

COURSE PLAN

FIRST: BASIC INFORMATION

College					
College	: Faculty of Karak - Balqa Applied University				
Department	: Mechanical Engineering				
Course					
Course Title	: Construction of Welding Design				
Course Code	: 020209221				
Credit Hours	: 2 (2 Theoretical, 0 Practical)				
Prerequisite	: 020209122				
Instructor					
Name	: Dr. Jamil Haddad				
Office No.	:				
Tel (Ext)	:				
E-mail	: drjamil@bau.edu.jo				
Office Hours	:				
Class Times	The building	today	Start time	End time	Hall number
Text Book					
Title	: Design of welded steel structures: principles and practice(Utpal K. Ghosh)				

References

1. Welded design: theory and practice(John hicks)
2. SHIGLEY'S MECHANICAL ENGINEERING DESIGN, NINTH EDITION

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

This course deals with welding workshop drawing, importance of identifying and using the right material for a job, need for weld design & its effects on welding cost, basic types of joints and welded joint features, basic weld symbols and welding symbols that include all the information, the factors to be considered while designing a welding joint, importance of effective, factor influencing welding costs, how to reduce welding cost, calculation of cost of welding project.

COURSE OBJECTIVES

The objectives of this course are to enable the student to do the following :

- Explain welding workshop drawing
- Explain importance of using the right material for a job
- Explain weld design and its advantages
- Develop basic types of joints, welds and weld symbols
- Define and understand importance of effective cost, and calculate the welding cost

COURSE LEARNING OUTCOMES

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

- CLO1. Identify the difference types of welding workshop drawings
- CLO2. Explain importance of identifying and using the right material for a job
- CLO3. Explain need for weld design & its effects on welding cost
- CLO4. Explain basic types of joints and welded joint features
- CLO5. **Identify** and interpret weld symbols
- CLO6. Explain factors to be considered while designing a welding joint
- CLO7. Explain importance of effective cost
- CLO8. Explain the factors influencing welding costs
- CLO9. **Estimate** the welding cost

COURSE SYLLABUS

Week	Unit	Content	Related L.O. and reference (Chapter)	Proposed assignments
1	Welding workshop drawing	<ul style="list-style-type: none"> • Understand the use of drawing terms • Ability to identify the parts of a drawing • Ability to identify different types of engineering drawing 	CLO1	
2	Importance of identifying and using the right material for a job	<ul style="list-style-type: none"> • Understand the properties of different materials • Understand how industry classifies material • Identify and name the typical standard shapes used in industry • Understand how different materials are described in a bill of material 	CLO2	
3	The need for weld design & its effects on welding cost	<ul style="list-style-type: none"> • Understand weld design and its advantages. • Understand the economic aspect of weld design. 	CLO3	
4	The need for weld design & its effects on welding cost	<ul style="list-style-type: none"> • Understand the influence of welding process on weld design 	CLO3	
5	The basic types of joints and welded joint features	<ul style="list-style-type: none"> • Describe the basic types of joints. • Understand the types of welds. • Explain with aid of sketches the features of butt & fillet welds. • Understand with sketches the following joint preparation recommended for various arc welding processes: • Understand flanged square butt, single V, single U, double- V, double- U, etc. • Understand the following edge preparation flame cutting (bevel or J penetration to give a V or U between 	CLO4	

Week	Unit	Content	Related L.O. and reference (Chapter)	Proposed assignments
		butted plates)		
6	The basic types of joints and welded joint features	<ul style="list-style-type: none"> • Planning (Bevel or J). • Shearing (Bevel to maximum of 25mm thickness) • Chipping • Understand the five basic types of joints • Explain the limit of application of above. • Understand the features of butt build-up by prior welding • Understand edge preparation using methods in 2.5 above 	CLO4	
7	Basic weld symbols	<ul style="list-style-type: none"> • What weld symbols are, and why they are used • Standard weld symbols • Understand the interpretation of welding symbols 	CLO5	
8	Midterm Exam			
9	Interpret welding symbols	<ul style="list-style-type: none"> • Understand the following as used on welding symbols: <ol style="list-style-type: none"> a) Weld all around, Field weld, Weld length, Intermittent weld, Weld contour symbols, Finish symbols, Fillet welds, Unequal leg fillet welds, Groove welds 	CLO5	
10	The factors to be considered while designing a welding joint	<ul style="list-style-type: none"> • Understand the factors under the following headings: <ol style="list-style-type: none"> a) Service requirement, Types of loading, Type of edge preparation 	CLO6	
11	The factors to be considered while designing a welding joint	<ul style="list-style-type: none"> • Understand the factors under the following headings: <ol style="list-style-type: none"> a) Type of metal, Welding position and accessibility, Cost of edge preparation 	CLO6	
12	Know the importance of Effective	<ul style="list-style-type: none"> • Importance of effective costing • Define costing. • Explain effective costing under the following headings: <ol style="list-style-type: none"> a) Profit, Workers bonus, Replacement of equipment, Purchase of modern equipment, Organization expansion, Operational overhead 	CLO7	
13	The factors influencing welding costs	<ul style="list-style-type: none"> • Understand the factors influencing welding costs • Understand the factors under the 	CLO8	



Week	Unit	Content	Related L.O. and reference (Chapter)	Proposed assignments
		following headings a) Types of metal to be welded, Types of welding electrode and size, Electricity, Oxygen, Welding gases, Welding fluxes, Locations of weld, Weld time, Capital expenditure, Depreciation of welding equipment about costs, Metal edge preparation, Pre-heating, Post weld treatment, Welding process used		
14	Reduce welding cost	<ul style="list-style-type: none"> • Understand welding cost • Understand how good workshop layout can reduce welding cost • Understand the importance of using correct welding technique • Explain the need to use the correct welding process • Understand the use of appropriate electrode and how to take proper care of electrode 	CLO9	
15	Calculation of cost of welding project	<ul style="list-style-type: none"> • Understand the calculation of Welding Cost • Define fusion constant and explain how it can be used to calculate welding cost. • Define fusion speed and how it can be used to calculate welding cost. • Understand how to add the worker's pay to the cost of the weld. • Understand how to determine the percentage profit to be charged 	CLO9	
16	Final Exam			

COURSE LEARNING RESOURCES

The effectiveness of teaching in this course depends on making students familiar with welding workshop drawing, importance of identifying and using the right material for a job, need for weld design & its effects on welding cost, basic types of joints and welded joint features, basic weld symbols, to interpret welding symbols that include all the information that could be used on them, the factors to be considered while designing a welding joint, importance of effective, factor influencing welding costs, how to reduce welding cost, calculation of cost of welding project.

Teaching methods:

- Problem-solving skills: through application of these principles to basic engineering problems.

- Online research skills on topics related to course objectives and recent developments in the field of mechanical engineering (welding and plumbing).
- Learning skills and adaptability: Developed by transferring students and reconfiguring work teams to enable them to adapt to other individuals from time to time.

ONLINE RESOURCES

- 1) <https://www.vitalsource.com/>
- 2) Library Genesis (libgen.rs)

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

Signature:

Date:

Department Head:

Signature:

Date: