

ENGINEERING, A.S.

Overview

The Engineering A.S. degree provides a robust academic foundation for students planning to transfer to four-year universities to pursue bachelor's degrees in engineering disciplines such as Mechanical, Civil, Electrical, or Aerospace Engineering. This program focuses on delivering rigorous coursework in advanced mathematics, physical sciences, and core engineering principles, preparing students for the intellectual demands of upper-division engineering coursework.

Students will engage in a curriculum that covers key areas such as engineering problem-solving, analytical reasoning, and the application of scientific principles to real-world engineering challenges. The program integrates coursework in physics and chemistry, reinforcing the scientific methods that underpin engineering. Additionally, students will be introduced to programming languages like MATLAB or C++ to solve computational problems, and engineering drawing technologies (e.g., CAD) to develop technical plans and blueprints.

The emphasis on critical thinking, hands-on lab work, and collaborative projects ensures that students not only master technical content but also develop essential skills in teamwork, communication, and project management—qualities that are highly valued in both academic and professional settings. Optional field experiences and internships offer students the opportunity to apply theoretical knowledge in practical settings and build connections within the engineering industry.

This degree not only provides a strong foundation for students intending to transfer to four-year programs but also equips graduates with the skills necessary for entry-level positions as engineering technicians. Graduates will be well-prepared to pursue further studies or enter the workforce with a solid understanding of engineering concepts and practices.

NOTE: Students are strongly encouraged to develop their individualized plan with a counselor to ensure they meet transfer requirements for their chosen institution, as these requirements can vary significantly. Meeting with a counselor will help tailor your academic plan to align with your specific educational and career goals, ensuring a smooth transition to a four-year university.

AS.ENGR2

Program Map Design Your Future!

Begin by exploring MSJC program maps to find career or transfer (<https://msjc.emsicc.com/?radius=®ion=All%20Regions>) opportunities. Program maps show the recommended course sequence that leads to graduation or transfer. The maps were developed by program experts to give you the skills and knowledge you need to succeed.

- **Starting in Spring?** Choose Fall Semester 1 courses.
- **Are you a part-time student?** Start Fall Semester 1 courses and follow the course sequence.

MSJC Local General Education

Note: This map includes courses required to complete Cal-GETC requirements.

Fall Semester 1		Units
MATH-211	Analytic Geometry and Calculus I ¹	4
ENGR-120	Principles of Engineering Technology	3
ENGL-C1000	Academic Reading and Writing	3
CSCR-100	College Success and Career Readiness	3
POLS-C1000	American Government and Politics	3
Units		16
Spring Semester 1		
MATH-212	Analytic Geometry and Calculus II	4
PHY-201	Mechanics and Wave Motion	4
CHEM-101	General Chemistry I ²	5
ENGR-121 or ENGR-154 or ENGR-756	Introduction to Engineering Design or Computer Aided Drafting I or SolidWorks I	3
Units		16
Summer 1		
ENGL-C1001	Critical Thinking and Writing	3
PHIL-101	Introduction to Philosophy I	3
Units		6
Fall Semester 2		
MATH-213	Analytic Geometry and Calculus III	5
PHY-202	Electricity and Magnetism	4
ENGR-181	Statics	3
PS/ETHS-103 or ANTH/HIST-121 or ETHS-112 or ETHS/SJS-113 or ETHS/LIT-240 or ETHS/LIT-275 or ETHS/HIST-160 or ETHS/LIT-280	Ethnic Politics in America or Indigenous Peoples of California or Introduction to Chicana/o/x Studies or Introduction to Black Studies or American Indian Literature or Latinx/Chicanx Literature or Black History in the American Context or Multiethnic Literature (formerly ENGL-280)	3
Units		15
Spring Semester 2		
ENGR-183	Programming with MATLAB for Engineers and Scientists	4
HIST-111 or HIST-112	U.S. History to 1877 or U.S. History Since 1865	3
ART-100	Art Appreciation	3
ENGR-182	Strength of Materials (formerly Strength and Materials)	3
COMM-C1000	Introduction to Public Speaking	3
Units		16
Total Units		69

¹ Registration in this course may require completion of MATH-105 and/or MATH-110 depending on level of math completed in high school.

² Registration in this course requires completion of CHEM-100 or one year of high school chemistry with a C or better. If you completed one year of high school chemistry, submit your transcripts to officialtranscripts@msjc.edu, and see a Counselor for options and prerequisite clearance.

Requirements

Course	Title	Credits
MSJC Local General Education (https://catalog.msjc.edu/degrees-certificates-curricula/general-education-option-a/)		27
Required Courses		25-26
Major Electives		15-21
Additional Electives (as needed to reach 60 units)		

Course	Title	Credits
Required Courses		
PHY-201	Mechanics and Wave Motion	4
PHY-202	Electricity and Magnetism	4
or PHY-202H	Honors Electricity and Magnetism	
PHY-203	Optics and Modern Physics ¹	4-5
or CHEM-101	General Chemistry I	
or CHEM-101H	Honors General Chemistry I	
MATH-211	Analytic Geometry and Calculus I	4
or MATH-211H	Honors Analytic Geometry and Calculus I	
MATH-212	Analytic Geometry and Calculus II	4
or MATH-212H	Honors Analytic Geometry and Calculus II	
MATH-213	Analytic Geometry and Calculus III	5
or MATH-213H	Honors Analytic Geometry and Calculus III	

List A: CAD Courses

Select one of the following:	3
ENGR-121	Introduction to Engineering Design
ENGR-154	Computer Aided Drafting I
ENGR-756	SolidWorks I

List B: Introduction Courses

Select one of the following:	2-3
ENGR-120	Principles of Engineering Technology
ENGR-180	Introduction to Engineering

List C: Programming Courses

Select one of the following:	3-4
ENGR-183	Programming with MATLAB for Engineers and Scientists
CSIS-123A	C++ Programming - Level 2
CSIS-123B	Java Programming - Level 2
CSIS-126E	Python Programming - Level 2
CSIS-211	Introduction to Data Structures and Algorithms

List D: Analysis Courses

Select two of the following. At least one must be ENGR.	6-8
CHEM-101	General Chemistry I ¹
or CHEM-101H	Honors General Chemistry I
ENGR-181	Statics
ENGR-182	Strength of Materials (formerly Strength and Materials)
ENGR-184	Engineering Circuit Analysis
ENGR-185	Engineering Dynamics
MATH-215	Differential Equations
or MATH-215H	Honors Differential Equations
MATH-218	Linear Algebra

PHY-203	Optics and Modern Physics ¹
Total Units	39-44

¹ Only counts once for requirement or elective.

Career Exploration

Discover information about careers that interest you!

1. Take a **Career Quiz** (<https://msjc.emsicc.com/assessment/>) to learn about yourself and receive career suggestions based on your interests.
2. Search available **in-demand jobs** (<https://msjc.emsicc.com/browse-careers/>) in your career areas of interest and find up-to-date salaries and education requirements.
3. Find the **MSJC Program** (<https://msjc.emsicc.com/browse-programs/>) that connects your interests to a career.

Note: There are no guaranteed positions for students completing these programs. Education and work experience required will vary by employer. The salary and benefits for specific occupations will be dependent on work experience, education, background, and employer.