

Engineering Career Cluster

The Engineering career cluster focuses on planning, designing, testing, building, and maintaining of machines, structures, materials, systems, and processes using empirical evidence and science, technology, and math principles. This career cluster includes occupations ranging from mechanical engineer and drafter to electrical engineer and to mapping technician.

Statewide Program of Study: Mechanical and Aerospace Engineering

The Mechanical and Aerospace Engineering program of study focuses on occupational and educational opportunities associated with the design, development, maintenance, and testing of engines, machines, and structures related to aircraft and spacecraft. Students will design, test, and evaluate projects related to aerodynamics, structural, and mechanical design. This program of study includes applying scientific, mathematical, and empirical evidence to solve problems related to navigation, mechanics, robotics, propulsion, and combustion.

Secondary Courses for High School Credit

- Principles of Applied Engineering
- Introduction to Computer-Aided Design and Drafting
- Engineering Design Process
- Intermediate Computer-Aided Design and Drafting
- Aerospace Design I
- Engineering Design and Presentation
- Practicum in Engineering

Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	• Intern at an aviation or aerospace company • Shadow a mechanical engineer to understand design and testing processes • Complete a project to test and evaluate a new product design for a local company
Expanded Learning Opportunities	• Tour an aerospace facility • Participate in SkillsUSA or TSA

Aligned Industry-Based Certifications

- Autodesk Certified User AutoCAD
- Engineering Technology Foundations



Example Postsecondary Opportunities

Apprenticeships

- Mechanical Engineering Technician Apprenticeship

Associate Degrees

- Mechanical Engineering
- Aeronautics/Aviation/Aerospace Science and Technology, General

Bachelor's Degrees

- Aeronautical/Aerospace Engineering Technology/Technician
- Aeronautics/Aviation/Aerospace Science and Technology, General

Master's, Doctoral, and Professional Degrees

- Electrical and Electronics Engineering
- Aerospace, Aeronautical, and Astronautical/Space Engineering, General

Additional Stackable IBCs/License

- Professional Engineer (PE License)
- Aerospace Engineering Certification

Example Aligned Occupations

Aerospace Engineering and Operations Technologists and Technicians

Median Wage: \$75,660
Annual Openings: 85
10-Year Growth: 21%

Mechanical Engineers

Median Wage: \$103,189
Annual Openings: 1,455
10-Year Growth: 18%

Aerospace Engineers

Median Wage: \$127,870
Annual Openings: 429
10-Year Growth: 18%

Data Source: TexasWages, Texas Workforce Commission. Retrieved 3/8/2024.



For more information visit:

<https://tea.texas.gov/academics/college-career-and-military-prep/career-and-technical-education/eng-mechanical-and-aerospace-engineering-extended.pdf>

Engineering Career Cluster

Statewide Program of Study: Mechanical and Aerospace Engineering

Course Information

Level 1

Course	Prerequisites Corequisites	Career Clusters
Principles of Applied Engineering* 13036200 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	  
Physics for Engineering* 13037150 (1 credit)	Prerequisites: One credit of Algebra I and one credit of chemistry, physics, or Integrated Physics and Chemistry (IPC) Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Introduction to Aerospace and Aviation* N1304672 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	 
Introduction to Computer-Aided Design and Drafting* 13037350 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: Principles of Applied Engineering, Principles of Architecture and Design, or Principles of Manufacturing Recommended Corequisites: None	
Engineering Design Process* 12756001 (1 credit)	Prerequisites: Algebra I Corequisites: None Recommended Prerequisites: Principles of Applied Engineering Recommended Corequisites: None	

Level 2

Course	Prerequisites Corequisites	Career Clusters
Intermediate Computer-Aided Design and Drafting* 13037360 (1 credit)	Prerequisites: Architectural Design I, Introduction to Computer-Aided Design and Drafting, or Engineering Design and Presentation Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Aerospace Design I* 12756040 (1 credit)	Prerequisites: Algebra I Corequisites: None Recommended Prerequisites: None Recommended Corequisites: Geometry	 

* Indicates course is included in more than one program of study in this career cluster.

For additional information on the **Engineering** career cluster, contact cte@tea.texas.gov or visit <https://tea.texas.gov/cte>

Engineering Career Cluster

Statewide Program of Study: Mechanical and Aerospace Engineering

Course Information

Level 3

Course	Prerequisites Corequisites	Career Clusters
Engineering Design and Presentation* 13036500 (1 credit)	Prerequisites: Algebra I and at least one credit in a course from the Engineering career cluster Corequisites: None Recommended Prerequisites: Principles of Applied Engineering Recommended Corequisites: None	
Engineering Mathematics* 13036700 (1 credit)	Prerequisites: Algebra II Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Engineering Science* 13037500 (1 credit)	Prerequisites: Algebra I, one credit in biology, and at least one credit in a course from the Engineering career cluster Corequisites: None Recommended Prerequisites: Geometry, Integrated Physics and Chemistry (IPC), one credit in chemistry, or one credit in physics Recommended Corequisites: None	
Mechanical Design I 12756030 (1 credit)	Prerequisites: Algebra I Corequisites: None Recommended Prerequisites: None Recommended Corequisites: Geometry	
Aerospace Design II* 12756045 (2 credits)	Prerequisites: Geometry and Aerospace Design I Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	

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Statewide Program of Study: Mechanical and Aerospace Engineering

Course Information

Level 4

Course	Prerequisites Corequisites	Career Clusters
Engineering Design and Problem Solving* 13037300 (1 credit)	Prerequisites: Algebra I, Geometry, and at least one credit in a Level 2 or higher course in the Engineering career cluster Corequisites: None Recommended Prerequisites: Engineering Science, chemistry, or physics Recommended Corequisites: Engineering Science, chemistry, or physics	 
Advanced Engineering Design and Presentation* 13036600 (2 credits)	Prerequisites: Algebra I, Geometry, and Engineering Design and Presentation Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Mechanical Design II 12756035 (2 credits)	Prerequisites: Mechanical Design I Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Career and Technical Education Project-Based Capstone* First Time Taken: 12701101 (1 credit)	Prerequisites: None Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	         
Practicum in Engineering* First Time Taken: 12756080 (2 credits) Second Time Taken: 12756090 (2 credits)	Prerequisites: Algebra I and Geometry and a minimum of two credits with at least one course in a Level 2 or higher course from the Engineering career cluster Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	   
Practicum in Engineering + Extended Practicum in Engineering* First Time Taken: 12756085 (3 credits) Second Time Taken: 12756095 (3 credits)	Prerequisites: Algebra I and Geometry and a minimum of two credits with at least one course in a Level 2 or higher course from the Engineering career cluster Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	   

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Statewide Program of Study: Mechanical and Aerospace Engineering

Course Information

Level 4

Course	Prerequisites Corequisites	Career Clusters
Career Preparation for Programs of Study* First Time Taken: 12701121 (2 credits)	Prerequisites: At least one Level 2 or higher CTE course Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Career Preparation for Programs of Study + Extended Career Preparation* First Time Taken: 12701141 (3 credits)	Prerequisites: At least one Level 2 or higher CTE course Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	
Scientific Research and Design* 13037200 (1 credit)	Prerequisites: Biology, and one credit of the following: Physics for Engineering, chemistry, Integrated Physics and Chemistry (IPC), or physics Corequisites: None Recommended Prerequisites: None Recommended Corequisites: None	

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