

# ENGINEERING, CERTIFICATE OF ACHIEVEMENT

Engineering, with its many different specialties, is a field of study that draws heavily from the foundational concepts in physics and chemistry and it uses mathematics as a tool to find analytic and numerical solutions to engineering problems. Engineering principles and achievements are omnipresent, dynamic, and ever-changing. The curriculum offered in the Certificate of Achievement in Engineering is not only rooted in the foundational scientific and mathematical concepts, but it also encompasses the long-standing and the evolving principles in engineering and their real-world applications. The Certificate of Achievement in Engineering is designed for those students who are preparing to transfer to a four-year university to complete their Bachelor of Science studies in Mechanical, Aerospace, Manufacturing, Civil, or Electrical Engineering. Furthermore, the completion of this Certificate Program will effectively prepare the student for internship opportunities with the local engineering industries. Students earning the Certificate of Achievement in Engineering may also be eligible to earn the Associates of Science Degree in Engineering by completing the additional required courses in the General Education pattern. To earn the Certificate of Achievement in Engineering, students must complete 33-48 specified units.

Course ID	Title	Units/ Hours
REQUIRED CORE: Complete the following		
CHEM M01A/M01AH	General Chemistry I	5
MATH M25A/M25AH	Calculus with Analytic Geometry I	5
MATH M25B/M25BH	Calculus with Analytic Geometry II	5
PHYS M20A	Mechanics of Solids and Fluids	4
PHYS M20AL	Mechanics of Solids and Fluids Laboratory	1
PHYS M20B	Thermodynamics, Electricity, and Magnetism	4
PHYS M20BL	Thermodynamics, Electricity, and Magnetism Laboratory	1
ELECTIVE COURSES: Select and complete (8 to 23 units):		
ENGR M01	Introduction to Engineering	2
ENGR M04	Engineering Design/CAD	3
ENGR M10	Programming and Problem-Solving in MATLAB	3
ENGR M12	Engineering Materials	3
ENGR M12L	Engineering Materials Laboratory	1
ENGR M16	Engineering Statics and Strength of Materials	4
ENGR M18	Engineering Dynamics	3
ENGR M20	Electrical Engineering Fundamentals	3
ENGR M20L	Electrical Engineering Fundamentals Laboratory	1

## Year 1

Fall Semester		Units/Hours
MATH M25A or MATH M25AH	Calculus with Analytic Geometry I or Honors: Calculus with Analytic Geometry I	5
ENGR M01	Introduction to Engineering	2
<b>Units/Hours</b>		<b>7</b>

## Spring Semester

MATH M25B or MATH M25BH	Calculus with Analytic Geometry II or Honors: Calculus with Analytic Geometry II	5
PHYS M20A	Mechanics of Solids and Fluids	4
PHYS M20AL	Mechanics of Solids and Fluids Laboratory	4
ENGR M04	Engineering Design/CAD	3
<b>Units/Hours</b>		<b>16</b>

## Year 2

### Fall Semester

PHYS M20B	Thermodynamics, Electricity, and Magnetism	4
PHYS M20BL	Thermodynamics, Electricity, and Magnetism Laboratory	1
CHEM M01A or CHEM M01AH	General Chemistry I or Honors: General Chemistry I	5
ENGR M16	Engineering Statics and Strength of Materials	4
and/or		
ENGR M10	Programming and Problem-Solving in MATLAB	3
<b>Units/Hours</b>		<b>17</b>

### Spring Semester

ENGR M12	Engineering Materials	3
ENGR M12L	Engineering Materials Laboratory	1
and/or		
ENGR M18	Engineering Dynamics	3
and/or		
ENGR M20	Electrical Engineering Fundamentals	3
ENGR M20L	Electrical Engineering Fundamentals Laboratory	1
<b>Units/Hours</b>		<b>11</b>
<b>Total Units/Hours</b>		<b>51</b>

Upon successful completion of this program, students will be able to:

- apply engineering concepts and principles, and apply engineering formulas.
- devise logical approaches to solving engineering problems, and assess the reasonableness of the solutions according to engineering.
- explain and apply the engineering design process.
- demonstrate effective oral and written communication skills.
- conduct reliable independent work and develop the skills necessary for effective teamwork.