

# Chemical Engineering, BSCHE

## Bachelor of Science in Chemical Engineering Degree Program Requirements

Complete Core Curriculum Listing at <https://catalog.pvamu.edu/universitycorecurriculum/>

### Core Curriculum 42 Credit Hours

Communication		6
ENGL 1301	Freshman Composition I	
ENGL 2311	Technical and Business Writing	
Mathematics		3
MATH 2413	Calculus with Analytic Geometry I	
Life & Physical Sciences		6
PHYS 2325	University Physics I	
PHYS 2326	University Physics II	
Language, Philosophy & Culture (Select One)		3
Creative Arts (Select One)		3
American History		6
HIST 1301	United States History I	
HIST 1302	United States History II	
Government/Political Science		6
POSC 2305	American Government	
POSC 2306	Texas Government	
Social & Behavioral Sciences		3
CHEG 2308	Eco Anal Technical Application	
Component Area Option One		3
CVEG 2304	Global Development Issues	
Component Area Option Two		3
COMM 1311	Introduction to Speech Communication	
<b>College Requirements <sup>1</sup></b>		
CHEG 1101	Intro Engr, Comp Sci & Tech	1
CHEG 1102	Intro CHEG Lab	1
CHEG 2334	Chemical Engineering Thermodynamics I	3
CHEG 4247	Senior Design and Professionalism -I	2
CHEG 4248	Senior Design and Professionalism - II	2
CHEM 1112	General Chemistry Lab II	1
CHEM 1403	Chemistry for Engineers	4
OR		
CHEM 1303 & CHEM 1304	General Inorganic Chemistry I and General Inorganic Chemistry II	
CVEG 2400	Statics and Dynamics	4
ELEG 2315	Introduction to Electrical Engineering	3
MATH 2320	Differential Equations	3
MATH 2413	Calculus with Analytic Geometry I	1
MATH 2414	Calculus with Analytic Geometry II	4
MATH 3302	Probability and Statistics	3
MATH 4317	Advanced Math for Engineers	3
PHYS 2125	University Physics Lab I	1
PHYS 2126	University Physics Lab II	1
<b>Major Requirements</b>		
CHEG 1202	Introduction to Computations in CHEG	2
CHEG 2301	Materials Science	3

CHEG 2333	Material and Energy Balances	3
CHEG 3101	Chemical Engineering Laboratory I	1
CHEG 3301	Heat, Mass, and Momentum Transport	3
CHEG 3302	Unit Operations	3
CHEG 3304	Chemical Engineering Thermodynamics II	3
CHEG 3305	Equilibrium Stage Separation Processes	3
CHEG 3306	Chemical Reaction Kinetics and Reactor Design	3
CHEG 4101	Chemical Engineering Laboratory II	1
CHEG 4104	Chemical Engineering Laboratory III	1
CHEG 4303	Process Dynamics and Control	3
CHEG 4304	Chemical Process Design and Analysis	3

**Support Area Requirements**

CHEM 2303	General Organic Chemistry I	3
CHEM 2304	General Organic Chemistry II	3
CHEM 3341	Physical Chemistry	3

**Electives** **11**

**Total Hours** **131**

**Chemistry Electives**

3-Hour Advanced Chemistry Elective (select 3 hours from the following): 3

CHEM 3342	Physical Chemistry
CHEM 4302	Forensic Chemistry
CHEM 4303	Biochemistry
CHEM 4305	Instrumental Analysis
CHEM 4306	Inorganic Chemistry

Or Another Course Approved by the Department

2-Hour Chemistry Lab Elective (select from the following): 2

CHEG 2215	Biochemical Engineering Fundamentals Lab
CHEM 2201	Quantitative Analysis
CHEM 2203	Organic Chemistry Lab I
CHEM 2204	Organic Chemistry Lab II
CHEM 2211	Quantitative Analysis Lab
CHEM 3242	Physical Chemistry Lab
CHEM 3243	Physical Chemistry Lab
CHEM 4203	Forensic Chemistry Lab
CHEM 4204	Biochemistry Laboratory
CHEM 4205	Instrumental Analysis Lab

Technical Electives <sup>2</sup> 6

CHEG 3311	Introduction to Energy Systems
CHEG 3312	Petroleum Engineering Fundamentals
CHEG 3315	Introduction to Biotechnology
CHEG 4310	Special Topics in Chemical Engineering
CHEG 4312	Process Safety Engineering Fundamentals
CHEG 4313	Process Modeling and Simulation
CHEG 4315	Bioengineering
CHEG 4318	Design of Process Engineering Systems
CHEG 4321	Nuclear Science Fundamentals
CHEG 4322	Nuclear Forensic Analysis
MCEG 4309	Finite Element Analysis and Design
ELEG 3303	Physical Principles of Solid State Devices

**Total Hours** **11**

**Bioengineering Concentration**<sup>3</sup>

CHEM 4303	Biochemistry	3
CHEM 4204	Biochemistry Laboratory	2
<b>Technical Electives</b>		<b>6</b>
CHEG 3315	Introduction to Biotechnology	
CHEG 4315	Bioengineering	
CHEG 4310	Special Topics in Chemical Engineering	
<b>Total Hours</b>		<b>11</b>

<sup>1</sup> Students must see their advisor to discuss prerequisites to major course requirements.

<sup>2</sup> Technical electives must be 3000 level or higher. All 6 hours must be in engineering. Internship and co-op courses are not suitable as technical electives.

