Chemical Engineering (BS)

Degree Requirements

First Year		Credit Hours
Fall		16
EH 101	3 hrs	
MA 125	4 hrs	
EG 101	2 hrs	
CH 131	4 hrs	
BLY 121	3 hrs	
Spring		15
EH 102	3 hrs	
MA 126	4 hrs	
CH 132	4 hrs	
PH 201	4 hrs	

Second Year		Credit Hours
Fall		16
MA 227	4 hrs	
CH 201	4 hrs	
PH 202	4 hrs	
CHE 203	4 hrs	
Spring		16
MA 238	3 hrs	
CH 202	4 hrs	
Tech Elective I	3 hrs	
EG 231	3 hrs	
Gen Ed	3 hrs	

Note:

1. Minimum grade of 'C" is required for all prerequisites to CHE 300-level and 400-level courses.
2. Appropriate software tools will be utilized in almost all CHE courses.

Third Year		Credit Hours
Fall		16
CHE 311	3 hrs	
CHE 321	3 hrs	
CHE 331	3 hrs	
CHE 351	1 hrs	
Gen Ed	3 hrs	
Chemistry Elective	3 hrs	
Spring		16
CHE 322	3 hrs	
CHE 332	3 hrs	
CHE 342	3 hrs	
CHE 352	1 hrs	
CHE 372	3 hrs	
Gen Ed	3 hrs	

Fourth Year		Credit Hours
Fall		17
CHE Elective I	3 hrs	
CHE 421	3 hrs	
CHE 441	2 hrs	
CHE 461	3 hrs	
Gen Ed	3 hrs	
Gen Ed	3 hrs	
Spring		14
CHE Elective II	3 hrs	
CHE 442	2 hrs	
CHE 452	3 hrs	
CHE 462	3 hrs	
Gen Ed	3 hrs	

It is important that students make adequate progress in the Chemical Engineering program. Satisfactory completion of a set of fundamental courses is required before a student is allowed to take advanced courses. Professional Component Standing (PCS) is awarded by the chair of the department when the student completes the College of Engineering PCS requirements and the ChBE departmental PCS requirements.

College of Engineering PCS Courses			
Course Number	Course Title	Credit Hours	Minimum Grade

EH 101	English Composition I	3	C
EH 102	English Composition II	3	C
CH 131	General Chemistry I + Lab	4	C
MA 125	Calculus I	4	C
MA 126	Calculus II	4	C
PH 201	Calculus-Based Physics I + Lab	4	C

Chemical and Biomolecular Engineering PCS Courses			
Course Number	Course Title	Credit Hours	Minimum Grade
CH 132	General Chemistry II + Lab	4	C
CH 201	Organic Chemistry I + Lab	4	C
MA 227	Calculus III	4	C
MA 238	Differential Equations I	3	C
BLY 121	General Biology I	3	C
CHE 203	Material and Energy Balances	4	C

Students who fail to maintain at least a 2.00 GPA overall at the University of South Alabama will lose PCS and may be required to take or repeat appropriate courses as specified by the department chair to correct their deficiencies and may not be permitted to continue in 300- and 400-level engineering courses. CHE 203 may only be taken twice. Failure to achieve a C or better grade in the second attempt of CHE 203 will result in dismissal from the Chemical Engineering program.

Major Milestones

CHEMICAL ENGINEERING SAMPLE 4-YEAR PLAN WITH MILESTONES (2018-2019 USA Bulletin)

Term 1	Course Description	Pre-req	Cr Hrs	Milestone Notes
EH 101*	English Composition I		3	Must complete at least 12 hours with a 2.0 or higher GPA
MA 125	Calculus I	ACT Math 27	4	**Minimum grade of 'C' required in all prerequisite courses
CH 131/131L	General Chemistry I	ACT Math 24	4	
BLY 121	General Biology I	ACT Math 22	3	
EG 101	Freshman Seminar	ACT Math 22	2	
			16	

Term 2	Course Description	Pre-req	Cr Hrs	Milestone Notes
EH 102	English Composition II	EH 101 or test score	3	MA 125
MA 126	Calculus II	MA 125	4	CH 131/131L
CH 132/132L	General Chemistry II	CH 131	4	BLY 121/121L
PH 201/201L	Physics I	MA 125 and EH 101	4	EH 101 or EH 105*
				**Minimum grade of 'C' required for all prerequisite courses
			15	

Term 3	Course Description	Pre-req	Cr Hrs	Milestone Notes
MA 227	Calculus III	MA 126	4	MA 126
CH 201/201L	Organic Chemistry I	CH 132	4	PH 201/201L
CHE 203	Material and Energy Balances	CH 132/132L and MA 126 and EH 101	4	CH 132/132L
PH 202/202L	Physics II	PH 201	4	EH 102
				**Minimum grade of 'C' is required in all prerequisite courses
			16	*CHE 203; only 2 attempts permitted to complete the course with minimum grade of 'C"

Term 4	Course Description	Pre-req	Cr Hrs	Milestone Notes
MA 238	Differential Equations	MA 227	3	CHE 203 *Summer not guaranteed
CH 202/202L	Organic Chemistry II	CH 201/201L	4	MA 238
EG 231	Engineering Economics and Ethics	MA 126	3	CH 201/201L
Technical Elective	See advisor for approved course list		3	MA 227

English Literature			3	**Minimum grade 'C' required in all prerequisite courses
			16	

