

COURSE DESCRIPTION

This course is a practical, project based, hands-on course. Experiences and projects include design and fabrication of a CO₂ powered crash test vehicle, electronics prototyping (i.e. strobe light, amplifier, programmable LED cube), development of a printed circuit board (PCB), soldering, reading and creating technical drawings, welding fundamentals, use of fabrication equipment (metal lathe, milling machine, sheet metal machines, laser cutter/engraver, 3D printing) to create an electronics enclosure, precision hammer, and sheet metal tool tray. These experiences will help students develop specific technical, critical thinking, and problem solving skills to be prepared for future career training and all higher education disciplines.

ACADEMIC PLANNING

This course satisfies one elective credit required for graduation.

PREREQUISITE: EPT I, IED, POE, CIM, STEM LAB, OR TEACHER APPROVAL

FREQUENCY: SEMESTER/DAILY

STANDARDS

- PA Science and Technology
 - 3.2.10 A
 - 3.6.10 C
 - 3.7.10 A,B
 - 3.8.10 C
- PA Career Education and Work
 - 13.1.11.A
- PA Health, Safety & Physical Education
 - 10.3. A Safety and Injury Prevention

UNITS

- Safety
- Precision Measurement
- Sketching/Scale/Design
- Energy Conversion
- Electricity / Electronics
- Basic Fabrication Techniques
- Careers

OBJECTIVES

- Demonstrate an understanding of safety procedures; understand important safety features of the lab, tools, machines, and demonstrate a safety first attitude at all times.
- Understand and demonstrate proper care of power tools and machinery.
- Understand and apply the English system of linear measurement accurately
- Identify and properly use all basic and precision measurement instruments and layout tools.
- Become familiar with Energy, Power, Transportation (EPT) technology, related terms, and applications.
- Develop an appreciation of design principles through sketching, drawing, and how it applies to product development and solving problems.
- Understand how energy is transferred during a crash.
- Design, build, predict, test, and analyze how a crash occurs within a given transportation problem
- Use proper techniques to solder and build circuit boards.

622 ENERGY, POWER, & TRANSPORTATION II

- Apply knowledge of circuit schematics and components to design and create a printed circuit board
- Learn the uses and applications of capacitors, resistors, batteries, switches, potentiometers, and other electronic components to modify and predict the effects on circuits.
- Utilize precision measurement, specialized processes, and knowledge of machines to fabricate products of value and products that solve specific problems.
- Develop a high degree of quality in workmanship through project completion.

KEY RESOURCES

- Teacher developed activities and projects

ASSESSMENTS & GRADING

Assessments / class work / projects / homework = 75%

Class Expectations / Responsibilities = 10%

Weekly Evidence Portfolio = 10%

Mid-term / Final / Digital Portfolio = 5%

ATTENDANCE POLICY

Twin Valley School District's attendance policy can be found in the [TVHS Student Handbook](#).

ELECTRONIC DEVICE POLICY

Twin Valley School District's Electronic Device Policy can be found in [School Board Policy 237](#). Additional information can be found in the [TVHS Student Handbook](#).

ACCOMMODATIONS STATEMENT

The Twin Valley School District has a longstanding commitment to the inclusion of students requiring specially-designed instruction within the general education environment to the extent appropriate for the individual child. Twin Valley School District implements a co-teaching model at levels in which general and special education teachers plan and provide instruction within a general education class so that instruction is differentiated to meet the educational needs of all students. These co-taught classes increase learning opportunities and success within the least restrictive environment.

ACADEMIC POLICIES & PROCEDURES

Twin Valley School District values academic integrity. The following information regarding cheating/plagiarism can be found in the [TVHS Student Handbook](#): "Students involved in cheating, plagiarism, and/or unauthorized copying of schoolwork or other educational material will receive no credit for the particular test or assignment, or other actions at the discretion of the teacher. More severe or involved offenses may result in disciplinary actions by the school administration." Additional High School Academic information can be found on their [Program of Studies Website](#).