

WELDENG 7202 (Approved): Welding Design

Course Description

Fundamentals of design and application of codes and standards for welded structures.

Prior Course Number: 621, 641

Transcript Abbreviation: Welding Design

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Graduate

Student Ranks: Masters, Doctoral

Course Offerings: Spring

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 3.0

Repeatable: No

Time Distribution: 3.0 hr Lec

Expected out-of-class hours per week: 6.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Prereq: Graduate Standing or permission of instructor.

Exclusions: Not open to students with credit for 621 and 641 or 4202.

Cross-Listings:

The course is required for this unit's degrees, majors, and/or minors: No

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.9999

Subsidy Level: Masters Course

Programs

Abbreviation	Description
WELDENG	Welding Engineering

General Information

This is a graduate level course that will be taught at the same time as WE4202. Lecture content will be the same as 4202, but graduate students will be required to submit a term project that may include a detailed design, a computer simulation or detailed review of research papers.

Course Goals

Ability to analyze structures including torsion, bending, pressure vessels, and columns.

Ability to analyze and design joints in welded structures.

Ability to analyze and design welded structures for dynamic and fatigue loading.

Ability to apply industry codes and standards to the design of welded joints in steel structures.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Essential elements in structural welding.	2.0							
Torsion and polar moment of inertia.	3.0							
Beam bending, area moment of inertia, and graphical methods for bending analysis.	5.0							
Stress, strain, and moment of inertia transformations and Mohr circle.	3.0							
Analysis of pressure vessels.	2.0							
Buckling of columns.	3.0							
Weld sizing and weld requirements for built-up members.	2.0							
Design of welded plate girders and AISC codes.	6.0							
Design of welded pressure vessels and ASME Boiler and Pressure Vessel Code.	6.0							
Design of structural connections and AWS D1.1 code.	5.0							
Design of welded structures for dynamic and fatigue loading.	5.0							

Grades

Aspect	Percent
Homework and quizzes	15%
Exam 1	20%
Exam 2	20%
Final exam	25%
Term Project	20%

Representative Textbooks and Other Course Materials

Title	Author
<i>Lecture Notes</i>	C. Tsai and A. Benatar

ABET-EAC Criterion 3 Outcomes

Course Contribution	College Outcome
***	a An ability to apply knowledge of mathematics, science, and engineering.
**	b An ability to design and conduct experiments, as well as to analyze and interpret data.
**	c An ability to design a system, component, or process to meet desired needs.
	d An ability to function on multi-disciplinary teams.
***	e An ability to identify, formulate, and solve engineering problems.
**	f An understanding of professional and ethical responsibility.
*	g An ability to communicate effectively.
*	h The broad education necessary to understand the impact of engineering solutions in a global and societal context.
**	i A recognition of the need for, and an ability to engage in life-long learning.

Course Contribution		College Outcome
**	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

WELDENG ABET-EAC Criterion 9 Program Criteria Outcomes

Course Contribution		Program Outcome
***	l	an ability to select and design welding materials, processes and inspection techniques based on application, fabrication and service conditions
**	m	an ability to develop welding procedures that specify materials, processes and inspection requirements
***	n	an ability to design welded structures and components to meet application requirements

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