework, graduating with a unique set of skills highly valued by a wide range of employers in industry, academia, and the government. The wide breadth of this profession and the Department's unique strengths in nanotechnology and biotechnology prepare our students for outstanding careers.

Because of the wide range of ultimate applications, the chemical engineer finds interesting and diverse career opportunities in such varied fields as chemical (inorganic and organic), food processing and manufacturing, metallurgical, polymer, energy conversion, environmental engineering, petroleum (refining, production, or petrochemical), and pharmaceutical industries. Additional opportunities are presented by the research and development activities of many public and private research institutes and all government agencies. Our graduates have taken jobs with companies like DuPont, ExxonMobil, Proctor & Gamble, the Food and Drug Administration, and the Department of Defense. On top of all the options and opportunities, chemical and biomolecular engineers have traditionally ranked at or near the top of starting salaries among all of the engineering professions.

Courses offered by this department may be found under the following acronyms: ENCH & CHBE

The Bachelor of Science degree in Chemical Engineering is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (<http://www.abet.org>).

Program Objectives

The objectives of the Chemical Engineering degree program are to produce graduates who:

- Succeed in professional chemical engineering practice and in the pursuit of advanced degrees.
- Excel in traditional chemical engineering careers and diverse areas such as biotechnology, nanotechnology, medicine, law or business.
- Adapt to new technologies, with a strong ethical foundation that serves them throughout their careers.

Program Learning Outcomes

Students are expected to fully engage with the curriculum and the opportunities presented for learning and research. Having completed the degree program, students should have acquired the following knowledge and skills:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Requirements

Important: This section contains requirements for incoming freshman or transfer students entering the B.S. program in Chemical and Biomolecular Engineering Fall 2018 and later. For students entering the program before Fall 2018 see requirements here (<http://www.chbe.umd.edu/undergraduate/fall2010tospring2012/program/>).

The undergraduate program is designed to be completed in four years.

It is important to follow the sample program as closely as possible, as nearly all CHBE classes are offered only once a year. All Chemical and Biomolecular Engineering students must participate in an advising session prior to registering each semester. Students are assigned a faculty advisor at the start of their first semester in the major. Questions about the undergraduate program may be sent to Kathy Lopresti at lopresti@umd.edu or Amanda Alicea at aalicea@umd.edu.

Courses appearing in bold are offered by the Department of Chemical and Biomolecular Engineering.

Freshman Year			
First Semester	Credits	Second Semester	Credits
ENES100		3 ENGL101	3
MATH140		4 MATH141	4
CHEM135		3 PHYS161	3
CHEM136		1 BIOE120	3
General Education		3 CHBE101 ¹	3
		14	16
Sophomore Year			
First Semester	Credits	Second Semester	Credits
MATH241		4 MATH246	3
PHYS260		3 PHYS270	3
PHYS261		1 PHYS271	1
CHEM231		3 CHEM241	3
CHEM232		1 CHEM242	1
CHBE250 ¹		3 CHBE302 ¹	3
CHBE301 ¹		3 General Education	3
		18	17

Junior Year			
First Semester	Credits	Second Semester	Credits
CHBE410 ¹		3 BCHM461 or 463 ¹ if BCHM 461 is taken, it must be followed by BCHM 462, which can be counted as an out-of-major technical elective	3
CHBE422 ¹		3 Select one of the following:	3
CHBE440 ¹		3 CHBE457 ¹	
CHEM272		2 ENMA300	
General Education		3 CHBE424 ¹	3
Professional Writing		3 CHBE426 ¹	3
		CHBE333 ¹	1
		General Education	3
	17		16
Senior Year			
First Semester	Credits	Second Semester	Credits
CHBE437 ¹		3 CHBE446 ¹	3
CHBE442 ¹		3 Technical Elective ²	3
CHBE444 ¹		3 Technical Elective ²	3
Technical Elective ²		3 General Education	3
General Education		3 General Education	3
	15		15
Total Credits 128			

¹ Offered by the Department of Chemical and Biomolecular Engineering

² Technical Elective list of approved courses: <http://www.chbe.umd.edu/undergraduate/current> (<http://www.chbe.umd.edu/undergraduate/current/>)

Degree Credits: 128 credits and fulfillment of all departmental, college, and university requirements with a cumulative grade point average of 2.0.

Four Year Plan

Click here (<https://eng.umd.edu/advising/four-year-plans/>) for roadmaps for four-year plans in the A. James Clark School of Engineering.

Additional information on developing a four-year academic plan can be found on the following pages:

- [4yearplans.umd.edu \(http://4yearplans.umd.edu/\)](http://4yearplans.umd.edu/)
- the Student Academic Success-Degree Completion Policy (<https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/>) section of this catalog