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.

Regional Program of Study: Geospatial Engineering and Land Surveying Approved in ESC Regions 2, 4, 10, 11, 13, and 20

The list of approved ESC regions is updated every school year. Be sure to check the CTE regional program of study website for updates.

The Geospatial Engineering and Land Surveying regional program of study focuses on occupational and educational opportunities associated with surveying, automated computer aided drafting, geographical information systems and raster-based geographic information systems. This program of study includes the exploration of remote sensing, geoscience, and mapping.

Secondary Courses for High School Credit

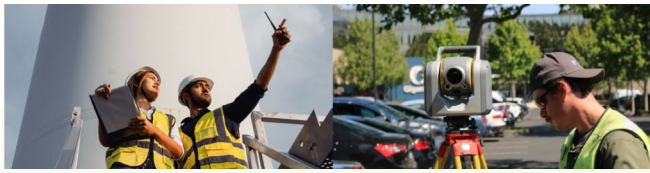
Level 1	• Principles of Applied Engineering • Principles of Architecture
Level 2	• Geographic Information Systems (GIS) • Raster Based Geographic Information Systems
Level 3	
Level 4	• Career and Technical Education Project-Based Capstone • Practicum in Engineering • Practicum in Engineering + Extended Practicum in Engineering • Career Preparation for Programs of Study • Career Preparation for Programs of Study + Extended Career Preparation • Scientific Research and Design

Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	• Intern as a surveyor to learn how to prepare plots, maps, and reports • Shadow a geographic information system (GIS) analyst on a field project • Execute a mapping project for a local company or community organization
Expanded Learning Opportunities	• Participate in SkillsUSA or TSA • Participate in ArcGIS Online School Competition

Aligned Industry-Based Certifications

- Engineering Technology Foundations
- LEED Green Associate
- Pre-Engineering/Engineering Technology - Job Ready



Example Postsecondary Opportunities

Apprenticeships
- Surveyor Instrument Apprentice

Associate Degrees
- Geographic Information Science and Cartography
- Surveying Technology/Surveying

Bachelor's Degrees
- Geographic Information Science and Cartography
- Surveying Engineering

Master's, Doctoral, and Professional Degrees
- Geology/Earth Science, General
- Surveying Engineering

Additional Stackable IBCs/License
- Registered Professional Land Surveyor RPLS
- GISCI-GISP Certified GIS Professional

Example Aligned Occupations

Surveying and Mapping Technicians
Median Wage: $48,203
Annual Openings: 1,325
10-Year Growth: 18%

Surveyors
Median Wage: $60,299
Annual Openings: 462
10-Year Growth: 13%

Cartographers and Photogrammetrists
Median Wage: $68,350
Annual Openings: 158
10-Year Growth: 16%

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-geospatial-engineering-and-land-surveying-extended.pdf

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

Texas Education Agency

Geospatial Engineering and Land Surveying

Engineering Career Cluster

Regional Program of Study: Geospatial Engineering and Land Surveying

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	
Principles of Architecture 13004210 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

Level 2

Course	Prerequisites | Corequisites	Career Clusters
Geographic Information Systems (GIS)* 13027545 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Principles of Arts, Audio/Video Technology, and Communications, Principles of Information Technology, Physics for Engineers, or Principles of Applied Engineering **Recommended Corequisites**: None	
Raster-Based Geographic Information Systems 13027550 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Geographic Information Systems **Recommended Corequisites:** None	

Level 3

Course	Prerequisites | Corequisites	Career Clusters

Level 4

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	

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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

Engineering Career Cluster

Regional Program of Study: Geospatial Engineering and Land Surveying

Level 4

Course Information

Course	Prerequisites | Corequisites	Career Clusters
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	

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

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