ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: Workforce Development (WFD)

COURSE: WED 1209 Welding Metallurgy

Effective Date: Spring 2025

Submitted Date: Aug-24

Credit Hours: 3 **IAI Number (if applicable): N/A**

Complete all that apply or mark "None" where appropriate:

Prerequisite(s): None.

Enrollment by assessment or other measure? ☐Yes ☒No

If yes, please describe:

Corequisite(s): None.

Pre- or Corequisite(s): None.

Consent of Instructor: ☐Yes ☒No

Delivery Method:	☒**Lecture**	**2 Contact Hours** (1 contact = 1 credit hour)
	☐**Seminar**	**0 Contact Hours** (1 contact = 1 credit hour)
	☒**Lab**	**2 Contact Hours** (2-3 contact = 1 credit hour)
	☐**Clinical**	**0 Contact Hours** (3 contact = 1 credit hour)
	☐**Practicum**	**0 Contact Hours** (2-4 contact = 1 credit hour)
	☐**Internship**	**0 Contact Hours** (5-10 contact = 1 credit hour)

Offered: ☐**Fall** ☒**Spring** ☐**Summer**

CATALOG DESCRIPTION:

Basic introduction to ferrous and nonferrous material and alloys, and their molecular activity during processing from raw material to finished product. The composition and changes of the metal are analyzed under laboratory testing to heat treatment, destructive and nondestructive testing, and various fabrication processes.

ACCREDITATION STATEMENTS AND COURSE NOTES:
None.

COURSE TOPICS AND CONTENT REQUIREMENTS:

I. Metallurgy Basics
II. Physical and Mechanical Properties of Metals
III. Material Coding Systems
IV. Heat Treating
V. Non-Destructive Testing
VI. Fabrication Metallurgy
VII. Hardness Testing
VIII. Analyzing Metal and Process Failures

INSTRUCTIONAL METHODS:

- Lecture
- Demonstrations
- Lab
- Observations

EVALUATION OF STUDENT ACHIEVEMENT:

- Quizzes
- Tests
- Comprehensive final
- Labs
- Demonstrations/Observations

INSTRUCTIONAL MATERIALS:
Textbooks
Brandt, D., & Warner, J. C., (2021). Metallurgy Fundamentals (6th Edition), ISBN: 978-1-63563-874-5

Resources
None.

LEARNING OUTCOMES AND GOALS:
Institutional Learning Outcomes
☐1) Communication – to communicate effectively.
☒2) Inquiry – to apply critical, logical, creative, aesthetic, or quantitative analytical reasoning to formulate a judgement or conclusion.
☐3) Social Consciousness – to understand what it means to be a socially conscious person, locally and globally.
☐4) Responsibility – to recognize how personal choices affect self and society.

Course Outcomes and Competencies

1. Identify the physical properties and recognize the process of forming different types of metals.
2. Recall terminology and demonstrate through testing the various mechanical properties of metal.
3. Display proficiency with both the ferrous and nonferrous coding system.
4. Understand and experiment with the heat-treating process of different metals.
5. Know and evaluate non-destructive testing methods.