



BENHA UNIVERSITY



FACULTY OF ENGINEERING AT SHOUBRA

COURSE SPECIFICATIONS (2014-2015)

Model No.12

Course Specifications: Metal Joining (welding)

University: Benha University

Faculty: Faculty of Engineering at Shoubra

Department offering the program: Mechanical Engineering Department

Department offering the course: Mechanical Engineering Department

1- Course Data

Course Code: MDP452

Course Title: Metal-Joining-welding

Specialization: production Mechanical Engineering department

Course Type: Elective

Study Year: Fourth Year

Teaching Hours: Lecture: 3

Tutorial: 2

Practical: 0

Total: 5

2- Course Aim

For students undertaking this course, the aims are to:

1. Be aware of and exercise correct safety precautions for welding processes, destructive and non-destructive testing techniques.
2. Define basic welding techniques and state their advantages and limitations

3- Intended Learning Outcomes of Course (ILO's)

- a. **Knowledge and Understanding Skills:** On completing this course, students will be able to demonstrate the knowledge and understanding of:
 - a.1) Characteristics of welding and state uses of welding. (A3)
 - a.2) Fusion welding and state uses of welding. (A5)
 - a.3) Thermal methods of joining metals. (A13)
- b. **Intellectual Skills:** At the end of this course, the students will be able to:
 - b.1) make engineering calculations in order to design facilities layout. (B2)
 - b.2) design and analyze the size of a groove and fillet welds. (B11)
 - b.3) Select appropriate welding method considering design requirements. (B18)
- c. **Practical and Professional Skills:** On completing this course, the students are expected to be able to:
 - c.1) design and manufacture a sample using welding process. (C3)
 - c.2) Use basic workshop equipment safely. (C15)
- d. **General and Transferable Skills:** At the end of this course, the students will be able to:
 - d. 1) Effectively manage tasks, time, and resources. (D6)
 - d. 2) Search for information and engage in life-long self-learning Design of welding joints. (D7)



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4- Course Contents

Week no.	Topics
1	Welding and Cutting Processes
2	Safety in welding
3	Joint Design and Welding Terminology
4	Oxy-acetylene welding and cutting process
5	Oxy-acetylene welding and cutting process
6	Shielded Metal Arc Welding (SMAW)
7	Shielded Metal Arc Welding (SMAW)
8	Midterm exam
9	Distortion control and welding symbols
10	Gas Metal Arc Welding (GMAW)
11	Gas Tungsten Arc Welding (GTAW)
12	Allied joining processes
13	Weld Testing Methods
14	Layout of welding workshop
15	Final exam

5- Teaching and Learning Methods

- 5.1 Lectures
- 5.2 Seminar / workshop
- 5.3 Class activity
- 5.4 Case study
- 5.5 Assignments / homework

6- Teaching and Learning Methods of Disables

- 3. Nothing.

7- Student Assessment

a- Student Assessment Methods

- 1. Four assignments to assess knowledge and intellectual skills.
- 2. Two quizzes to assess knowledge, intellectual and professional skills
- 3. Mid-term to assess knowledge, intellectual, professional and general skills.
- 4. Final exam to assess knowledge, intellectual, professional and general skills.

b- Assessment Schedule

NO.	Assessment	Week
1	Assignments	4, 9, 10, 12
2	Quizzes	4, 12
3	Mid-term exam	8
4	Final exam	15

c- Weighting of Assessments

Assessment	Weight (%)
Mid-Term Examination	20 %
Final-Term Examination	64 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	16 %
Other types of assessment	0 %
Total	100



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FACULTY OF ENGINEERING AT SHOUBRA

COURSE SPECIFICATIONS (2014-2015)

8- List of References

1. Modern welding, by Althouse, et all., The GOODHEART-willcox Co., 2004
2. Welding Fundamentals, by Mike Gellerman, Delmar Publishers, ITP USA, 1st Edition,1996.
3. Welding Practice, by Brain D. Smith, Arnold Publishers, London, 1st Edition, 1996.

Course Coordinator: Prof. Dr. Abdelkader A. Ibrahim

Head of Department: Prof. Dr. Osama Ezzat Abdelatif



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FACULTY OF ENGINEERING AT SHOUBRA

COURSE SPECIFICATIONS (2014-2015)

Model No.11A

Course Specifications: Metal Joining (welding)

University: Benha University

Faculty: Faculty of Engineering at Shoubra

Department offering the program: Mechanical Engineering Department

Department offering the course: Mechanical Engineering Department

Matrix of Knowledge and Skills of the Course						
no.	Topics	Week no.	Knowledge and Understanding Skills	Intellectual Skills	Practical and Professional Skills	General and Transferable Skills
1	welding and Cutting Processes	1	a1	b2		d1
2	Safety in welding	2	a1	b2	c1	
3	Joint Design and Welding Terminology	3	a2	b1	c1	
4	Oxy-acetylene welding and cutting process	4	a2	b1		d1
5	Oxy-acetylene welding and cutting process	5	a2	b3		d2
6	Shielded Metal Arc Welding (SMAW)	6	a3	b3	c3	
7	Shielded Metal Arc Welding (SMAW)	7	a3	b1	c2	
8	distortion control and welding symbols	8	a1	b1		d3
9	Gas Metal Arc Welding (GMAW)	9	a2	b4	c1	
10	Gas Tungsten Arc Welding (GTAW)	10	a2	b2	c3	
11	Allied joining processes	11	a3	b2		d2
12	Weld Testing Methods	12	a2	b4		d2
13	layout of welding workshop	13	a1	b4	c2	

Course Coordinator: Prof. Dr. Abdelkader A. Ibrahim

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COURSE SPECIFICATIONS (2014-2015)

Matrix of Course Aims and ILO's

Course Title: Metal-Joining (Welding)

Course Code: MDP452

Teaching Hours: Lecture: 3 Tutorial: 2 Total: 5

Major or minor element of program: Major

Program on which the course is given: B.Sc. Mechanical production Engineering

Department offering the program: Mechanical Engineering Department

Academic year / level: 2014-2015 Fourth Year / First Semester

Date of specifications approval: 2014

Course aims	Basic Knowledge	Intellectual Skills	professional Skills	General Skills
1 Be aware of and exercise correct safety precautions for welding processes, destructive and non-destructive testing techniques, and state their advantages and limitations	a3,a5	b2,b18	c3,c15	d6,d7
2 Define basic welding techniques	a13	b11	c3,c15	d6

Course Coordinator: Prof. Dr. Abdelkader A. Ibrahim

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