

COURSE PLAN

FIRST: BASIC INFORMATION

College					
College	: Al-Karak University College				
Department	: Mechanical Engineering				
Course					
Course Title	: ARC Welding 2				
Course Code	: 020209223				
Credit Hours	: 3 (0 Theoretical, 3 Practical)				
Prerequisite	: 020209124				
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 covers the advance and professional skills of arc welding, shielded metal arc welding (SMAW), gas tungsten arc welding (TIG), gas metal arc welding (MIG). training in arc welding and machine shop safety practices, developing manipulative proficiency in the use of shielded metal arc welding (SMAW) in the horizontal (2F-2G), vertical (3F-3G), and overhead (4F-4G) and (6F-6G) positions on steel, filler metal classifications, welding power supplies, and welding safety, welding test plates and pipes.

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 advanced arc welding processes.
- Explain advanced arc welding process types in shield metal arc welding, TIG welding and MIG welding.
- Develop manipulative proficiency in the use of shielded metal arc welding (SMAW) in the horizontal (2F-2G), vertical (3F-3G), and overhead (4F-4G) positions on pipe and plate.

COURSE LEARNING OUTCOMES

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

CLO1. **Explain** advanced knowledge on arc welding, weld joint and positions, safety in work species

CLO2. **Perform** shielded metal arc welding(SMAW), win SMAW technology in horizontal, vertical and overhead positions, complete SMAW on pipes in all positions

CLO3. **Perform** how to metals cutting through arc cutting process, special cutting methods using arc cutting technology

CLO4. **Perform** tungsten ingot gas(TIG) welding, win TIG welding technology in various positions of horizontal, vertical and overhead, TIG welding on steel pipes

CLO5. **Perform** metal ingot gas(MIG) welding, complete MIG welding technology in various positions of horizontal, vertical and overhead, MIG welding on steel pipes

CLO6. **Perform** submerged arc welding technology and flus core arc welding(FCAW), complete submerged arc welding and FCAW technology in various welding positions

CLO7. **Perform** arc welding process of non-ferrous metals, testing and inspection on welding parts

COURSE SYLLABUS

Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
1	Introduction to arc welding and safety in welding workshops	<ul style="list-style-type: none"> • Course introduction • Welding and general shop safety • Personal protection equipment's (PPE) used in welding and functionality • Basic weld joints and positions • Measuring and cutting materials 	CLO1	
2	Shielded metal arc welding (SMAW)	<ul style="list-style-type: none"> • Shielded metal arc welding electrical circuit for arc welding • Welding electrodes & numbering • Types of machine AC/DC • Techniques for starting the arc • Practical experience in the use and application of shielded arc welding 	CLO2	

Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
3	Shielded metal arc welding (SMAW) practice	<ul style="list-style-type: none"> Practical experience in the use and application of shielded arc welding on various joint configurations in all position on plate (in the horizontal (2F-2G) and vertical (3F-3G)) Visual inspection of welded joints 	CLO2	
4	Shielded metal arc welding (SMAW) practice	<ul style="list-style-type: none"> Practical experience in the use and application of shielded arc welding on various joint configurations in all position on plate and overhead (4F-4G) Visual inspection of welded joints 	CLO2	
5	Shielded metal arc welding (SMAW) pipe welding practice	<ul style="list-style-type: none"> Practical experience in the use and application of shielded arc welding on various joint configurations in all position on pipes horizontal (2F-2G) and vertical (3F-3G) and overhead (4F-4G) and (6F-6G) Visual inspection of welded joints 	CLO2	
6	Shielded metal arc welding (SMAW) pipe welding practice	<ul style="list-style-type: none"> Practical using shielded metal arc welding (SMAW) for welding of different pipes horizontal (2F-2G) and vertical (3F-3G) and overhead (4F-4G) and (6F-6G) welding joints Practice using shielded metal arc welding (SMAW) on welding of steel pipes with different diameters Welding problems and solutions 	CLO2	
7	Arc cutting process	<ul style="list-style-type: none"> Air metallic arc cutting process Equipment for carbon arc cutting Metallic electrode arc cutting Air carbon arc cutting Oxygen arc cutting Applications to used arc cutting process in cutting of different plates and pipes with different thickness and poisons 	CLO3	
8	Midterm Exam			
9	Gas tungsten arc welding process (GTAW) (TIG)	<ul style="list-style-type: none"> Practical using gas tungsten arc welding process (GTAW) (TIG) for welding of workpieces with different horizontal (2F-2G) welding joints Practical using gas tungsten arc welding process (GTAW) (TIG) for welding of workpieces with different vertical (3F-3G) and vertical (3F-3G) and overhead 	CLO4	

Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
		(4F-4G) and (6F-6G) welding joints • Welding problems and solutions		
10	Gas tungsten arc welding process (GTAW) (TIG) pipe welding practice	<ul style="list-style-type: none"> • Practical using gas tungsten arc welding process (GTAW) (TIG) for welding of different pipes horizontal (2F-2G) and vertical (3F-3G) and overhead (4F-4G) and (6F-6G) welding joints • Practice using gas tungsten arc welding process (GTAW) (TIG) on welding of steel pipes with different diameters • Welding problems and solutions 	CLO4	
11	Gas Metal _Arc Welding (GMAW)(MIG)	<ul style="list-style-type: none"> • Practical using gas metal arc welding process (GMAW) (MIG) for welding of workpieces with different horizontal (2F-2G) welding joints • Practical using gas metal arc welding process (GMAW) (MIG) for welding of workpieces with different vertical (3F-3G) and vertical (3F-3G) and overhead (4F-4G) and (6F-6G) welding joints • Welding problems and solutions 	CLO5	
12	Gas Metal _Arc Welding (GMAW)(MIG) pipe welding practice	<ul style="list-style-type: none"> • Practical using gas metal arc welding process (GMAW) (MIG) for welding of different pipes horizontal (2F-2G) and vertical (3F-3G) and overhead (4F-4G) and (6F-6G) welding joints • Practice using gas metal arc welding process (GMAW) (MIG) on welding of steel pipes with different diameters • Welding problems and solutions 	CLO5	
13	Submerged Arc welding	<ul style="list-style-type: none"> • Submerged arc welding technology and their equipment • Practical using submerged arc welding for welding of workpieces with different horizontal (2F-2G) welding joints • Welding problems and solutions 	CLO6	
14	Flux Core arc welding (FCAW)	<ul style="list-style-type: none"> • Flux core arc welding (FCAW) technology and their equipment • Practical using flux core arc welding (FCAW) for welding of workpieces with different horizontal (2F-2G) welding joints • Welding problems and solutions 	CLO6	



Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
15	Arc 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 	CLO7	
16	Final Exam			

COURSE LEARNING RESOURCES

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

- Discussion and explanation sessions
- Practical activity and execution

ONLINE RESOURCES

1) <https://www.aws.org/home>

ASSESSMENT 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 DR Khaleel Abushgair

Department Head:

Signature:

Signature:

Date:

Date: