

COURSE PLAN

FIRST: BASIC INFORMATION

College					
College	: Al-Karak University College				
Department	: Mechanical Engineering				
Course					
Course Title	: Introduction to Welding				
Course Code	: 020209122				
Credit Hours	: 3 (3 Theoretical, 0 Practical)				
Prerequisite	:				
Instructor					
Name	: Dr. Khaleel Abushgair				
Office No.	:				
Tel (Ext)	:				
E-mail	: abushgair@bau.edu.jo				
Office Hours	:				
Class Times	The building	Today	Start time	End time	Hall number
Text Book					
Title	:				

References

1. Modern Welding; last Edition Althouse/Turnquist/Bowditch/Bowditch Goodheart-Wilcox Co., Inc.
2. Welding Technology American Technical Society Chicago last edition,
3. J. W Giachino W. weeks G.s Johnson 2. Modern Welding, by A.D Althouse C.H Turnquist and W.A. Bowditch, South Holland Illinois, last edition

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

This course deals with fundamentals of Welding, principles of shielded metal arc welding (SMAW), gas tungsten arc welding (TIG), gas metal arc welding (MIG) and oxyfuel gas welding, modern welding technology such as electrical resistance welding, friction welding, thermit welding, explosive welding, cold pressure welding, submerged Arc welding, gas shielded arc welding, ultrasonic welding, electron beam welding, laser welding.

COURSE OBJECTIVES

The main objectives of this course are to enable the student to do the follows;

- Explain the processes and safety issues involved in usage of the various welding processes, the basics of welding ferrous and non-ferrous metals, welding equipment.
- Explain the welding process types such as arc welding, the fundamentals of weld and principle of arc welding, gas welding and their equipment.
- Explain the principle of different types of electrical resistance welding, fraction welding, thermit welding, modern welding technology such as Inert Gas arc welding, Submerged arc welding, Plasma arc welding, electro slag welding, electron -beam welding, Laser welding
- Explain how to weld the different metals, welding symbols, welding testing and inspection.

COURSE LEARNING OUTCOMES

On successful completion of this course, students are expected to be able to:

- CLO1. Understand basic metal welding process, fundamentals of welding including types of welding position and welding problem
- CLO2. Explain [gas welding equipment, supplies and gas welding process](#)
- CLO3. Explain how to cut materials using oxyacetylene gas, and cutting equipment and supplies for metals cutting
- CLO4. Explain [arc welding equipment, supplies and arc welding process](#)
- CLO5. Explain resistance welding, and modern welding technology such as laser welding, thermit welding, ultrasonic welding, electron beam welding, etc.
- CLO6. Explain welding methods for non-ferrous metals

COURSE SYLLABUS

Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
1	Introduction to welding	<ul style="list-style-type: none"> • What's welding • Objective of welding process • Heat source as a basis for classification, • other joining processes, • metals cutting processes • processes and safety issues involved in usage of the various welding gases 	CLO1	
2	Fundamentals of welding	<ul style="list-style-type: none"> • Selecting the appropriate welding process • metallurgy mechanical and physical properties of metals • types of joints • types of welding position • welding problems • producing good welds 	CLO1	
3	Gas welding equipment and supplies	<ul style="list-style-type: none"> • Gas welding rods and fluxes • oxygen and acetylene cylinders • welding Torches 	CLO2	

Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
		<ul style="list-style-type: none"> gas pressure regulators 		
4	Gas welding process	<ul style="list-style-type: none"> Selecting the welding rod and flux oxyacetylene flame characteristics Torch manipulation and movements weld with and without filler rod 	CLO2	
5	Oxyacetylene Cutting equipment and supplies	<ul style="list-style-type: none"> Cutting equipment using oxyacetylene Cutting conditions according to metals 	CLO3	
6	Arc welding process	<ul style="list-style-type: none"> Arc welding Equipment and supplies Welding power sources, DC and AC Electrodes Selecting a power source electric arc 	CLO4	
7	Arc welding process	<ul style="list-style-type: none"> required Current determine selecting the proper electrode welding positions types of joints weld preparation welding problems 	CLO4	
8	Midterm Exam			
9	Inert Gas Arc Welding	<ul style="list-style-type: none"> Gas arc welding principles Types of gas arc welding Gas tungsten arc welding process (GTAW) (TIG) striking the arc TIG instructions and practice. GMAW (MIG) principles, practice And techniques 	CLO4	
10	Inert Gas _Arc Welding Equipment and Supplies	<ul style="list-style-type: none"> Gas arc welding station equipment Inert gases (Helium, Argon, Carbon Dioxide) equipment (Cylinders, Regulators, Flowmeters on/off Valves) Arc welding power sources electrode holders Tungsten electrode Torch, Nozzles MIG unit 	CLO4	
11	Resistance Welding	<ul style="list-style-type: none"> introduction to Resistance welding Machines, Machines controls, electrodes Resistance spot welding, multiple spot welding seam welding projection welding flash welding upset 	CLO5	

Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
		<ul style="list-style-type: none"> • spike welding 		
12	Modern welding technology	<ul style="list-style-type: none"> • Submerged Arc welding technology and equipment • Plasma arc welding technology and equipment • Electro slag welding technology and equipment • Electron beam welding technology and equipment • Laser welding technology and equipment 	CLO5	
13	Modern welding technology	<ul style="list-style-type: none"> • Ultrasonic Laser welding technology and equipment • Thermit welding and equipment • Friction welding and their equipment • Pressure welding and equipment • Explosive welding 	CLO5	
14	Welding methods for nonferrous metals	<ul style="list-style-type: none"> • Weldability of metals • Welding Pipes, Tubes, and pressure vessels • Tools and Die Steels Welding • Cast Iron and Wrought Iron Welding 	CLO6	
15	Welding methods for nonferrous metals	<ul style="list-style-type: none"> • Copper and its alloys welding Problems • Aluminum and its alloys Welding methods Problems • Testing and inspecting welds joints methods 	CLO6	
16	Final Exam			

COURSE LEARNING RESOURCES

The methods used in teaching the program, are mentioned, sch as lectures, discussion sessions, proactivity, and other activities)

- Discussion and explanation sessions
- Practical activity and execution

ONLINE RESOURCES

1) <https://helpx.adobe.com/photoshop/tutorials.htm>

ASSESSMANT TOOLS



Assessment Tools	%
Projects and Quizzes	20%
MID Exam	30%
Final Exam	50%
Total Marks	100%

THIRD: COURSE RULES

ATTENDANCE RULES

Attendance and participation are extremely important, and the usual University rules will apply. Attendance will be recorded for each class. Absence of 10% will result in a first written warning. Absence of 15% of the course will result in a second warning. Absence of 20% or more will result in forfeiting the course and the student will not be permitted to attend the final examination. Should a student encounter any special circumstances (i.e. medical or personal), he/she is encouraged to discuss this with the instructor and written proof will be required to delete any absences from his/her attendance records.

GRADING SYSTEM

Example:

Average	Maximum	Minimum
Excellent	100%	90%
Very Good	89%	80%
Good	79%	70%
Satisfactory	69%	60%
Weak	59%	50%
Failed	49%	35%

REMARKS

{ The instructor can add any comments and directives such as the attendance policy and topics related to ethics }

COURSE COORDINATOR

Course Coordinator

Signature:

Date:

Department Head:

Signature:

Date: