



CURRICULUM

Bachelor of Science in Chemical Engineering (BSChE)

Academic Year 2018-2019

Reference CMOs: CMO No. 91 s. 2017, CMO No. 4 s. 2018 and CMO No. 20, s. 2013

Curriculum Description

Chemical Engineering is a profession that involves the conceptualization, development, design, improvement and application of safe, healthy, ethical and economical way of utilizing materials and energy in unit Processes and operations for the benefit of society and the environment through the knowledge of mathematics, chemistry, biology, information technology and other natural, applied and social sciences, gained by study, research and practice.

Program Educational Objectives of Chemical Engineering

The chemical engineering alumni three to five years after graduation shall:

1. Successfully practice as defined in the law governing the scope of Chemical Engineering.
2. Achieve professional growth through the practice of chemical engineering.
3. Adhere to professional, moral and ethical standards in chemical engineering practice.

Student Outcomes

The following skills, knowledge, and behaviors are expected to be attained by students as they progress through the program:

- a. Ability to apply knowledge of mathematics and science to solve engineering problems.
- b. Ability to design and conduct experiments, as well as to analyze and interpret data.
- c. 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, in accordance with standards.
- d. Ability to function on multidisciplinary teams.
- e. Ability to identify, formulate, and solve engineering problems.
- f. Understanding of professional and ethical responsibility.
- g. Ability to communicate effectively.
- h. Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- i. Recognition of the need for, and an ability to engage in life-long learning.
- j. Knowledge of contemporary issues.
- k. Ability to use techniques, skills, and modern engineering tools necessary for engineering practice.
- l. Knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects and in multidisciplinary environments.

CURRICULUM COMPONENTS

Classification/ Field / Course	Number of Hours/Week		Credit Units
	Lec	Lab	
I. TECHNICAL COURSES			
A. Mathematics			
Differential Calculus	3	0	3
Integral Calculus	3	0	3
Differential Equations	3	0	3
Engineering Data Analysis	3	0	3
Sub Total	12	0	12
B. Natural/Physical Sciences			
General Chemistry	3	3	4
Modern Biology	2	3	3
Physics 1	3	3	4
Sub Total	8	9	11
C. Basic Engineering Sciences			
Introduction to Engineering	0	3	1
Engineering Drawing	0	3	1
Computer Fundamentals and Programming	0	3	1
Computer –Aided Drafting	0	3	1
Engineering Economics	3	0	3
Engineering Management	2	0	2
Sub Total	5	12	9
D. Allied Courses			
Physics 2	3	3	4
Analytical Chemistry	4	3	5
Organic Chemistry	4	3	5
Basic Electrical & Electronics Engineering	2	3	3
Material Science and Engineering	3	0	3
Environmental Science and Engineering	3	0	3
Engineering Mechanics	3	0	3
Technopreneurship	3	0	3
Quantitative Methods in Management	3	0	3
Sub Total	28	12	32
E. Professional Courses			
Advanced Engineering Mathematics for ChE	3	0	3
Physical Chemistry for ChE	4	3	5
ChE Calculations	2	3	3
ChE Thermodynamics	2	3	3
Solution Thermodynamics	2	3	3
Momentum Transfer	2	3	3
Heat and Mass Transfer	3	3	4
Separation Processes	2	3	3
Particle Technology	2	3	3
Chemical Engineering Laboratory 1	0	3	1
Chemical Engineering Laboratory 2	0	3	1
Chemical Process Industries	3	0	3
Chemical Process Laboratory	0	3	1
Chemical Reaction Engineering	3	3	4
Process Dynamics and Control	2	3	3
Biochemical Engineering	3	0	3
Industrial Waste Management and Control	3	0	3
Chemical Engineering Design 1	1	3	2
Chemical Engineering Design 2	0	6	2

Laws, Ethics & Process Safety for ChE	2	0	2
Field Trips and Seminars	0	3	1
Computer Applications in ChE	0	3	1
Research Methods	3	0	3
Chemical Engineering Project I	1	3	2
On the Job Training	320 hrs		4
Chemical Engineering Application With Comprehensive Exam	0	6	2
Track Specialization 1	3	0	3
Track Specialization 2	3	0	3
Track Specialization 3	3	0	3
Sub Total	52	60	77
TOTAL TECHNICAL COURSES	105	93	141
II. GENERAL EDUCATION / ELECTIVE & MANDATED COURSES			
A. General Education Courses			
Mathematics for the Modern World	3	0	3
Readings in Philippine History	3	0	3
Understanding the Self	3	0	3
Purposive Communication	3	0	3
Contemporary World	3	0	3
Science, Technology and Society	3	0	3
Art Appreciation	3	0	3
Ethics	3	0	3
Sub Total	24	0	24
B. General Education Electives			
Kontekstwalisadong Komunikasyon sa Filipino	3	0	3
Filipino sa Iba't Ibang Disiplina	3	0	3
ASEAN Literature	3	0	3
Sub Total	9	0	9
C. Mandated Courses			
Life and Works of Rizal	3	0	3
PE 1,2,3 & 4 (2 units each)	8	0	8
NSTP 1 & 2 (3 units each)	6	0	6
Sub Total	17	0	17
TOTAL GE Education/ Electives & Mandated Courses	50	0	50
GRAND TOTAL	155	96	191
SUMMARY			
Courses	Number of Units		
I. Technical Courses			
A. Mathematics	12		
B. Natural/Physical Sciences	11		
C. Basic Engineering Sciences	9		
D. Allied Courses	32		
E. Professional Courses			
1. Core Courses	77		
2. OJT			
II. Non-Technical Courses			
A. General Education Courses	24		
B. Filipino/Literature/Mandated Courses	12		
C. Physical Education	8		
D. NSTP	6		
GRAND TOTAL	191		

