Fitness-for-Service of Welded Structures

WELDENG 4240

Credit Hours:
2.00

Course Levels:
Undergraduate (1000-5000 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: 4201, and enrollment as a WeldEng-BS major; 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