

Emphasis - Biotechnology

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B.S.Ch.E. in Chemical Engineering **Description**

The B.S. in chemical engineering provides the student with a fundamental knowledge of chemical engineering science and prepares graduates for a variety of careers in industry and government, or for advanced study in engineering, business, or professional school.

Minimum Total Credit Hours: 128

Goals/Mission Statement

Graduates from the Department of Chemical Engineering of the University of Mississippi are:

1. Globally competitive in the professional world
2. Prepared for success in their chosen career or in continued education
3. Equipped with flexible problem solving skills to address complex issues in society.

As students progress through the B.S ChE Program, they develop a set of abilities that comprise the program outcomes. These outcomes are consistent with and encompass those proscribed by our accrediting organization.

Program Outcomes - Our students will demonstrate an:

- Ability to apply knowledge of math, engineering, and science
- Ability to design and conduct experiments
- Ability to analyze and interpret data
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Ability to function on multi-disciplinary teams
- Ability to identify, formulate, and solve engineering problems
- Understanding of professional and ethical responsibility
- Ability to communicate effectively
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- Recognition of the need for, and an ability to engage in life-long learning
- Knowledge of contemporary issues
- Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

General Education Requirements

In addition to the courses specified by the School of Engineering general education requirements, the following are required: Math 263-264 and Math 353; laboratory science to be fulfilled by Chem 105, 106, 115, 116 and Phys 211, 212, 221, 222. Students must complete 3 hours of fine arts (nonperforming) and 15 of liberal arts course work. The liberal arts course work must include one sequential work in the humanities and one sequential work in the social/behavioral sciences. "Sequential work" is defined as two or more courses from the same department using the acceptable courses in the humanities and social/behavioral sciences as defined in the School of Engineering general education requirements. One sequential work (either humanities or social/behavioral science) must contain a 300 or higher course number. If the student meets the fine arts, humanities, and social/behavioral science work defined above in 15 credits, then the final 3 credits of liberal arts work may be chosen as defined in the "3 credits of additional general education course work" located in the School of Engineering general education requirements with the exception that speech courses may not be used to satisfy any of these required 18 credits.

Examples: Fr 201, Fr 202, Southern Studies; Psy 201, 301; Mus 104 Rel 101, Phil 103, Phil 328, Pol 101, Pol 102, Thea 201 His 101, His 102; Soc 101, Soc 301, Bus 250; Art 201

Course Requirements

Specific requirements for the individualized emphasis in chemical engineering are as follows: Chem 221, 222, 225, advanced chemistry (defined below); Csci 251 or Engr 309, 310, 313, 321, 322, 362; Ch E 103, 104, 307, 308, 317, 345, 411, 417, 421, 423, 445, 446, 451, 452, 511; technical electives to include three 3-hour electives of 300 or higher course number from among engineering, science, or mathematics. Any of the following will satisfy the advanced chemistry requirement: Chem 334, Chem 471, Ch E 545, G E 503, Engr 540, and Manf 350. The following alternative courses may satisfy course requirements as specified: • Alternatives to Ch E 103 and 104: Engr 100, Manf 150, and Manf 252 • Alternative to Ch E 452: The combination of Ch E 460 and Ch E 461 • Alternatives for 300-level technical electives: Manf 251, Manf 253, Manf 254, and the combination of Bisc 160, 161, 162, and 163. In the case of the Bisc 160-163 series, the student must take all 8 credits to fulfill the requirement for one 3-credit technical elective. A maximum of 3 credits of Ch E 330 may be used to satisfy the technical elective requirements.

Emphases in Chemical Engineering: Alternative to the individualized emphasis in chemical engineering (defined above), a student may choose to obtain a B.S. in Chemical Engineering with one or more of the following four emphases: biotechnology, environmental, materials, and manufacturing (in collaboration with the Center for Manufacturing Excellence). The same general education and course requirements (defined above) apply to all emphases in chemical engineering. The taking of specific advanced chemistry and elective courses satisfy an emphasis requirement as defined below.

Other Academic Requirements

Students in the Department of Chemical Engineering are encouraged to take the Fundamentals of Engineering examination prior to awarding of the baccalaureate degree.



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Biological Options - Two Options Biotechnology and Pre-Medical Biotechnology Option (adds 13 credits for Total of 129 credits) CHEM 334 Biophysical Chemistry 3 credits PHAR 331 Basic Pharmaceutics 4 credits Ch E 520 Biochemical Engineering 3 credits 300 level or higher Technical Elective (i.e. CHEM 580) or Undergraduate Research (ChE 3xx) 3 credits

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The academic regulations for this degree program, as entered in the University of Mississippi Catalog, are in effect for the current or selected academic year and semester. The University of Mississippi reserves the right to 1) change or withdraw courses; 2) change rules for registration, instruction, and graduation; and 3) change other regulations affecting the student body at any time.

