

# Pathway Courses

## Introductory Core Courses

### Biological Links to Energy & Environment

This hands-on course integrates biology and the basics of energy science. This integration is important because biological processes are dependent on energy flow and environment factors. The natural environment is able to direct energy in a one-way flow so that various forms of energy are used throughout the dynamics of an ecosystem. By making connections of energy flow in a single cell or ecosystem to energy use by society, students gain a better understanding of the need to use energy more sustainability. Specific attention is paid to energy acquisition and use in living organisms, complex ecosystems and the changing environment. This includes a fundamental look at cell type, function and structure. Students compare energy sources for plants and animal cells with renewable and non-renewable energy use by humans. Specific aspects to CTE include an understanding of energy types, energy calculations, and how energy is derived from a variety of natural and man-made sources.

### Chemistry & Environmental Engineering: Water

This course serves to introduce the principles of chemistry and environmental engineering through an understanding of the behavior of water and its interactions with the environment. Students will use a systems-based approach to understand that all environmental systems consist of matter and will apply this knowledge to solving current and future global water issues. This course seeks to explain the basic chemistry required to understand crucial environmental interactions in order to encourage students to take a critical approach to solving complex water-related issues on a local and global scale. Upon completion of the course, students will be able to integrate the complex questions surrounding the future use and consumption of water and develop possible solutions to this global crisis.

# Pathway Courses

## Elective Courses

### Introduction to Engineering Design (PLTW)

Introduction to Engineering Design (IED) is a foundation course in the PLTW Engineering Program. In IED students are introduced to the engineering profession and a common approach to the solution of engineering problems, an engineering design process. Utilizing activity-project-problem-based (APB) teaching and learning pedagogy, students will progress from completing structured activities to solving open-ended projects and problems that require them to develop planning, documentation, communication, and other professional skills. Through both individual and collaborative activities, projects, and problems, students will solve problems as they practice engineering design and development protocols. Students will develop skill in technical representation and documentation of design solutions according to accepted technical standards and they will use current 3D design and modeling software to represent and communicate solutions.

### Principles of Engineering (PLTW)

Principles of Engineering (POE) is a foundation course of the engineering pathway. It exposes students to major concepts that they will encounter in a post-secondary engineering course of study. Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of materials and structures, automation, and kinematics. The course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology. Students have the opportunity to develop skills and understanding of course concepts through activity-project-problem-based (APB) learning. APB learning challenges students to hone their interpersonal skills, creative abilities, and problem solving skills. Students will also learn how to document their work and communicate their solutions to their peers and members of the professional community.

# Pathway Opportunities

## Certification Options:

- OSHA 10-Hour General Industry
- AutoCAD
- Autodesk
- Solidworks

## Technology Skills:

- VEX Robotics Platform
- Logger Pro
- ROBOTC
- Microsoft Office
- Autodesk Inventor
- MD Solids

## Professional Skills:

- Team Collaboration
- Project Management
- Problem-Solving Skills
- Communication Skills
- Presentation Skills
- Technical Writing

# Career Opportunities

- Architect
- CAD Drafter
- Chemical Engineer
- Civil Engineer
- Electrical Drafter
- Environmental Engineer
- Environmental Engineering Technician
- Environmental Scientist & Specialist
- Hydrologist
- Mechanical Drafter
- Mechanical Engineer
- Natural Science Manager
- Project Engineer: Design
- Project Engineer: Manufacturing

## HOW TO APPLY:

Request application information from your high school counselor.

For more information about the Environmental Engineering Pathway, please contact:

### CTE Counselor

Tracy Brandon  
559-327-3000

### CTE Instructors

Sascha Ludwig  
Kendia Herrington  
Daniel Samarin

### CTE Learning Director

Jennifer Carter  
559-327-3000

## Environmental Engineering Pathway

Buchanan High School



Clovis Unified School District

2017-2018