

Course E-Syllabus

Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	2/3/24/2023
	The Date of the Deans Council Approval Decision	23/01/2023
	Number of Pages	05

1	Course Title	Engineering Materials and Manufacturing Technology
2	Course Number	0908243
3	Credit Hours (Theory, Practical)	3
	Contact Hours (Theory, Practical)	3 hours theoretical
4	Prerequisites/ Corequisites	General Physics I – 0302101
5	Program Title	B.Sc. in Mechatronics Engineering
6	Program Code	
7	School/ Center	The University of Jordan
8	Department	Mechatronics Engineering Department
9	Course Level	2 nd year
10	Year of Study and Semester (s)	2023/2024 2nd Semester
11	Other Department(s) Involved in Teaching the Course	None
12	Main Learning Language	English
13	Learning Types	<input type="checkbox"/> Face to face learning <input checked="" type="checkbox"/> Blended <input type="checkbox"/> Fully online
14	Online Platforms(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams
15	Issuing Date	24/2/2024
16	Revision Date	21/3/2024

17 Course Coordinator:

Name: Prof. Osama Al-Habahbeh	Contact hours: As per schedule
Office number: Mechatronics Dept., 3 rd Floor	Phone number: 065355000 ext. 23031
Email: o.habahbeh@ju.edu.jo	

18 Other instructors:

None

19 Course Description:

Fundamentals of mechanical behavior of materials, Structure and manufacturing properties of metals, Phase-diagrams and heat treatment, Casting processes, Bulk deformation processes: forging, drawing, rolling, and extrusion. Sheet metal forming processes: blanking, piercing. Metal removal processes: Turning, Drilling, Milling, Shaping, and Broaching.

20. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program):

SO: 7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

21. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes):

1. Explain the development and future of industry
2. Understand material structure
3. Understand mechanical behavior of materials
4. Define phase diagrams
5. Understand heat treatment
6. Recognize manufacturing properties of metal
7. Understand casting processes, sheet metal forming processes: blanking and piercing.
8. Identify Bulk deformation processes: forging, drawing, rolling, and extrusion.
9. Define and analyze metal removal processes: Turning, drilling, milling, shaping, and broaching.

Course ILOs	The learning levels to be achieved					
	Remembering	Understanding	Applying	Analyzing	evaluating	Creating
1	✓	✓				
2	✓	✓	✓	✓		
3	✓	✓	✓	✓		
4	✓	✓	✓	✓		
5	✓	✓	✓			
6	✓	✓	✓			
7	✓	✓	✓	✓		
8	✓	✓	✓	✓		
9	✓	✓	✓	✓		

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program ILOs SOs	ILO (1) SO: 1	ILO (2) SO: 2	ILO (3) SO: 3	ILO (4) SO: 4	ILO (5) SO: 5	ILO (6) SO: 6	ILO (7) SO: 7
Course ILOs							
1							
2							
3							
4							✓
5							
6							✓
7							
8							
9							

23. Topic Outline and Schedule:

Week	Lecture	Topic	ILO/s Linked to the Topic	Learning Types (Face to Face/ Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1	1	Introduction/Outline	1	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
	2	Introduction to Manufacturing Process Selection	1	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
	3							
								Shown in 14 & 27
2	4	Fundamentals of Materials	2	E-Learning	E-Learning	Asynchronous	Oral & written exams	Shown in 14 & 27
	5	Crystal Structure of Metals	2	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
								Shown in 14 & 27
3	6	Work Hardening	3	E-Learning	E-Learning	Asynchronous	Oral & written exams	Shown in 14 & 27

	7 8	Plastic Deformation Mechanical Behavior	3	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
4	9	Ductility	3	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	10	Fatigue	3	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
5	11	Physical Properties of Materials	3	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	12 13	Metal Alloys Phase Diagram	4	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
6	14	Quenching Media	5	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	15	Metal Casting		Classroom	Classroom		Oral & written exams	Shown in 14 & 27
7	16	Structure-Property Relationships	6	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	17 18	Fluidity of Molten Metal Metal Casting Processes & Equipment	7	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
8	19	Expendable-Mold, Permanent-Pattern	7	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	20	Expendable-Mold, Expendable Pattern	7	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
9	21	Metal Rolling	8	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	22 23	Metal Forging Impression-Die	8	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
10	24	Metal extrusion	8	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	25	Drawing Process	8	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
11	26	Sheet Metal Forming, Bending Sheets	8	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	27 28	Fundamentals of Machining Mechanics of Cutting	9	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
12	29, 30	Machining processes, Turning Process	9	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	31, 32	Drilling, Machining processes	9	Classroom	Classroom		Oral & written exams	Shown in 14 & 27
13	33	Milling, Milling Machines	9	E-Learning	E-Learning	Asynch ronous	Oral & written exams	Shown in 14 & 27
	34	Planing and Shaping	9	Classroom	Classroom		Oral & written exams	Shown in 14 & 27

24. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	ILO/s Linked to the Evaluation activity	Period (Week)	Platform
In-class participation	30	TBA		TBA	Verbal evaluation
Midterm Exam	30	Midterm material		TBA	On campus
Final Exam	40	Post Midterm material		TBA	On campus
Total	100%				

25. Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

Each student should have a Textbook, Computer, Internet access & Scientific calculator.

26. Course Policies:

- A- Attendance policies: Attendance will be taken every class and University policy will be enforced.
 B- Absences from exams and submitting assignments on time: Absence not allowed and no Late submission.
 C- Health and safety procedures: As per University policy
 D- Honesty policy regarding cheating, plagiarism, misbehavior: Not tolerated as per University policy
 E- Grading policy: As mentioned in Evaluation Methods above.
 F- Available university services that support achievement in the course: Platforms, Instructor support, Administrative support.

27. References:

A- Required book(s), assigned reading and audio-visuals:

- YouTube Videos accessed via the provided links on Moodle.
- Chapters' handouts by Dr. Osama Al-Habahbeh. Accessed at: <http://elearning.ju.edu.jo/>
- Text book: Manufacturing Engineering and Technology, Serope Kalpakjian and Steven R. Schmid, Pearson, 7th Edition.

B- Recommended books, materials, and media: Reference books:

- Manufacturing Processes for Engineering Materials, Serope Kalpakjian, Steven R. Schmid
- Manufacturing Techniques for Materials: Engineering and Engineered, edited by T.S. Srivatsan, T.S. Sudarshan, K. Manigandan
- Manufacturing Technology: Materials, Processes, and Equipment, Helmi A. Youssef, Hassan A. El-Hofy, Mahmoud H. Ahmed.

28. Additional information:

Name of the Instructor or the Course Coordinator:

Signature:

Date:

Prof. Osama Al-Habahbeh

Name of the Head of Quality Assurance Committee/
Department

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Signature:

21/3/2024
Date:

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Name of the Head of Department

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Signature:

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Date:

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Name of the Head of Quality Assurance Committee/
School or Center

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Signature:

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Date:

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Name of the Dean or the Director

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Signature:

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Date:

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