

WELDENG 4002 (Proposed): Physical Principles in Welding Processes II

Course Description

Study of the application of physical principles in engineering of non-arc welding processes and equipment.

Prior Course Number: 600, 601, 651

Transcript Abbreviation: PHY PRN WLD PRO II

Grading Plan: Letter Grade

Course Deliveries: Greater or equal to 50% at a distance

Course Levels: Undergrad

Student Ranks: Junior, Senior

Course Offerings: Autumn

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 4.0

Repeatable: No

Time Distribution: 3.0 hr Lec, 1.0 hr Lab

Expected out-of-class hours per week: 8.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: WE 4001 or graduate standing. Open to WE or MSE majors only or with permission of instructor

Exclusions: WE600

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:

Subsidy Level: Baccalaureate Course

Programs

Abbreviation	Description
WELDENG	Welding Engineering

Course Goals

Understanding of major Resistance Welding processes, weld parameters, equipment, and applications.
Understanding of the fundamentals and theory of Resistance Welding.
Understanding of the fundamentals and theory of Solid-State Welding.
Ability to describe and understand the major Solid-State Welding processes, weld parameters, equipment, and industrial applications.
Understanding of the fundamentals and theory of High Energy Density welding processes.

Ability to describe and understand Laser and Electron Beam welding processes, weld parameters, equipment, and industrial applications.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Fundamentals of Resistance Welding processes	10.0							
Equipment, parameters, and applications for Resistance Welding processes	8.0							
Laboratory experiments - Resistance Welding, Arc Welding, Solid-State Welding and HED Welding			8.0					
Fundamentals of Solid-State Welding processes	10.0							
Equipment, parameters, and application of Solid-State Welding processes	8.0							
Fundamentals of Laser and Electron Beam Welding processes	8.0							
Equipment, parameters, and application of Laser and Electron Beam Welding processes.	8.0							

Grades

Aspect	Percent
MT 1	20%
mt 2	20%
HW, labs	20%
Final exam	40%

Representative Textbooks and Other Course Materials

Title	Author
<i>4001 Class Notes</i>	Dickinson, Farson, Phillips

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.
	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

Prepared by: Dave Farson