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General Education

REQUIREMENT	HOURS	DESCRIPTION
Chem 105	3	Complete Chem 105 with a passing grade.
Chem 106	3	Complete Chem 106 with a passing grade.
Chem 115	1	Complete Chem 115 with a passing grade.
Chem 116	1	Complete Chem 116 with a passing grade.
First Year Writing I	3	Complete Hon 101 , Writ 100 or Writ 101 with a passing grade.
First Year Writing II	3	Complete Hon 102 , Liba 102 , or Writ 102 with a passing grade.
Math 261	3	Complete Math 261 with a passing grade.
Math 262	3	Complete Math 262 with a passing grade.
Math 263	3	Complete Math 263 with a passing grade.
Math 264	3	Complete Math 264 with a passing grade.
Math 353	3	Complete Math 353 with a passing grade.
Phys 211	3	Complete Phys 211 with a passing grade.
Phys 212	3	Complete Phys 212 with a passing grade.
Phys 221	1	Complete Phys 221 with a passing grade.
Phys 222	1	Complete Phys 222 with a passing grade.
3 hrs fine arts	3	Student must successfully complete 3 hours in the fine arts. The course may be chosen from art history, art appreciation, and criticism of art, dance, music, and theatre arts. Courses emphasizing the enhancement of skills and performance are not acceptable.
Serial humanities	6	Complete 6 hrs (from the same department) of humanities choosing from course work in classics, literature, history, philosophy, religion, Southern Studies, African American Studies, and Gender Studies.
Serial social science	6	Complete 6 hours (from the same department) of social sciences choosing from the following; economics, anthropology, political science, psychology, and sociology. Psy 202 and Econ 230 are excluded from these options.
Add'l 300+ level hum/soc sci	12	Complete an additional 3 hours of advanced course work (300 level or above) in the area selected for the humanities or social sciences.

Major Requirements

REQUIREMENT	HOURS	DESCRIPTION
Ch E 345	3	Complete Ch E 345 with a passing grade.
Ch E 317	3	Complete Ch E 317 with a passing grade.
Ch E 308	2	Complete Ch E 308 with a passing grade.
Ch E 307	2	Complete Ch E 307 with a passing grade.
Ch E 103/104 or approved course	2	Complete Ch E 103 and Ch E 104 . As an alternative, students may complete one one of the following courses: Engr 100 , Manf 150 or Manf 252 . Coursework must be completed with a passing grade.
Ch E 411	1	Complete Ch E 411 with a passing grade.
Ch E 417	3	Complete Ch E 417 with a passing grade.



REQUIREMENT	HOURS	DESCRIPTION
Ch E 421	3	Complete Ch E 421 with a passing grade.
Ch E 423	3	Complete Ch E 423 with a passing grade.
Ch E 445	2	Complete Ch E 445 with a passing grade.
Ch E 446	2	Complete Ch E 446 with a passing grade.
Ch E 451	4	Complete Ch E 451 with a passing grade.
Ch E 452 or Ch E 460/461	3	Complete either Ch E 452 or Ch E 460/461 with a passing grade.
Ch E 511	3	Complete Ch E 511 with a passing grade.
School of Engineering GPA		Must be at least a 2.0
Enroll in a BSChE emphasis		Enroll in an emphasis in BSChE program.

Major Requirements II

REQUIREMENT	HOURS	DESCRIPTION
Chem 225	1	Complete Chem 225 with a passing grade.
Chem 222	3	Complete Chem 222 with a passing grade.
Chem 221	3	Complete Chem 221 with a passing grade.
Engr 310	3	Complete Engr 310 with a passing grade.
Engr 313	3	Complete Engr 313 with a passing grade.
Engr 321	3	Complete Engr 321 with a passing grade.
Engr 322	3	Complete Engr 322 with a passing grade.
Engr 362	3	Complete Engr 362 with a passing grade.
Engr 309 or Csci 251	3	Complete either Engr 309 or Csci 251 with a passing grade.

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REQUIREMENT	HOURS	DESCRIPTION
Ch E 520	3	Complete Ch E 520 with a passing grade.
Chem 334	3	Complete Chem 334 with a passing grade.
Phar 331	3	Complete Phar 331 with a passing grade.
Tech elective or Ch E 330	3	Complete a technical elective or ChE R&D Experience (ChE 330).

