

Engineering with Emphasis in Chemical and Materials Engineering Applications AS

Item 1. Program Goals and Objectives

1. The concept of unit operation such as mass transfer, heat transfer, distillation, and evaporation to the design, operation and maintenance of chemical processes.
2. The principles of thermodynamics; process control and instrumentation, computer applications, and materials science to the design, operation, and maintenance of chemical processes.

Item 2. Catalog Description

The Engineering with Emphasis in Chemical and materials Engineering Applications AS degree is designed to incorporate the engineering, science, and communication skills needed to prepare students for multiple entry-level positions in the chemical and materials engineering field. This degree may facilitate transfer to a 4-year institutions.

Item 3. Program Requirements

Requirements	Department Name/#	Title	Units	CSU-GE	IGETC	Sequence
Required Core: 26-27 units	ENGR 1	Introduction to Engineering	2.0			Yr. 1 Fall
	ENGR 1C	Engineering Critical Thinking	3.0	A3	1	Yr. 2 Winter
	ENGR 6	Introduction to Engineering Programming Concepts and Methodologies	4.0			Yr. 1 Spring
	Or					
	ENGR 7	Programming Applications for Engineers	4.0			Yr. 2 Fall
	ENGR 8	Properties of Materials	4.0			Yr. 1 Spring
	CHEM 55	Chemistry for Engineers	5.0			
	OR					
	CHEM 50	General Chemistry I	5.0	B1,3	5	
	OR					Yr. 1 Summer
	CHEM 50H	General Chemistry I – Honors	5.0			
	MATH 160	Precalculus Mathematics	4.0			
OR						
MATH 180	Calculus and Analytic Geometry	4.0				
PHYS 2AG	General Physics	4.0	B1,3	5	Yr. 1 Fall	
OR						
PHYS 4A	Engineering Physics	5.0	B1,3	5		
Required Electives: Choose a minimum of 12 units	CHEM 51	General Chemistry II	5.0	B1,3	5	Yr. 2 Fall
	Or					
	CHEM 51H	General Chemistry II – Honors	5.0	B1,3	5	Yr. 1 Fall
	CHEM 80	Organic Chemistry I	5.0			
	CHEM 81	Organic Chemistry II	5.0			
	ENGR 40	Statistics	3.0			
	ENGR 40T	Applied Statistics	3.0			
	ENGR 50A	Robotics Team Project Development	2.0			
	ENGR 50B	Intermediate Robotics Team Project Development	2.0			
	ENGR 285	Differential Equations and Linear Algebra for Engineers	4.0			
	PHYS 2BG	General Physics	4.0	B1,3	5	
	PHYS 4B	Engineering Physics	5.0	B1,3	5	

Required Major Total	38-39 units
General Education Local Requirement	24
Transferable electives (as needed to reach 60 units)	0
Degree Total:	62 – 63 units

Proposed Sequence:

Year 1 Fall = 15

Year 1 Spring = 18

Year 1 Summer = 3

Year 2 Fall = 9

Year 2 Winter = 3

Year 2 Spring = 12

Total Units: 60

Item 4. Master Planning

This engineering technology program was designed to address a need for engineering technology graduates in Los Angeles County as evidenced by Labor Market Data from the Center of Excellence. The program was also developed from the suggestions of our local industry partners. Additionally, this program provides a new opportunity for students to complete a degree in this discipline.

Cost	Brief Description
<input checked="" type="checkbox"/> New Equipment \$40,000	Universal Testing Machine
<input type="checkbox"/>	
<input checked="" type="checkbox"/> Hardware or Software (include software license renewal) Remodeled Facilities (e.g. lab space, specialized classroom) \$105000	Program and course design require access to the Mountie Makerspace with appropriate support staffing, equipment maintenance, and consumable materials

Item 5. Enrollment and completion Projections

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There is an annual projected demand of over 700 engineering technology jobs.

This program will support enrollment increases. Related engineering course offerings have grown by 250% in the previous 5 years. The development of a new program will meet the needs of a growing market. Students will be able to move between this program and other related offerings.

P. Wolf, Personal Communication, September 25, 2019

	PHSC LHE	PHYS LHE	ENGR LHE	SURV LHE	
Summer 2014	6	18	8.25	0	
Fall 2014	30	134	18.75	4.25	
Winter 2015	0	24	5.25	0	
Spring 2015	30	166	22.5	8.5	
TOTAL LHE	66	342	54.75	12.75	475.5 LHE

	PHSC LHE	PHYS LHE	ENGR LHE	SURV LHE	
Summer 2019	0	36	14	0	
Fall 2019	0	187	79.5	15	
Winter 2020	0	36	22.5	0	
Spring 2020	0	200	94.5	15	
TOTAL LHE	0	459	210.5	30	699.5 LHE

CHANGE in LHE	-66	+117	+155.75	+17.25	+224 LHE
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Item 6. Place of Programs in Curriculum/Similar Programs

This program does not replace any existing programs.

Item 7. Similar Programs at Other Colleges in Service Area

There are no similar programs at other colleges in service area.

pvcatalog.mtsac.edu/programs/programsaz/physics-engineering/engineering-emphasis-chemical-materials-engineering-applications-degree/index.html