Term 5	Course Description	Pre-req	Cr Hrs	Milestone Notes
CHE 311	Separations I	CHE 203 and CHE 331 (cc)	3	**Minimum grade of 'C' required in all prerequisite courses
CHE 321	Transport Phenomenal	PH 201, MA 238, and CHE 203	3	CHE courses only available in Fall semester
CHE 331	Thermodynamics I	CH 201/201L, PH 201, CHE 203, MA 238, CHE 351 (cc)	3	
History (US or Western Civ.)			3	
CHE 351	Modeling Lab	CHE 311 (cc) and CHE 331 (cc)	1	
Chemistry Elective	CH 265 OR CH 440		3	
			16	

Term 6	Course Description	Pre-req	Cr Hrs	Milestone Notes
CHE 342	Engineering Communications	EH 102 and CHE 352 (cc)	3	**Minimum grade of 'C' required in all prerequisite courses
CHE 322	Transport Phenomena II	CHE 321	3	CHE courses only available in Spring semester
CHE 332	Thermodynamics II	CHE 331 and CHE 352 (cc)	3	
CHE 372	Reactor Design	CHE 322 and CHE 332	3	
CHE 352	Measurement Lab	CHE 351, CHE 332 (cc), CHE 372 (cc)	1	
Social/ Behavioral Elective			3	

			16	

Term 7	Course Description	Pre-req	Cr Hrs	Milestone Notes
CHE 421	Separations II	CHE 311 and CHE 322	3	Take FE exam
CHE 441	Unit Operations Lab I	CHE 322, CHE 342, CHE 351, CHE 352	2	Apply for graduation
CHE 461	Design I	EG 231, CHE 332, CHE 342, and CHE 372	3	**Minimum grade of 'C' in all prerequisite courses
ChE Elective I	See advisor for approved course list		3	CHE courses only available in Fall semester
Fine Arts Elective			3	
Humanities Elective			3	
			17	

Term 8	Course Description	Pre-req	Cr Hrs	Milestone Notes
CHE 452	Process Controls	CHE 372	3	**Minimum grade of 'C' required in all prerequisite courses
CHE 462	Design II	CHE 461	3	CHE courses only available in Spring semester
CHE 442	Unit Operations Lab II	CHE 311, CHE 421, CHE 441	2	
ChE Elective II	See advisor for approved course list		3	
Social/ Behavioral Elective			3	
			14	
		**TOTAL	126	

All bolded courses meet general education requirements.

Courses listed as Milestones are required to obtain the Professional Component Standing (PCS) and require a minimum grade of 'C'.

Prerequisite courses denoted (cc) may be taken concurrently.

*Students who earn an English ACT score of 27, or a written SAT score of 610, can opt out of EH 101.

**Students not Term 1 - Calculus I ready will exceed the 126 hours required for this degree. Students with ACT Math scores 21 and below will not complete the degree in 4 years. Students beginning in MA 112 must utilize summer before Term 3 by taking MA 125 and CH 132/132L and utilize the summer before Term 5 to complete the degree in 4 years. Students with ACT Math scores 23 and below should begin math courses in the summer before Fall - Year 1.

Two designated writing (W) courses are required with at least one course chosen from offerings in the student's major or minor. Courses carrying this required credit are identified in the University Bulletin by a (W) after the course title.

The Sample 4-year plan is designed as a guide for students preparing for their course selections. This information provides only a suggested schedule. Actual course selections should be made in consultation with an advisor.

Department Information

Department of Chemical and Biomolecular Engineering Staff	(251) 460-6160
Chair	F. Carl Knopf
Professors	Knopf, Leavesley, Sylvester, West
Associate Professors	Glover, Wheeler
Assistant Professors	Rabideau, Walker

Department of Chemical and Biomolecular Engineering website
https://www.southalabama.edu/colleges/engineering/chbe/index.html

Chemical Engineering is a profession in which knowledge of mathematics, chemistry, biology and other natural sciences gained by study, experience, and practice is applied with judgment to develop economical ways of using material and energy for the benefit of mankind. The program required for the degree of Bachelor of Science in Chemical Engineering provides fundamental instruction in mathematics, chemistry, biology, physics, and engineering. This education prepares the graduate to seek employment in petrochemical, pharmaceutical, healthcare, microelectronics, polymers, energy and environmental industries. In addition, the graduate is adequately prepared to pursue graduate school.

Chemical engineering students are required to take the Chemical Engineering discipline specific Fundamentals of Engineering (FE) examination in Alabama or another state prior to graduation. All electives must be approved by the student's advisor. Degree requirements include a minimum of 18 semester hours of approved electives in the Humanities and Social Sciences.

Satisfactory completion of the 126 hour program outlined below leads to a Bachelor of Science in Chemical Engineering. Students must also comply with the College of Engineering Requirements for a Degree, which are covered in the Bulletin under the College of Engineering.

BSChE Program Educational Objectives

The educational objectives of the Department of Chemical & Biomolecular Engineering's undergraduate program are that, within a few years of program completion, graduates will have used the knowledge and skills gained through academic preparation and post-graduation experience so they have:

1. Advanced in the chemical engineering profession, obtained professional licensure, and applied engineering knowledge and problem-solving skills to multi-disciplinary projects.
2. Incorporated economic environmental, social, regulatory, constructability, safety, and sustainability considerations into the practice of chemical engineering.
3. Exhibited effective communication skills, teamwork, leadership, initiative, project management, and professional and ethical behavior.
4. Continued their technical and professional development, which may include graduate level education, continuing education, and participation in professional organizations.

BSChE Student Outcomes

By the time of graduation from the BSChE program, a student will have demonstrated attainment of the following outcomes:

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 judgements, 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 judgement to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The BSChE curriculum is designed to ensure the attainment of the student outcomes.

The Bachelor of Science in Chemical Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org