

Engineering Program

Specialization Production and Computer Aided Manufacturing Technology
Course Number **20203212**
Course Title Welding Technology Workshop
Credit Hours (1)
Theoretical Hours (0)
Practical Hours (3)

Brief Course Description:

The student should practice Welding Technology; Safety considerations, shop practicing Fusion Welding; Arc welding (AW), Oxyfuel gas welding (OFW). Apply different Weld Joint of different, types of Joints, types of Welds. Resistance-Welding. Oxyfuel Gas Welding; Oxyacetylene Welding, Oxyfuel Welding. Solid-State Welding. Inspections of welding defects and welding quality.

Course Objectives:

At the end of this course student will be able to:

1. Distinguish between different welding techniques (principle and procedure, equipment and tools, and advantages and disadvantages) and hence to select welding technology suitable for application
2. Adjust welding parameters (voltage, flow ...)
3. Performing various welding processes (arc welding, Tungsten-Inert Gas (TIG) welding, Metal-Active Gas (MAG) welding and spot welding)
5. Inspect welding defects.
6. Apply the safety precautions during the execution of welding processes
7. Make projects by welding and assembly of specific parts

Detailed Course Description:

Number	Title	Content	Time
	Welding principles and safety precautions	Different welding techniques Welding methods (manual, mechanical, automated)	
	Types of Welding Processes		
	Fusion Welding	Arc welding (AW): General Technology Consumable Electrodes Processes Nonconsumable Electrodes Processes Analysis Electrical arc Electro-magnetic phenomenon Welding factors and parameters Tungsten-Inert Gas (TIG) welding Metal-Active Gas (MAG) welding	
		Oxyfuel gas welding (OFW): Oxyacetylene Welding Oxyfuel Welding Alternative Gases Other Fusion-Welding Processes	
	Resistance-Welding	Power Source in Resistance Welding Resistance-Welding Processes	
	Inspection of Weld defects	Weldability Weld Quality and welding defects: Incomplete penetration Porosity and cracks Inspection of surface defects Inspection of internal defects	

		Welding testing:	
	The Weld Joint	Types of Joints Types of Welds	

Evaluation Strategies:

Evaluation		Percentage	Date
Exams	Midterm	20%	
	Final Exam	50%	
Projects and Laboratory Assignments		30%	

Teaching Methodology:

- Lecturing
- Workshop practicing
- Projects

Text Books & References:

Text Books:

- Groover, Fundamentals of Modern Manufacturing, 4th Ed
- Kalpakjian, Manufacturing Engineering and Technology, 6th Edition in SI Units

References:

- Welding skills”, Miller, R. T.
- “Welding skills: workbook to accompany Miller”, Gosse.