WELD 2320

Division: Career and Technical Education
Department: Industrial Technology
Course: WELD 2320
Title: Metallurgy
Catalog Description:

Metallurgy is the science that explains the properties, behavior, and internal structure of metals. The course emphasizes welding carbon and alloy steels used with metals, such as cast iron. Discussions and demonstrations are given on various methods of heat treatment and metal properties.

General Education Requirements: N/A
Semesters Offered: TBA
Credit/Time Requirement: Credit: 4; Lecture: 4; Lab: 0
Clock/Hour Requirements: 60
Offered for Non-Credit: Yes
Prerequisites: N/A

Corequisites: N/A

Justification:

The program advisory committee has approved this course.

Student Learning Outcomes:

Upon successful completion, students will be able to:

- understand the composition of steel
- understand the properties of steel
- know metallurgical and chemical terms
- explain isothermal transformation diagrams.

Content:

Course objectives will be accomplished by providing students with learning experiences in the following subject areas:

- practical applications of metallurgy
- metallurgical and chemical terms

- composition of steel
- manufacture of iron and steel
- hardness
- properties of steel
- crystal structure.

General Education Outcomes:

1) Read effectively, constructively, and critically.

Students will read the required text, as well as other assigned readings. Students must be able to answer questions on exams and synthesize information into laboratory experiences.

7) Apply scientific reasoning to a variety of contexts.

Students will understand the structural changes that take place in ferrous and non-ferrous materials during the welding process.

Applied Education Outcomes:

1) Students will acquire entry-level skills specific to and appropriate for employment in their chosen field of study.

Students will correctly learn metaluracal processes, e.g., heat treating, quenching, annealing, normalizing, and tempering on a variety of materials.

Key Performance Indicators:

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

- assignments
- tests
- quizzes
- competency in subsequent courses and on the job
- visually inspect welds
- non-destructive testing procedures on weldments in future projects.

Representative Text and/or Supplies:

- Daniel A. Brandt, *Metallurgy Fundamentals*, current edition, Goodheart-Willcox.

Optimum Class Size: 10
Maximum Class Size: 20

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)