

WELDENG 4407 (Approved): Adhesive Bonding and Mechanical Joining of Plastics

Course Description

Fundamentals of adhesive bonding science and technology and methods for mechanical joining of plastics including fasteners, snap-fits, press-fits, swaging, and staking.

Prior Course Number: 707

Transcript Abbreviation: Adh Bond Plastics

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Undergrad

Student Ranks: Junior, Senior

Course Offerings: Spring

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 2.0

Repeatable: No

Time Distribution: 2.0 hr Lec

Expected out-of-class hours per week: 4.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Prereq: 620 or 4201 or permission of instructor. Open to WE or MSE majors only.

Exclusions: Not open to students with credit for WE 707.

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: Baccalaureate Course

Programs

Abbreviation	Description
WELDENG	Welding Engineering

Course Goals

Understand structure and properties of polymeric adhesives.
Ability to understand theories of adhesion.
Understand and be able to develop procedures for adhesive bonding.
Ability to analyze and design mechanical joints using fasteners.
Ability to analyze and design mechanical joints using snap and press fits.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Introduction to structure and properties of polymeric adhesives.	4.0							
Theories of adhesion.	4.0							
Adhesive bonding procedures and rapid curing methods.	4.0							
Design and testing of adhesive joints.	2.0							
Analysis and design of snap-fits.	5.0							
Analysis and design of press-fits.	3.0							
Analysis and design of bolted joints.	3.0							
Staking and swaging.	3.0							

Grades

Aspect	Percent
Homework and quizzes	30%
Mid-Term	30%
Final exam	40%

Representative Textbooks and Other Course Materials

Title	Author
<i>Adhesion and Adhesive Technology: an Introduction, 2nd Edition</i>	A.v. Pocius
<i>First Snap-Fit Handbook - Creating and Managing Attachments of Plastic Parts, 2nd Edition</i>	P.R. Bonenberger

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

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