



MONROE COUNTY  
COMMUNITY COLLEGE

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# Course Outcome Summary

**Required Program Core Course**

**WELD 105 Welding Metallurgy**

## Course Information

Division	ASET
Contact Hours	60
Theory	30
Lab Hours	30
Total Credits	3

**Prerequisites: WELD 100 and MATL 101**

## Course Description

This course covers the metallurgical aspects of the welding of common engineering metals such as plain carbon, alloy and stainless steels, aluminum and cast irons. The selection of filler metals, transfer and recovery of alloying elements and the design of preheating and post heating cycles is also emphasized. Incidences of defects such as cracking and porosity and factors affecting these will also be discussed.

**This course is a required core course for students pursuing an AAS in Welding Technology.**

## Program Outcomes Addressed by this Course:

Upon successful completion of this course, students should be able to meet the program outcomes listed below:

- A. Follow procedures to deposit sound welds using Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Flux Cored Arc Welding (FCAW), and Gas Tungsten Arc Welding (GTAW) processes.**
- B. Identify weld defects, explain methods to repair defects, and demonstrate proper defect repair.**
- C. Explain knowledge of basic material and welding metallurgy.**



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## Course Outcomes

In order to evidence success in this course, the students will be able to:

1. Evaluate the effects of welding temperature on microstructure, mechanical properties and residual stress/distortion:

Applies to Program Outcome

C. Explain knowledge of basic material and welding metallurgy.

2. Determine weld metal chemistry based on filler metal composition, base metal composition and welding parameters and its effect on weld metal properties:

Applies to Program Outcome

C. Explain knowledge of basic material and welding metallurgy.

3. Demonstrate knowledge of the metallurgical basis for weld defects:

Applies to Program Outcomes

B. Identify weld defects, explain methods to repair defects, and demonstrate proper defect repair.

C. Explain knowledge of basic material and welding metallurgy.

4. Specify the preheat, interpass and post weld heat treatment based upon structural and code requirements:

Applies to Program Outcomes

A. Follow procedures to deposit sound welds using Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Flux Cored Arc Welding (FCAW), and Gas Tungsten Arc Welding (GTAW) processes.

C. Explain knowledge of basic material and welding metallurgy.

Updated 02/15/2020

M. Jager