PROGRAM OF STUDY

FIRST YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ENGG 401	Introduction to Engineering	0	3	1		
GEEd 101	Understanding the Self	3	0	3		
GEEd 102	Mathematics for the Modern World	3	0	3		
GEEd 105	Readings in Philippine History	3	0	3		
GEEd 106	Purposive Communication	3	0	3		
MATH 401	Differential Calculus	3	0	3		
NSTP 111	National Service Training Program 1	3	0	3		
PE 101	Physical Fitness, Gymnastics and Aerobics	2	0	2		
SCI 401	General Chemistry	3	3	4		
	Total	23	6	25		
FIRST YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
CpE 401	Computer Programming 1	0	3	1		
ENGG 402	Engineering Drawing	0	3	1		
GEEd 104	The Contemporary World	3	0	3		
GEEd 108	Art Appreciation	3	0	3		
GEEd 109	Science, Technology and Society	3	0	3		
MATH 402	Integral Calculus	3	0	3	MATH 401	
NSTP 121	National Service Training Program 2	3	0	3	NSTP 111	
PE 102	Rhythmic Activities	2	0	2	PE 101	
SCI 403	Physics 1	3	3	4	MATH 401	MATH 402
	Total	20	9	23		
FIRST YEAR						
Midterm						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
GEEd 103	Life and Works of Rizal	3	0	3		
GEEd 107	Ethics	3	0	3		
SCI 402	Modern Biology	2	3	3		
	Total	8	3	9		
SECOND YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ChE 401	Analytical Chemistry	4	3	5	SCI 401	
ChE 402	Organic Chemistry	4	3	5	SCI 401	
ChE 403	Chemical Engineering Calculations	2	3	3	SCI 401	
MATH 404	Differential Equations	3	0	3	MATH 402	
MATH 403	Engineering Data Analysis	3	0	3	MATH 402	
SCI 404	Physics 2	3	3	4	SCI 403	
PE 103	Individual and Dual Sports	2	0	2	PE 101	
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	0	3		
	Total	24	12	28		
SECOND YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ChE 404	Physical Chemistry for ChE	4	3	5	MATH 401, ChE 401	
ChE 405	Advanced Engineering Mathematics for ChE	3	0	3	MATH 404	
ChE 406	Chemical Engineering Thermodynamics	2	3	3	MATH 404, ChE 403	
ChE 407	Momentum Transfer	2	3	3	MATH 404, ChE 403	
ENGG 403	Computer-Aided Design	0	3	1	ENGG 402	
ENGG 404	Engineering Economics	3	0	3	MATH 402	
ENGG 413	Environmental Science and Engineering	3	0	3	SCI 401	
PE 104	Team Sports	2	0	2		
Fili 102	Filipino sa Iba't Ibang Disiplina	3	0	3		
	Total	22	12	26		

THIRD YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ChE 408	Solution Thermodynamics	2	3	3	ChE 406	
ChE 409	Heat and Mass Transfer	3	3	4	ChE 407	
ChE 410	Chemical Process Laboratory	0	3	1	ChE 401, ChE 402	
ChE 411	Chemical Engineering Laboratory 1	0	3	1	ChE 407	ChE 409
ChE 412	Computer Applications in Chemical Engineering	0	3	1	ENGG 403, MATH 403	
ChE 413	Process Dynamics and Control	2	3	3	ChE 405	
ENGG 412	Materials Science and Engineering	3	0	3	SCI 401	
ENGG 416	Research Methods	3	0	3	MATH 403	
	Total	13	18	19		
THIRD YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ChE 414	Separation Processes	2	3	3	ChE 409	
ChE 415	Particle Technology	2	3	3	ChE 409	ChE 414
ChE 416	Chemical Engineering Laboratory 2	0	3	1	ChE 411	ChE 414
ENGG 409	Engineering Mechanics	3	0	3	SCI 403	
ChE 417	Chemical Reaction and Engineering	3	3	4	ChE 404, ChE 408	
ChE 418	Industrial Waste Management and Control	3	0	3	ENGG 413	
EE 420	Basic Electrical and Electronics Engineering	2	3	3	SCI 404	
ENGG 406	Engineering Management	2	0	2		
	Total	17	15	22		
THIRD YEAR						
Midterm						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ChE 419	Chemical Process Industries	3	0	3		
ChE 420	Field Trips and Seminars	0	3	1		
Litr 102	ASEAN Literature	3	0	3		
	Total	6	3	7		
FOURTH YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ENGG 417	On-the-Job Training	320		4	Fourth Year Standing	
ChE 421	Chemical Engineering Design 1	1	3	2	ChE 412, ChE 414, ChE 417	
ChE 422	Chemical Engineering Project I	1	3	2	ENGG 416, MATH 403	
ENGG 405	Technopreneurship	3	0	3	Fourth Year Standing	
	Total	5	6	11		
FOURTH YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
IE 426	Quantitative Methods in Mangement	3	0	3	ENGG 404, ENGG 405	
ChE 423	Biochemical Engineering	3	0	3	SCI 402, ChE 417, ChE 402	
ChE 424	Laws, Ethics and Process Safety for Chemical Engineering	2	0	2	GEd 107, ENGG 405	
ChE 425	Chemical Engineering Design 2	0	6	2	ChE 421	
ChE 426	Chemical Engineering Application with Comprehensive Examination	0	6	2	Graduating	
ChE 427	Track Specialization 1	3	0	3		
ChE 428	Track Specialization 2	3	0	3		
ChE 429	Track Specialization 3	3	0	3		
	Total	17	12	21		
GRAND TOTAL UNITS		155	96	191		