



WELD 1600

Division: Career and Technical Education

Department: Industrial Technology

Course: WELD 1600

Title: Welding Electrical and Electronics I

Catalog Description:

This course covers the principles and laws that govern electrical circuits, including Ohm's and Kirchhoff's Laws. Student will also gain understanding of the use of meters, wiring diagrams, wiring repair, transformers conductors, semiconductors, PN junctions, diodes, transistors, multiplexing, computers, and sensors.

General Education Requirements: N/A

Semesters Offered: TBA

Credit/Time Requirement: Credit: 3; Lecture: 3; Lab: 2

Clock/Hour Requirements: 75

Offered for Non-Credit: Yes

Prerequisites: N/A

Corequisites: N/A

Justification:

This course is required for graduation with an AAS degree in Welding Technology. Course content meets American Welding Society entry level requirements. It is approved by the advisory committee for Welding Technology.

Student Learning Outcomes:

Upon successful completion of this course, students will be able to:

- understand and predict voltage, current and resistance in series, and parallel circuits
- use and make mathematical calculations using Ohm's and Kirchhoff Watt's Law
- understand operation and use of DC and AC electricity
- use wiring diagrams to troubleshoot and identify problems in electrical components
- use a digital volt Ohm meter (D.V.O.M.) to properly test various electrical components.

Content:

Upon completion of this course, students will understand and be able to explain:

- the use of Ohm's and Kirchoff's Laws to analyze electrical circuits
- safe practices when working on or around electrical components
- principles of DC and AC electricity
- principles of series circuits
- principles of parallel circuits
- principles of series-parallel circuits
- measuring electrical circuits with a digital multi-meter
- how to build electrical and electronic test equipment
- theory of magnetism
- theory of step up and step down transformers
- theory and principles of relay, solenoids, various diodes, transistors, and integrated circuits
- proper usage of circuit protection devices; such as fuses, circuit breakers, and fusible links
- how to read and understand electrical wiring diagrams
- how to properly identify and repair wiring, wiring harnesses, connectors, and terminals
- how to identify electrical symbols
- component locators
- semiconductor operation
- pulse generators and voltage regulation
- use of a digital logic probe to measure DC voltage levels and digital signal pulses

General Education Outcomes:

Applied Education Outcomes:

3) Students will demonstrate safe practices and awareness of potential hazards in their field of expertise.

Students will study, test on, and practice a safe work environment in the lab area.

Key Performance Indicators:

Student Learning Outcomes will be assessed by two or more of the following Key Performance Indicators:

- chapter assignments
- final final test
- shop cleanup
- transferring to other post secondary institutions
- performance in subsequent courses.

Representative Text and/or Supplies:

- Barry Hollembeak, *Automotive Electricity and Electronics*, current edition, Thomson/Delmar Learning.

Signatures:

I hereby submit this course syllabus:

Alan Palmer, M. Ed., Associate Professor

I hereby find this course consistent with the goals and resources of the Industrial Technology Department:

Alan Hart, AAS, Instructor, Chair

I hereby find this course consistent with the goals and resources of the Career and Technical Education Division:

Michael P. Medley, MBA, Assistant Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)