



**THE OHIO STATE UNIVERSITY**  
COLLEGE OF ENGINEERING

# Welding Metallurgy Laboratory I

## WELDENG 7611

**Credit Hours:**

1.00 - 1.00

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**Course Levels:**

Graduate (5000-8000 level)

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**Course Components:**

Lecture  
Lab

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**Course Description:**

Fundamental understanding of microstructure evolution in alloys and steels during heat treatment, as well as welding through various characterization techniques.

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**Prerequisites and Co-requisites:**

Prereq: Grad standing. Concur: 4101 or 7101, or permission of instructor.

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**Course Goals / Objectives:**

- Identification of microstructures and related properties in a variety of iron based alloys subjected to similar heat treatments, as well as, welding and post-weld heat treatment
  - Design of proper control methodologies to avoid weldability issues in steels
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**Course Topics:**

- Identification of microstructures and related properties in a variety of iron based alloys subjected to similar heat treatments
  - Evaluation of microstructure and hardness in welds and the similarity of the same to samples subjected to thermo-mechanical processing in a Gleeble thermal-mechanical simulator
  - Understanding of complex interaction between prior heat treatment, welding process and post-weld heat treatments on the final weld microstructure and properties
  - Design and implementation of control methodologies to avoid hydrogen assisted cracking in steel welds using published standards
  - Optimization of welding process, process parameters, welding consumable selection and post-weld heat treatment for structural steel welds using computational models and experimentation
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**Designation:**

Elective