BACHELOR OF SCIENCE IN CHEMICAL AND BIOMOLECULAR ENGINEERING

The Bachelor of Science in Chemical and Biomolecular Engineering provides the basics of biomolecular engineering but allows flexibility for the student to pursue other areas of chemical engineering such as microelectronics, materials, and the environment.

The curriculum has two options. The Biotechnology Option is for students who wish to focus their education on the biomolecular aspects of chemical and biomolecular engineering. This option includes the core chemical engineering courses, specialized biomolecular engineering courses, biochemistry, and technical electives focused in the biotechnology area. The Standard Option provides the basics of biomolecular engineering but allows much more flexibility for the student to pursue other areas of chemical engineering such as microelectronics, materials, and the environment. Special opportunities exist for students wishing to pursue minors or certificates in fields of particular interest, and students are encouraged to explore the frontiers of knowledge through involvement in faculty-directed research.

Program Objectives

The mission of the School of Chemical and Biomolecular Engineering is to prepare students with the intellectual basis to be educated citizens, to provide students with the intellectual basis to be educated citizens, to advance the science and technology that form the basis of chemical and biomolecular engineering. In pursuit of this mission, the School has adopted the following:

Program Educational Objectives

1. Graduates will demonstrate proficiency in the principles and methods essential to modern chemical and biomolecular engineering.
2. Graduates will demonstrate broadened perspectives regarding social issues and responsibilities, ethics, and professionalism.
3. Graduates will be recognized for excellence and leadership and selected for high-quality industrial, academic, government, and other professional positions.
4. Graduates will demonstrate an understanding of the global nature of engineering practice and business activities.
5. Graduates will understand the importance of further professional growth through continuing education and research.

Program Outcomes

In pursuit of its educational objectives, the School has adopted the following program outcomes:

1. Students will demonstrate the ability to apply knowledge of mathematics, science, and engineering.
2. Students will demonstrate the ability to design and conduct experiments, as well as to analyze and interpret data.
3. Students will demonstrate the ability to design a system, component, product, and/or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. Students will demonstrate an ability to lead and function on multidisciplinary teams.
5. Students will demonstrate an ability to identify, formulate, and solve engineering problems.
6. Students will demonstrate an understanding of professional and ethical responsibility.
7. Students will demonstrate the ability to communicate effectively.
8. Students will demonstrate a breadth in education that facilitates understanding the impact of engineering solutions in a global, economic, environmental, and societal context.
9. Students will demonstrate recognition of the need for and an ability to engage in lifelong learning.
10. Students will demonstrate knowledge of contemporary issues, especially as related to chemical engineering practice.
11. Students will demonstrate the ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
12. Students will have an understanding of the chemical engineering profession as obtained through professional organizations, cooperative education, internships, undergraduate research, and/or required laboratory courses.
13. Students will have a thorough grounding in the basic sciences including chemistry, physics, and biology appropriate to the program objectives.
14. Students will demonstrate knowledge in the applications of these basic sciences to enable graduates to design, analyze, and control physical, chemical, and biological processes consistent with the program's educational objectives.

Cooperative Option

Since 1912, Georgia Tech has offered a five-year Undergraduate Cooperative Program to those students who wish to combine career-related experience with classroom studies. The program is the fourth oldest of its kind in the world and the largest optional co-op program in the country. Traditionally, 35 to 40 percent of chemical and biomolecular engineering students participate in the program each year at Georgia Tech.

Students alternate between industrial assignments and classroom studies until they complete four or five semesters of work. Co-op students with chemical and biomolecular engineering majors complete the same coursework on campus that is completed by regular four-year students. Most co-op students begin the program as sophomores and are classified as full-time students regardless of whether they are attending classes on campus or are working full time at an employer’s location.

Students who participate in the program have the opportunity to develop career interests, become more confident in their career choices, and develop human relation skills through their work experience. Graduates of the program receive a bachelor’s degree with a Cooperative Plan designation.
International Plan
The International Plan is a challenging and coherent academic program for undergraduates emphasizing global competence within the context of the aerospace engineering major. This program has specific language requirements. There are also coursework requirements related to history, global economy, international culture, and residential foreign experience. Refer to www.internationalplan.gatech.edu for the general requirements of the International Plan. These requirements may be satisfied by carefully selecting the humanities, social sciences, and free elective hours available in the program, in consultation with a faculty advisor.

Research Option
The Chemical and Biomolecular Engineering undergraduate program offers an undergraduate Research Option that allows students to participate in undergraduate research and complete an undergraduate thesis. The words “Research Option” will appear on the transcript of each student completing the requirements to indicate that the student has had substantial, in-depth research experience.

BS/MS Chemical and Biomolecular Engineering
The program seeks to engage undergraduate students at Georgia Tech who indicate an interest in, and ability for, additional education beyond the BS degree. Students with significant AP credit will be especially well positioned to take full advantage of this opportunity. Students in the BS/MS Program will remain undergraduates until they meet the requirements for the BS degree; after which, their status will change to graduate student.

Students are eligible to apply for the program after completion of thirty semester credit hours at Georgia Tech (i.e., at the end of freshman year). As a practical matter, it is recommended that students apply to the program immediately after completion of CHBE 3110. Students must have a Georgia Tech GPA of 3.5 or higher for admission into the program.

Admission into the program will be based on academic performance at Georgia Tech, as well as the potential for advanced study and/or research as assessed from the essay and recommendation letter.

Continuation in the program will require the student to maintain a GPA of 3.0 or higher. This GPA requirement should not deter students from taking challenging courses. The program will not penalize students who opt out after receiving the BS degree. Additionally, students participating in the program will be eligible for the six credit hour Graduate Course Option (http://www.catalog.gatech.edu/academics/undergraduate/credit-tests-scores/undergraduate-students-taking-graduate-courses).

Additional Information (http://www.chbe.gatech.edu/programs/bs-ms)