



**THE OHIO STATE UNIVERSITY**  
COLLEGE OF ENGINEERING

# Fitness-for-Service of Welded Structures

## WELDENG 7240

**Credit Hours:**

2.00 - 2.00

---

**Course Levels:**

Graduate (5000-8000 level)

---

**Course Components:**

Lecture

---

**Course Description:**

The interrelationship of design, fabrication, nondestructive evaluation, fracture mechanics, and reliability concepts in establishing the overall fitness-for-purpose of welded structures.

---

**Prerequisites and Co-requisites:**

Prereq: Grad standing, or permission of instructor.

---

**Course Goals / Objectives:**

- Understand basic fitness-for-service concepts
  - Ability to analyze and apply fracture mechanics design concepts to welded structures
  - Ability to analyze and apply fatigue life prediction methods to welded structures
  - Ability to apply fitness-for-service methods and standards for design of new and for life-assessment of in-service welded structures
-

**Course Topics:**

- Introduction to fitness-for-service and root causes of weld failure.
  - Fracture mechanics for brittle fracture.
  - Fracture mechanics for ductile fracture.
  - Fracture toughness testing.
  - Fatigue crack initiation and propagation.
  - Fatigue and fracture of welded components.
  - Fracture and fatigue control.
  - Fitness-for-service assessment procedures and standards.
  - Case studies.
- 

**Designation:**

Elective