BIOMEDICAL ENGINEERING, MS

The Master of Science (M.S.) degree program in Biomedical Engineering aims to address the growing demand for skilled professionals in the rapidly advancing field of healthcare technology. By offering a comprehensive education in this interdisciplinary domain, we seek to equip students with the knowledge and skills necessary to meet critical industry needs. This MS program features an interdisciplinary curriculum designed to provide students with both a broad and in-depth understanding of the biomedical field. It familiarizes students with emerging techniques, tools, and materials in biomedical engineering and prepares them for professional roles in the biomedical or biotechnology industries. The designed curriculum emphasizes areas such as Biomaterials, Tissue Engineering, Drug Delivery, Polymers/Plastics, Nanotechnology, and Bioprocessing, aligning with the faculty's expertise and research areas in the Department.

Admissions

Admission is contingent upon recommendation by the graduate faculty of the Department of Chemical and Biological Engineering. Special opportunities are available for students with undergraduate degrees in fields other than chemical engineering.

Curricular Requirements

The BME MS program requires 30 credits total of graduate coursework (500 and 600 level); including 16 credits of core courses related to basic biomedical engineering, 14 credits of electives (*e.g.,* elective courses, experiential learning of BME related research courses, approved electives from other discipline, etc.). A Capstone Experience is also built into the requirement to broaden and enhance the student learning experience through (1) a mentored grading experience (CHE 593) to enhance learning in biomedical engineering topics, and (2) the preparation and delivery of a technical seminar (CHE 595) to the departmental faculty and graduate students focused on a biomedical engineering related topic. The Capstone Experience can also include hands-on research experience in faculty laboratories, internships and shadowing opportunities involving biomedical engineering companies and health professionals, technical literature reviews within the biomedical engineering field, development of biomedical engineering design models, etc., As students progress through the program, they will also have to meet other requirements besides satisfactory completion of courses, such as participation in graduate research seminars, no course receiving a grade below C, no more than 6 hours of course credits of Independent Study, etc.

Core Courses		**Hours**
CHE 545	Intro to Biochemical Engr	3
CHE 551	Adv Thermodynamics I	3
CHE 552	Transport Phenomena	3
CHE 555	Biostatistics	3
CHE 593	Chem & Biol Engr Practicum	3
CHE 595	Seminar	1
Total Hours		**16**

Elective Courses		**Hours**
Must complete 14 hours of electives.		
CHE 512	Polymer Materials Engineering	3
CHE 516	Stem Cell Bioengineering	3
CHE 518	Tissue Engineering	3
CHE 520	Microbial Engineering	3
CHE 522	Metabolic Engineering	3
CHE 524	Cancer Bioengineering	3
CHE 526	Biomaterials	3
CHE 528	Biomechanics	3
CHE 592	Special Problems	3
CHE 598	Non-Thesis Research	1 to 6

Transfer Credit

Transfer credit information.

Comprehensive Exam/Capstone

The “Capstone Experience” consists of two required components:

1. First, a research presentation must be delivered to the faculty. The research presentation can be based on a literature review of a chemical engineering topic or a presentation of hands-on research results. The student must register for 1 hour of CHE 595 Seminar during the semester of the presentation (this 1 hour counts towards the total of 30 credit hours of coursework).
2. The second component is a mentored grading experience, CHE 593 (3 hr.), and this will count towards the 30 credit hours of coursework. The student will gain first-hand experience with several aspects of the chemical engineering educational process (homework design, grading, test preparation, etc.).

Plan I - Thesis Process Requirement

Candidates for the master’s degree under Plan I must earn a minimum of 24 semester hours of credit in coursework and write a thesis (a minimum of six semester hours of thesis research required).

- A minimum of 24 credit hours of coursework is required.
- A minimum of six hours of thesis research is required.
- A student’s curriculum and thesis must be approved by the student’s graduate advisory committee. The student must pass a final comprehensive examination, which is typically a presentation and defense of the thesis. In addition, the student must satisfy all University requirements defined in the current edition of The University of Alabama Graduate Catalog.

Plan II – Non-Thesis Process Requirements

Candidates for the master’s degree under Plan II must earn a minimum of 30 semester hours of credit and complete a culminating or “Capstone experience” as described below.

- A minimum of 30 credit hours of coursework is required.
- A student’s curriculum must be approved by the student’s graduate advisory committee. The graduate advisory committee must also approve the submission of a manuscript, a conference proceeding or a graduate seminar presentation. This activity shall constitute The University of Alabama Graduate School culminating experience requirement for a MS Plan II degree in chemical engineering.

Time Limits for Degree Completion Requirements

Information on time limits for degree completion.

Academic Misconduct Information

Academic misconduct information.

Withdrawals and Leave of Absence Information

Information on withdrawals and leave of absence.

Academic Grievances Information

Academic grievances information.

Grades and Academic Standing

Grades and academic standing information.

Graduate School Deadlines Information

Graduate School Deadlines information.

Application For Graduation Information

Application for graduation information.