<sup>3</sup> All students in the Bioengineering concentration must complete a project that is Bioengineering related.

**Technical Electives through Five-Year BS/MS Degree Plan Option**

Students may, upon approval to the Five-Year BS/MS Degree Plan Option (see Roy G. Perry College of Engineering Other Programs section), apply up to six semester credit hours of graduate courses toward technical electives requirements.

**Eligibility to Take Upper Division College Courses**

The Roy G. Perry College of Engineering requires an eligibility standard for the students to take upper-division college courses. Students must have completed or be currently enrolled in all lower division (1000 and 2000 level) courses in English, Mathematics, Science, and Engineering to be eligible to enroll in upper-division (3000 or 4000 levels) courses in the Roy G. Perry College of Engineering. Students in the Chemical Engineering Program must complete a prescribed list of courses in the following with a minimum Grade Point Average (GPA) of 2.5 to be eligible to enroll in upper-division (3000 or 4000 levels) courses in the College. Students transferring to the Roy G. Perry College of Engineering with 60 or more semester hours from another institution will be allowed a period of one semester to comply. The following is a list of courses that must be completed prior to enrolling in upper-division courses.

ENGL 2311	Technical and Business Writing	3
CHEM 1112	General Chemistry Lab II	1
CHEM 1403	Chemistry for Engineers	4
MATH 2413	Calculus with Analytic Geometry I	4
MATH 2414	Calculus with Analytic Geometry II	4
PHYS 2125	University Physics Lab I	1
PHYS 2325	University Physics I	3
CHEG 1202	Introduction to Computations in CHEG	2
CHEG 1101	Intro Engr, Comp Sci & Tech	1
CHEG 1102	Intro CHEG Lab	1

**Bachelor of Science in Chemical Engineering Degree Sequence**

Core: <https://catalog.pvamu.edu/universitycorecurriculum/>

**Freshman**

Fall - Semester 1	Hours	Spring - Semester 2	Hours	Summer	Hours
Mathematics Core		4 MATH 2414		4 Government/Political Science Core	3
MATH 2413		CHEG 1202		2 POSC 2305	
CHEG 1101		1 CHEM 1403		4	
CHEG 1102		1 CHEM 1112		1	
COMM 1311		3 Life and Physical Sciences Core		3	
Component Area Option Two Core		3 PHYS 2325			
Communication Core		3 PHYS 2125		1	
ENGL 1301		Communication Core		3	
American History Core		ENGL 2311			

HIST 1301			
<b>Total</b>	<b>15 Total</b>	<b>18 Total</b>	<b>3</b>

**Total Hours: 36**

#### Sophomore

<b>Fall - Semester 1</b>	<b>Hours</b>	<b>Spring - Semester 2</b>	<b>Hours</b>
CHEG 2301		3 CHEM 2304	3
CHEG 2333		3 Component Area Option One Core	3
CHEM 2303		3 CVEG 2304	
Life and Physical Sciences Core		3 CHEG 2334	3
PHYS 2326		ELEG 2315	3
PHYS 2126		1 CVEG 2400	4
MATH 2320		3	
<b>Total</b>		<b>16 Total</b>	<b>16</b>

**Total Hours: 32**

#### Junior

<b>Fall - Semester 1</b>	<b>Hours</b>	<b>Spring - Semester 2</b>	<b>Hours</b>
CHEM 3341		3 MATH 4317	3
CHEG 3301		3 CHEG 3101	1
CHEG 3302		3 CHEG 3305	3
CHEG 3304		3 CHEG 3306	3
Social and Behavioral Science Core		3 Restricted Elective	3
CHEG 2308		Restricted Elective	2
MATH 3302		3	
<b>Total</b>		<b>18 Total</b>	<b>15</b>

**Total Hours: 33**

#### Senior

<b>Fall - Semester 1</b>	<b>Hours</b>	<b>Spring - Semester 2</b>	<b>Hours</b>
CHEG 4101		1 CHEG 4104	1
CHEG 4303		3 Restricted Elective	3
CHEG 4304		3 CHEG 4248	2
CHEG 4247		2 Language, Philosophy, and Culture Core	3
Restricted Elective		3 Creative Arts Core	3
American History Core		3 Government/Political Science Core	3
HIST 1302		POSC 2306	
<b>Total</b>		<b>15 Total</b>	<b>15</b>

**Total Hours: 30**

<b>Name</b>	<b>Unit</b>
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Total Semester Credit Hours: 131

## Marketable Skills

Marketable skills, as defined by the Texas Higher Education Coordinating Board's 60x30TX Plan (<http://www.60x30tx.com/>), include interpersonal, cognitive, and applied skill areas, are valued by employers, and can be either primary or complementary to a major. Marketable skills are acquired by students through education, including curricular, co-curricular, and extracurricular activities.

## BSCHE Chemical Engineering

### Degree Skills

1. Strong interpersonal, oral, and written communication skills and the ability to communicate effectively with project team members
2. Strong analytical and problem-solving skills including the use of spreadsheets and computer simulation software in design
3. Maintain and raise their level of engineering competence and achievement by engaging in lifelong learning

***Concentration Skills***

1. Ability to collaborate and work effectively in a variety of teams, including multi-disciplinary teams
2. Attain leadership roles in professional settings with high levels of competence, ethics and safety consciousness
3. Successfully pursue advanced studies and/or professional careers in new and emerging areas, as well as traditional chemical engineering