

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

Level 1	<ul style="list-style-type: none"> Principles of Applied Engineering Introduction to Engineering Design (PLTW) Engineering Essentials (PLTW)
Level 2	<ul style="list-style-type: none"> Robotics I
Level 3	<ul style="list-style-type: none"> Engineering Design and Presentation I Robotics II Engineering Science Aerospace Engineering (PLTW)* Computer Integrated Manufacturing (PLTW)* Engineering Design and Development (PLTW)*
Level 4	<ul style="list-style-type: none"> Engineering Design and Presentation II Engineering Design and Problem Solving Practicum in Science, Technology, Engineering, and Mathematics Scientific Research and Design

*PLTW courses offered at North Garland HS

Aligned Advanced Academic Courses

AP or IB	AP Calculus AB AP Computer Science A	AP Physics 1 AP Physics 2 AP Statistics	IB Physics SL IB Physics HL IB Computer Science SL 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	<ul style="list-style-type: none"> Intern at an engineering, robotics, or aerospace company. Visit an engineering firm and shadow multiple types of engineers.
Expanded Learning Opportunities	<ul style="list-style-type: none"> Participate in SkillsUSA or TSA Join a local engineering association and attend meetings.

Aligned Industry-Based Certifications

- Autodesk Associate (Certified User) Fusion 360
- Autodesk Associate (Certified User) Inventor for Mechanical Design
- Certified SOLIDWORKS Associate (CSWA) – Mechanical Design



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: \$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>

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Statewide Program of Study: Electrical Engineering

The Electrical Engineering program of study focuses on occupational and educational opportunities associated with the design, development, testing, and supervision of electrical equipment and systems. Students will design, test, and evaluate projects related to electrical motors, radar, navigation systems, and communication systems. This program of study includes applying scientific, mathematical, and empirical evidence to solve problems in electrical systems associated with instruments, facilities, components, and equipment.



Secondary Courses for High School Credit

Level 1	<ul style="list-style-type: none"> Principles of Applied Engineering
Level 2	<ul style="list-style-type: none"> AC/DC Electronics
Level 3	<ul style="list-style-type: none"> Digital Electronics
Level 4	<ul style="list-style-type: none"> Engineering Design and Problem Solving

*AC/DC Electronics and Digital Electronic courses offered only at South Garland HS.

Aligned Advanced Academic Courses

AP or IB	AP Calculus AB AP Calculus BC AP Computer Science Principles	AP Physics 1 AP Physics 2 AP Statistics	IB Physics SL IB Physics HL IB Computer Science SL IB Computer Science HL
Dual Credit	Dual credit offerings will vary by local education agency.		

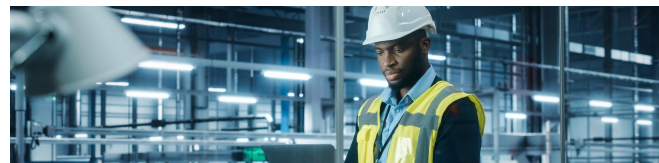
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Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	<ul style="list-style-type: none"> Intern for a construction company and use computer-aided design (CAD) to draw electrical blueprints Shadow an electrical engineering professional
Expanded Learning Opportunities	<ul style="list-style-type: none"> Tour a telecommunications site Participate in SkillsUSA or TSA Join a local engineering association and attend meetings

Aligned Industry-Based Certifications

- Certified SOLIDWORKS Associate (CSWA) – Electrical
- NCCER Electrical Level I
- NCCER Electrical Level II



Example Postsecondary Opportunities

Apprenticeship

- Electrical Technician Apprenticeship

Associate Degrees

- Electrical, Electronic, and Communications Engineering Technology/Technician
- Electromechanical/Electromechanical Engineering Technology/Technician

Bachelor's Degrees

- Electrical and Electronics Engineering
- Systems Engineering

Master's, Doctoral, and Professional Degrees

- Electrical and Electronics Engineering
- Bioengineering and Biomedical Engineering

Additional Stackable IBCs/License

- Professional Electrical Engineer (EE License)
- Electrical Apprenticeship Certificate Level 1 (520)

Example Aligned Occupations

Electrical and Electronic Engineering Technologists and Technicians

Median Wage: \$62,968
Annual Openings: 1,156
10-Year Growth: 14%

Electrical and Electronics Drafters

Median Wage: \$58,987
Annual Openings: 406
10-Year Growth: 16%

Electrical Engineers

Median Wage: \$102,534
Annual Openings: 1,271
10-Year Growth: 21%



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>