

CHEMICAL AND MATERIALS ENGINEERING - CERTIFICATE OF ACHIEVEMENT

Chemical Engineering is the application of chemical and physical principles to design and optimize processes for large-scale production of chemicals, fuels, pharmaceuticals, and food products, as well as for developing semiconductors, refining oil, creating sustainable energy solutions, and manufacturing everyday goods like cleaning products, plastics, and cosmetics. Materials Engineering is the study of designing, testing, and optimizing materials to meet specific performance requirements in a wide range of applications, such as developing lightweight alloys for aerospace, creating durable polymers for medical devices, and improving semiconductor materials for electronics. The Chemical and Materials Engineering Certificate of Achievement provides students with a solid foundation in engineering, science, and mathematics, which is essential for successfully transferring to a four-year university to further their engineering studies. This certificate also opens pathways to internship opportunities, offering students practical experience that enhances their academic journey and career prospects. Students must complete each course with a "C" grade or better to be awarded the certificate.

Program Learning Outcomes

- Acquire, develop, and refine the foundational skills in mathematics, physics, and science necessary to be successful in engineering courses.
- Demonstrate the ability to write computer programs and apply them towards solving engineering problems.
- Effectively apply techniques, skills, and computational tools necessary for chemical and materials engineering.

Course	Title	Units
Engineering Fundamentals 1 Coursework		14-17
PHYS 007A	Calculus-Based General Physics for Scientists and Engineers - I	
ENGR 010	Introduction to Engineering	
	or ENGR 010A Introduction to Engineering	
<i>One of the following Math sequences:</i>		
MATH 066 & MATH 067	Calculus I Late Transcendentals for STEM and Calculus II Late Transcendentals for STEM	
or		
MATH 071 & MATH 072	Calculus I With Analytic Geometry and Calculus II With Analytic Geometry	
Engineering Fundamentals 2 Coursework		13
MATH 073	Multivariable Calculus	
MATH 078	Differential Equations	
PHYS 007B	Calculus-Based General Physics for Scientists and Engineers - II	
<i>Choose one programming course from the following:</i>		1-4
COMSC 041	Programming Concepts and Methodology I	
COMSC 075	Computer Science I: Introduction to Program Structures	

ENGR 030	Programming and Problem-Solving in MATLAB	
ENGR 050	Introduction to Computing	
ENGR 050L	Introduction to Programming Micro-Controllers	
Chemical and Materials Engineering Coursework		16-18
CHEM 001A	General Chemistry	
CHEM 001B	General Chemistry	
ENGR 066A	Introduction to Materials	
ENGR 069	Statics	
	or CHEM 012A Organic Chemistry	
Total Units		44-52