Academic Program Description Form

University Name: Diyala

Faculty/Institute: Engineering

Scientific Department: Materials engineering

Academic or Professional Program Name: Bachelor of Materials engineering

Final Certificate Name: Bachelor of Materials engineering

Academic System: course

Description Preparation Date: 24-6-2024

File Completion Date: 24-6-2024

Signature:

Head of Department Name: Suha K. Shihab

Date: 25/6/2024

Signature:

Scientific Associate Name: Jabbar Gattmah

Date: 25/6/2024

The file is checked by: Salah N. Farhan

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 25/6/2024

Signature:

Approval of the Dean

Prof. Dr. Anees A. Khadom

Course Name : Welding Metallurgy

1. Program Vision

The vision of the department is to become creative pioneers in effective engineering education, scientific research and community service with a commitment to total quality and cooperation with various engineering authorities locally and internationally in our field of specialization and aspiration to lead in teaching materials engineering sciences

2. Program Mission

Mission of the Department Exerting efforts to build, train and qualify capabilities with high professionalism, conduct applied research, provide specialized advisory services in materials engineering sciences and fields, and provide advanced and accredited engineering education to meet the needs of departments and institutions.

3. Program Objectives

1- Preparing and qualifying engineers specialized in materials engineering sciences through diversification in learning and teaching methods and training students to apply the acquired knowledge and skills to solve real problems.
2- The department seeks to provide distinguished academic programs in the field of materials engineering sciences in both theoretical and applied aspects that comply with international standards of academic quality.
3- Encouraging and developing scientific research in the fields of materials engineering in terms of design, manufacture and selection of materials, which include metal, ceramic, polymeric, composite materials, in addition to recycling and manufacturing materials.
4- Providing a stimulating environment for faculty members to develop their educational and research capabilities and skills.
5- Providing students with the ability to self-learning, personal development and work in groups. Events

4. Program Accreditation

5. Other external influences

6. Program

هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	5	6	4.24 %	
متطلبات الكلية	9	20	14.20 %	

				متطلبات القسم
Graduation Requirements	-	-	-	**التدريب الصيفي**
				أخرى

7. Program Description				
Credit Hours		Course Name	Course Code	Year/Level
practical	theoretical			
2	2	Welding metallurgy	MAE 319	**First \Third**

8. Expected Learning Outcomes of the Program	
	Knowledge
1- Introducing students to different welding methods 2- Introduce students to the metal structure formed during the welding process 3- *Introduce students to the weldability of some important metals*	

9. Teaching and learning strategies

The usual theoretical presentation method using the writing board and depending on the style (how and why) of the subject and according to the teaching curriculum of the subject. The method of theoretical presentation using the device (data show) and depending on the method (how and why) of the subject and according to the teaching curriculum of the subject.• The method of laboratory presentation using special devices to measure the different properties of the material under experiment

10. Evaluation methods

Direct questions in a manner (how and why) of the topic during the theoretical and practical lecture.
Evaluation is done through daily and monthly tests, student attendance rate, laboratory reports for each experiment and test, behavior in addition to the final exam
. • Sudden exams during the theoretical and practical lecture. • Semester exams for the theoretical and practical side. • Final exams for the theoretical and practical side.
d. General and rehabilitative skills transferred (other skills related to employability and personal development).
D1- Developing the student's ability to perform duties and deliver them on time.
D2- Logical and programmatic thinking to find software solutions to various problems.
D3- Developing the student's ability to dialogue and discussion.
D4- Developing the student's ability to deal with modern technology, especially the Internet.

11. Faculty

Faculty Members

Preparation of the teaching staff	Special requirements/skills	Specialization	Academic Rank

		if any			
lecturer	**angel**		**special**	**year**	
	angel		special		Assistant Professor

Professional Development

Orientation of new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level
In addition to passing the courses of teaching methods and language safety, the department works on development courses and workshops to prepare and guide new teaching members

Professional development for faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.
Using learning platforms and electronic methods to display lectures, seminars and reports, display educational videos and conduct lectures accompanied by practical application.

