# 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*

The ***Engineering*** 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 incudes 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

| Grade Level | Courses |
|---|---|
| 9th | • Principles of Applied Engineering |
| 10th | • Engineering Design I |
| 11th | • Engineering Design II |
| 12th | • Practicum in Science, Technology, Engineering, and Mathematics |

## 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)

## Aligned Advanced Academic Courses

| | | | |
|---|---|---|---|
| **AP or IB** | AP Calculus AB<br>AP Computer Science A | AP Physics 1<br>AP Physics 2<br>AP Statistics | IB Physics SL<br>IB Physics HL<br>IB Computer Science SL<br>IB Computer Science HL |
| **Dual Credit** | Dual credit offerings will vary by local education agency. | | |

*Students should be advised to consider these course opportunities to enrich their preparation. AP or IB courses not listed under the Secondary Courses for High School Credit section of this framework document do not count towards concentrator/completer status for this program of study.*

## Work-Based Learning and Expanded Learning Opportunities

| | |
|---|---|
| **Work-Based Learning Activities** | • Intern at an engineering, robotics, or aerospace company.<br>• Visit an engineering firm and shadow multiple types of engineers. |
| **Expanded Learning Opportunities** | • Participate in SkillsUSA or TSA<br>• Join a local engineering association and attend meetings. |

## Aligned Industry-Based Certifications

**IBCs Offered**
- Autodesk Associate (Certified User) AutoCAD
- Autodesk Associate (Certified User) Fusion 360
- Autodesk Associate (Certified User) Inventor for Mechanical Design
- Autodesk Associate (Certified User) Revit Architecture
- Certified SOLIDWORKS Associate (CSWA)– Mechanical Design

## Example Aligned Occupations

### *Civil Engineering Technologists and Technicians*
Median Wage: $61,138
Annual Openings: 765
10-Year Growth: 11%

### *Aerospace Engineers*
Median Wage: $115,694
Annual Openings: 483
10-Year Growth: 18%

### *Mechanical Engineers*
Median Wage: $99,937
Annual Openings: 1,755
10-Year Growth: 19%

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/programs-of-study-additional-resources

*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.*