

# CIVIL ENGINEERING & ENERGY TECHNOLOGY



Students interested in engineering, biomechanics, aeronautics, and other applied math and science arenas will discover this program provides an exciting portal into these industries. Through activities-based, project-based, and problem-based learning, this program creates an environment for applying engineering concepts to real problems. No matter where students pursue their collegiate training in engineering, this program provides an excellent foundation for addressing and implementing solutions to existing problems with contemporary technology and applied logic. If college level work is attained, student may earn up to 13 LCC credits.

**Program Location:**  
*LCC West Campus*

**Session Offered:** *AM*

**Average Lecture Days/Week:** *2-3 days*

**Average Lab Days/Week:** *2-3 days*

**Homework:** *Weekly*

**Required reading:**  
*College level textbook*

**LCC Credits Available:** *13*  
*(If college level work is attained)*

## Student learning outcomes include but are not limited to:

- Describe and create a basic road profile to demonstrate broad applications and interpretations of civil technology
- Draw three views from existing engineering data by calculating dimensions, square footage, profile and component specifications, and material quantities, using a calculator or computer
- Compute surveying data using basic math skills, including multiplication and division
- Plot traverses and contour maps using one or more gridding methods depending on the type of data and map being generated
- Create three-dimensional drawings and relate them to highway plans
- Subdivide and plot property descriptions and compute distances and bearings between parcels
- Plot profiles, cross-sections, ditches and slope stake lines
- Collect cross-section data in the field and then plot centerline profile
- Plot a proposed plan grade profile and cross-sections from the field data
- Plot proposed typical sections and slope stakes
- Compute end areas and volumes for earthwork quantities
- Plot bridge stakeout diagrams and the three views for a substructure unit
- Identify and evaluate basic sources of alternative energies
- Identify key operational components of geothermal, wind, solar, biomass and fuel cell technologies
- Identify career paths in energy technology
- Identify the relationships between energy, infrastructure, architecture, land planning and building construction
- Create 2-D drawings using basic graphic tools and procedures

## HIGH SCHOOL/COLLEGE CREDIT

The primary focus of the Eaton Intermediate School District Career Preparation Center is to enhance a student's high school curriculum by providing an opportunity to learn a technical trade and/or to obtain a head start on a post-secondary education.

All students completing an Eaton Intermediate School District's Career Center program at Lansing Community College **have the opportunity** to earn either direct or articulated college credit while completing their high school program if specific criteria are met.

LCC credit is awarded to a student who: a) completes the high school career and technical education course with a minimum of a "C" average; b) meets the performance objectives for a specific Lansing Community College course; and, c) passes the college course final examinations, if one is required. These credits are shown as numerical grades on the student's LCC transcript. Transcripts may be requested through Lansing Community College Enrollment Services Department by August following course completion.

The courses listed below show the possible LCC college credits that may be available to high school students taking an EISD Career Preparation Program.

### CIVIL ENGINEERING & ENERGY TECHNOLOGY

#### **CIVL 100      Introduction to Civil Technology      3 LCC Credits**

Students explore programs of study, the nature of work performed by technicians, and opportunities available in civil technology fields. Topics include site layout, surveying, types of materials, computer methods and tools used to address current issues in civil technology. Field trips to private and public (MDOT) office are conducted.

#### **CIVL 101      Civil Drafting      3 LCC Credits**

This course emphasizes plotting land surveying descriptions, traverses, contours, profiles, cross-sections, templates, and the three views required in highway work. Students will learn how to read basic highway plans and make sketches from field notes.

#### **AEET 102      Principles of Alternative/Renewable Energies      4 LCC Credits**

This course will cover basic principles and history of alternative energy sources. Industry and government status of geothermal, wind, solar, biomass, fuel cells and other energy sources will be highlighted. Alternative and traditional energies will be defined and compared in terms of today's use. The evolving energy career areas will be discussed.

#### **GRET 203      Beginning MicroStation      3 LCC Credits**

This entry-level, computer-aided design and drafting course uses MicroStation software on an Intergraph workstation or PC. Students will create 2-D drawings using basic graphic tools and procedures.