

623 Electronics and Metal Technology III

COURSE DESCRIPTION

This course is an advanced hands-on learning experience that includes electrical alternating current (AC) wiring (residential, the power grid, design and construction of an Edison style lamp), electronics (LED task light), metal fabrication using CAD/CAM, CNC machining, CNC plasma cutting. All projects include design and problem solving elements that will utilize the safe operation of the tools and equipment.

ACADEMIC PLANNING

This course satisfies one elective credit required for graduation.

PREREQUISITE: Electronics and Metal II OR TEACHER APPROVAL

FREQUENCY: SEMESTER/DAILY

STANDARDS

- PA Science and Technology
 - 3.2.10 D
 - 3.4.10 C
 - 3.6.10 C
 - 3.7.12 A,B
 - 3.8.10 B
- 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
- AC Power / Electricity
- Introductory Robotics
- Advanced 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 Electronics and Metal 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 the AC current, the power grid, common units of measure associated with AC power, energy usage, and billing (KWH).
- Understand, create/wire, take measurements, and troubleshoot common AC residential electrical circuits utilizing NEC code specifications.

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- Understand and apply knowledge of basic systems to build an electro-mechanical robot to solve a specific problem.
- Utilize Computer Numerical Control (CNC), 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](#).