12. Acceptance Criterion

Setting regulations related to enrollment in the college, whether central or other

13. The most important sources of information about the program

-Richard Little, Welding and Welding Technology, McGraw Hill, 2001, 1st edition.

-Fundamentals and Details of Laser Welding 2020

-Metals Handbook-Welding, Brazing and Soldering, American Society forMetals, 1993, 10th edition, Volume 6, USA

-Technical document, MMAW, Aachen, ISF, Germany, (2005)
-R S Parmar, Welding process and technology, Khanna Publisher, New Delhi

14. Program Development Plan

مخطط مهارات البرنامج															
Learning outcomes required from the program															
القيم				المهارات				المعرفة				اساسي أم اختياري	Course Name	Course Code	Year/Level
4C	3C	2c	1C	4b	3b	2b	1b	A4	A 3	A 2	A 1				
												Essential	Welding metallurgy	MAE 319	Third/First

- **Please tick the boxes corresponding to the individual learning outcomes from the program subject to evaluation**

7

Course Description Form

1. Course Name	***Welding Metallurgy***
2. Course Code	***MAE 319***
3. Semester / Second Year / Third	
4. Date of preparation of the description 11-8-2024	
5. Available attendance formats	
6. Number of Hours (Total) / Number of Units (Total) 4/3	
7. Name of the course administrator (if more than one name is mentioned)	
Name: A.Eng. DabeerAhmed Shehab Email: ***abeerahmedshihab@gmail.com***	
8. Course Objectives	
..	1) Achieving the University's objectives within the field of materials engineering; (2) Gives a correct education in the fundamentals of materials engineering ; (3) Develop the skills and confidence necessary to solve, based on engineering and scientific principles, problems in the industrial sector and other industries for which materials engineering is the essential element; (4) Continue to find high-quality graduates; (5) Providing education compatible with the needs of the labor market linked to the Engineers Syndicate. (6) Understand the most important traditional processes

11. Course structure

Evaluation method	Method of education	Name of the unit/course or topic	Required Learning Outcomes	Hours	The week
Daily exams + practical experiences + monthly exams	Lectures displayed in Power Point format	Introduction - Linkage	The teacher demonstrates the principle and theory of connecting mechanical parts	2	First
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Welding classification process	Recognize the main principles of the properties of welding processes	2	Second
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Welding Classification Process – Welding vs. Other Manufacturing Processes	Identify the classification of welding processes	2	Third

Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Energy density and welding process	recognize the energies of heat sources in welding processes	2	Fourth
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Physics of arc welding electrophoresis	Identify the mechanism of work of the welding method	2	V
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Effect on the corrosion process in the welding joint	recognize chemical reactions between the materials that make up a welding joint,	2	Sixth
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Solid state welding	Identify the mechanism of work of the welding method	2	Seventh
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Heat flow in welding and residual pressures in welding joints	Identify the mechanism of work of the welding method	2	Eighth
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Steel	Identify the weldability of some metals	2	Ninth
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Aluminum	Identify the weldability of some metals	2	X
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Welded joint design	Identify the types of welding joints designs	2	Eleven
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Welded joint design	Identify the types of welding joints designs	2	Twelfth

Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Joint welding inspection and testing	Identify the types of welding joints tests	2	Thirteenth
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Inspection and testing of common welding joints	Identify the types of defects in welding joints	2	Fourteenth
Daily exams + practical experiences + monthly exams	Lectures displayed in PowerPoint format	Welding metal hardening	Identify the hardening phases of welding metal and the factors affecting it	2	Fifteenth

10. Course Evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student such as daily preparation and daily, oral and monthly exams editorial and reports .... etc	
11. Learning and Teaching Resources	
There are no textbooks for the subject	Required textbooks (methodology, if any)

-Richard Little, Welding and Welding Technology, McGraw Hill, 2001, 1st edition. -Fundamentals and Details of Laser Welding 2020 -Metals Handbook-Welding, Brazing and Soldering, American Society forMetals, 1993, 10th edition, Volume 6, USA	Main references (sources)
Technical document, MMAW, Aachen, ISF, Germany, (2005)	Recommended supporting books and references (journals, reports..)
-R S Parmar, Welding process and technology, Khanna Publisher, New Delhi	Electronic References, Websites