

COURSE PLAN

FIRST: BASIC INFORMATION

College

College : Al-Karak University College
 Department : Mechanical Engineering

Course

Course Title : ARC Welding 1
 Course Code : 020209124
 Credit Hours : 2 (0 Theoretical, 2 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 the fundamentals and principles of arc welding, shielded metal arc welding (SMAW), gas tungsten arc welding (TIG), gas metal arc welding (MIG), developing 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 steel, filler metal classifications, welding power supplies, and welding safety.

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 arc welding processes, and fundamentals of arc welding.
- Explain the arc welding process types such as shield metal arc welding, principle of arc welding, gas welding and their equipment
- Explain inert gas arc welding (TIG, MIG) technology, arc welding methods for non-ferrous metals.
- 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.

COURSE LEARNING OUTCOMES

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

CLO1. **Explain** a basic knowledge on arc welding such as joint designs, positions used in industry, arc blow, arc length and the effects by arc length, welding current and circuit voltage, etc.

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

CLO3. **Perform** how to metals cutting through arc cutting process

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

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

CLO6. Explain submerged arc welding technology and their equipment, complete submerged arc welding technology in various welding positions

CLO7. **Perform** arc welding process of non-ferrous metals

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	Fundamentals of arc welding	<ul style="list-style-type: none"> • Selecting the appropriate arc welding process • Metallurgy mechanical and physical properties of metals • Types of joints • Types of welding position • Welding problems • Producing good welds • Gas welding rods and fluxes 	CLO1	

Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
		<ul style="list-style-type: none"> Welding Torches Gas pressure regulators 		
3	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 	CLO1	
4	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	
5	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)) Visual inspection of welded joints 	CLO2	
6	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 vertical (3F-3G) Visual inspection of welded joints 	CLO2	
7	Shielded metal arc welding (SMAW) practice	<ul style="list-style-type: none"> Practical using Shielded metal arc welding (SMAW) for welding of different workpieces with different horizontal (2F-2G) and vertical (3F-3G) welding joints Practice using Shielded metal arc welding (SMAW) on welding of steel pipes Welding problems and solutions 	CLO2	
8	Midterm Exam			
9	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 with different thickness and poisons 	CLO3	

Week	Topic	Topic details	Related L.O. and Reference (chapter)	Proposed assignments
10	Gas tungsten arc welding process (GTAW) (TIG)	<ul style="list-style-type: none"> Gas arc welding principles Types of gas arc welding Inert gases (helium, argon, carbon dioxide) equipment (cylinders, regulators, flowmeters on/off valves) Gas tungsten arc welding process (GTAW) (TIG) Tungsten electrode torch, nozzles 	CLO4	
11	Gas tungsten arc welding process (GTAW) (TIG) practice	<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) welding joints Welding problems and solutions 	CLO4	
12	Gas Metal _Arc Welding (GMAW)(MIG)	<ul style="list-style-type: none"> Gas metal arc welding station equipment Electrode holders GMAW (MIG) principles, practice and techniques 	CLO5	
13	Gas Metal _Arc Welding (GMAW)(MIG) practice	<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) welding joints Welding problems and solutions 	CLO5	
14	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	
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, sch as lectures, discussion sessions, practivity, and other activities)
 -Discussion and explanation sessions
 -Practical activity and execution

ONLINE RESOURCES

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

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 DR Khaleel Abushgair

Department Head:

Signature:

Signature:

Date:

Date: