

# 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.

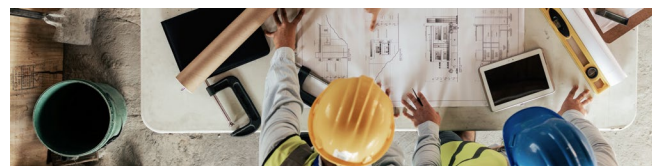
## Statewide Program of Study: Engineering Foundations

The Engineering Foundations program of study focuses on occupational and educational opportunities associated with a wide range of skills applied in the Engineering industry. Students will design, test, and evaluate projects related to engines, machines, and structures. This program of study includes applying scientific, mathematical, and empirical evidence to solve problems through innovation, design, construction, operation, and maintenance of different engineering systems.



### Secondary Courses for High School Credit

<b>Level 1</b>	<ul style="list-style-type: none"> <li>Principles of Applied Engineering</li> <li>Physics for Engineering</li> <li>Introduction to Computer-Aided Design and Drafting</li> <li>Engineering Design Process</li> </ul>
<b>Level 2</b>	<ul style="list-style-type: none"> <li>Intermediate Computer-Aided Design and Drafting</li> <li>Manufacturing Engineering Technology I</li> <li>Robotics I</li> <li>Engineering Project Management</li> <li>Aerospace Design I</li> </ul>
<b>Level 3</b>	<ul style="list-style-type: none"> <li>Engineering Design and Presentation</li> <li>Robotics II</li> <li>Engineering Mathematics</li> <li>Engineering Science</li> <li>Digital Electronics</li> <li>Environmental Engineering</li> <li>Architectural Engineering</li> <li>Computer Integrated Manufacturing (PLTW)</li> <li>Fluid Mechanics</li> <li>Mechanics of Materials</li> <li>Statics</li> <li>Programming for Engineers</li> <li>Aerospace Design II</li> </ul>
<b>Level 4</b>	<ul style="list-style-type: none"> <li>Advanced Engineering Design and Presentation</li> <li>Engineering Design and Problem Solving</li> <li>Career and Technical Education Project-Based Capstone</li> <li>Practicum in Engineering</li> <li>Practicum in Engineering + Extended Practicum in Engineering</li> <li>Career Preparation for Programs of Study</li> <li>Career Preparation for Programs of Study + Extended Career Preparation</li> <li>Scientific Research and Design</li> </ul>



### Example Postsecondary Opportunities

#### Apprenticeships

- Industrial Engineering Technician Apprenticeship

#### Associate Degrees

- Manufacturing Engineering Technology/Technician
- Robotics Technology/Technician

#### Bachelor's Degrees

- Electrical and Electronics Engineering
- Engineering, General

#### Master's, Doctoral, and Professional Degrees

- Electrical and Electronics Engineering
- Engineering, General

#### Additional Stackable IBCs/Licensures

- Professional Engineer (PE License)
- Engineer in Training Certification (EIT)



### Example Aligned Occupations

#### Civil Engineering Technologists and Technicians

Median Wage: \$60,297

Annual Openings: 899

10-Year Growth: 11%

#### Civil Engineers

Median Wage: \$82,483

Annual Openings: 2,223

10-Year Growth: 18%

#### Mechanical Engineers

Median Wage: \$103,189

Annual Openings: 1,455

10-Year Growth: 19%

### Work-Based Learning and Expanded Learning Opportunities

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| <b>Work-Based Learning Activities</b>  | <ul style="list-style-type: none"> <li>Intern at an engineering, robotics, or aerospace company.</li> <li>Visit an engineering firm and shadow multiple types of engineers.</li> </ul> |
| <b>Expanded Learning Opportunities</b> | <ul style="list-style-type: none"> <li>Participate in SkillsUSA or TSA</li> <li>Join a local engineering association and attend meetings.</li> </ul>                                   |



### Aligned Industry-Based Certifications

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| <ul style="list-style-type: none"> <li>Applied Robotics</li> <li>Autodesk Certified Professional in AutoCAD for Design and Drafting</li> <li>Autodesk Certified Professional in Civil 3D for Infrastructure Design</li> <li>Autodesk Certified Professional in Inventor for Mechanical Design</li> <li>Autodesk Certified Professional in Revit for Architectural Design</li> <li>Autodesk Certified Professional in Revit for Electrical Design</li> <li>Autodesk Certified Professional in Revit for Structural Design</li> <li>Autodesk Certified User AutoCAD</li> <li>Autodesk Certified User Fusion 360</li> <li>Autodesk Certified User Inventor</li> <li>Autodesk Certified User Revit</li> <li>C-103 Certified 4.0 Associate III - Robot System Operations</li> <li>Certified Industrial Robotics Programmer (CIRP)</li> <li>Certified Industry 4.0 Technician Level 1</li> <li>Certified Industry 4.0 Technician Level 2</li> <li>Certified Industry 4.0 Technician Level 3</li> <li>Certified Logistics Technician (CLT)</li> <li>Certified Mechanical Technician Level 1</li> <li>Certified Mechanical Technician Level 2</li> <li>Certified Mechanical Technician Level 3</li> <li>Certified Process Control Technician Level 1</li> <li>Certified Process Control Technician Level 2</li> <li>Certified Process Control Technician Level 3</li> <li>Certified Production Technician (CPT) 4.0</li> </ul> | <ul style="list-style-type: none"> <li>Certified Robotics Technician Level 1</li> <li>Certified Robotics Technician Level 2</li> <li>Certified Robotics Technician Level 3</li> <li>Certified SOLIDWORKS Additive Manufacturing Associate (CSWA-AM)</li> <li>Certified SOLIDWORKS Associate (CSWA) - Academic</li> <li>Certified SOLIDWORKS Associate (CSWA) - Electrical</li> <li>Certified SOLIDWORKS CAD Design Associate (CSWA) - Academic</li> <li>Certified SOLIDWORKS CAD Design Professional (CSWP) - Academic</li> <li>Certified SOLIDWORKS Professional (CSWP) - Model Based Design</li> <li>Certified SOLIDWORKS Professional (CSWP) - Simulation</li> <li>Certified SOLIDWORKS Professional (CSWPA) - Drawing Tools</li> <li>Engineering Technology Foundations</li> <li>FANUC Certified Robot Operator with ROBOGUIDE</li> <li>FDM Certification for EDU - Level 1</li> <li>Fundamentals of Robotics</li> <li>Introduction to Aerodynamics</li> <li>Introduction to Electricity</li> <li>Intuit Design for Delight Innovator</li> <li>Lean Six Sigma Green Belt Certification</li> <li>Pre-Engineering/Engineering Technology - Job Ready</li> <li>Robot Operations I</li> <li>Tosa Certification for Autodesk AutoCAD (Advanced or Expert)</li> </ul> |
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Successful completion of the Engineering Foundations program of study will fulfill requirements of the STEM endorsement if the math and science requirements are met or the Business and Industry endorsement.



For more information visit:

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