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: 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
- Principles o f Applied Engineering(if student did not take Algebra 1)
- Engineering Design Process

Level 2
-
- DC Electronics

Level 3
-
- Engineering Science

Level 4
- Advanced Engineering Design and Presentation

Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	• Intern for a construction company and use computer-aided design (CAD) to draw electrical blueprints • Shadow an electrical engineering professional
Expanded Learning Opportunities	• Tour a telecommunications site • Participate in SkillsUSA or TSA • Join a local engineering association and attend meetings

Aligned Industry-Based Certifications

- Applied Robotics
- Autodesk Certified Professional in AutoCAD for Design and Drafting
- Autodesk Certified Professional in Inventor for Mechanical Design
- Autodesk Certified Professional in Revit for Architectural Design
- Autodesk Certified Professional in Revit for Electrical Design
- Autodesk Certified User AutoCAD
- Autodesk Certified User Fusion 360
- Autodesk Certified User Inventor
- Autodesk Certified User Revit
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 201 Electrical Systems 1
- C-200 Certified Industry 4.0 Automation Systems Specialist I - 208 Programmable Controller Troubleshooting 1
- Certified Industrial Robotics Programmer (CIRP)
- Certified Industry 4.0 Technician Level 1
- Certified Industry 4.0 Technician Level 2
- Certified Industry 4.0 Technician Level 3
- Certified Mechanical Technician Level 1
- Certified Mechanical Technician Level 2
- Certified Mechanical Technician Level 3
- Certified Process Control Technician Level 1
- Certified Process Control Technician Level 2
- Certified Process Control Technician Level 3
- Certified Robotics Technician Level 1
- Certified Robotics Technician Level 2
- Certified Robotics Technician Level 3
- Certified SOLIDWORKS Additive Manufacturing Associate (CSWA-AM)
- Certified SOLIDWORKS Associate (CSWA) - Academic
- Certified SOLIDWORKS Associate (CSWA) - Electrical
- Certified SOLIDWORKS CAD Design Associate (CSWA) - Academic
- Certified SOLIDWORKS CAD Design Professional (CSWP) - Academic
- Certified SOLIDWORKS Professional (CSWP) - Model Based Design
- Certified SOLIDWORKS Professional (CSWP) - Simulation
- Certified SOLIDWORKS Professional (CSWPA) - Drawing Tools
- CNC 5-Axis Mill Setup and Operations
- Core
- Electrical Level I
- Electrical Level II
- Engineering Technology Foundations
- FANUC Certified Robot Operator with ROBOGUIDE
- FDM Certification for EDU - Level 1
- Fundamentals of Electricity - AC/DC
- Fundamentals of PLCs - Allen-Bradley/Siemens
- Fundamentals of Robotics
- I4.0 Smart System Operation
- Introduction to Electronics
- Intuit Design for Delight Innovator
- Lean Six Sigma Green Belt Certification
- Pre-Engineering/Engineering Technology - Job Ready
- Robot Operations I
- TOSA Certification for Autodesk AutoCAD (Advanced or Expert)

Successful completion of the Electrical Engineering program of study will fulfill requirements of the STEM endorsement if the math and science requirements are met or Business and Industry endorsement .

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: $64,216
Annual Openings: 825
10-Year Growth: 14%

Electrical and Electronics Drafters
Median Wage: $64,315
Annual Openings: 316
10-Year Growth: 16%

Electrical Engineers
Median Wage: $102,706
Annual Openings: 1,097
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/eng-electrical-engineering-extended.pdf

Electrical Engineering

Engineering Career Cluster

Statewide Program of Study: Electrical 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 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	
Robotics I* 13037000 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisite:** Principles of Applied Engineering **Recommended Corequisites:** None	

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** 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

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Engineering Career Cluster

Statewide Program of Study: Electrical Engineering

Course Information

Level 2

Course	Prerequisites | Corequisites	Career Clusters
Programmable Logic Controller I N1303689 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Principles of Applied Engineering or Principles of Manufacturing **Recommended Corequisites:** None	
Manufacturing Engineering Technology I* 13032900 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I **Recommended Corequisites:** None	
AC/DC Electronics 13036800 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Principles of Applied Engineering **Recommended Corequisites:** None	

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	
Robotics II* 13037050 (1 credit)	**Prerequisites:** Robotics I **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Programmable Logic Controller II N1303690 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Principles of Applied Engineering or Principles of Manufacturing and Programmable Logic Controllers (PLC) I **Recommended Corequisites:** None	
Engineering Mathematics* 13036700 (1 credit)	**Prerequisites:** Algebra II **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

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Engineering Career Cluster

Statewide Program of Study: Electrical Engineering

Course Information

Level 3

Course	Prerequisites | Corequisites	Career Clusters
Solid State Electronics 13036900 (1 credit)	**Prerequisites:** AC/DC Electronics **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	
Digital Electronics* 13037600 (1 credit)	**Prerequisites:** Algebra I and Geometry **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Computer Integrated Manufacturing (PLTW)* N1303748 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Introduction to Engineering Design **Recommended Corequisites:** College preparatory mathematics and science courses	

Level 4

Course	Prerequisites | Corequisites	Career Clusters
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	
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 physis	

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Engineering Career Cluster

Statewide Program of Study: Electrical Engineering

Level 4

Course Information

Course	Prerequisites | Corequisites	Career Clusters
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	
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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Electrical Engineering

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