

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Smart material technology		Module Delivery
Module Type	E		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	MECT 110		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGx1 UGII	Semester of Delivery	
Administering Department		College	
Module Leader	Assist. Prof. Rehab Fadhil	e-mail	rerefamo88@gmail.com
Module Leader's Acad. Title	Assist. lecturer	Module Leader's Qualification	Msc
Module Tutor	None	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	1/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	1. This course aims to provide a good platform to mechatronics engineering students to understand, the formation of alloys and there classification then to deal with the manufacturing process for the alloys 2. To prepare them for the selection of the proper alloy and use it in application location.
Module Learning Outcomes	To apply the knowledge of materials engineering and the manufacturing processes due to the selection of materials for robot production
Indicative Contents	-

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem)	59	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	41	Unstructured SWL (h/w)	3
Total SWL (h/sem)	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	3,5,6,10	LO #1,2,.....10
	Assignments	2	10% (10)	7, 8	LO # 8
	Seminar	1	10% (10)	11	LO # 11
Summative assessment	Midterm Exam	2 hr	10% (10)	12	LO # 1-12
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Introduction to Materials Engineering, bonds and crystal structures of materials,
Week 2	theoretical density Crystal lattice, dislocation, point defect,
Week 3	solidification and dendrite (The microstructures of metals under microscope)
Week 4	Scanning electron microscope (microstructures of metals)
Week 5	The mechanical properties of materials (tensile, Impact, Hardness
Week 6	Phase diagrams of 2 metals (revers lever rule) Solubility of metals (Phase diagrams)
Week 7	Eutectic structures
Week 8	Iron- Carbon phase diagram ,Microstructure of steel and cast iron
Week 9	Classification of steel (steel, stainless steel)
Week 10	Heat treatment of steel (annealing, quenching, normalizing, tempering)
Week 11	Aluminum and it's alloys, copper and it's alloys
Week 12	Light alloys Mg Ti
Week 13	introduction to manufacturing processes,
Week 14	casting of metals (sand casting, centrifuge casting, die casting...etc)
Week 15	cutting of metals (lathe milling drilling ,broaching)

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Recommended Texts	➤ Materials_Science_and_Engineering_- _An_Introduction 7th by William D. Callister, Jr.	yes

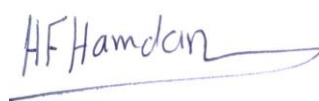
Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.


 د. هارون عبد الكاظم
 عميد الكلية

عميد الكلية : ا.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 25


 د. حسين فاضل حمدان

رئيس القسم : ا.د. حسين فاضل حمدان

التاريخ : 2026 / 3 / 25


 د. رحاب فاضل محمد

اسم التدريسي : م.م. رحاب فاضل محمد شهد

التاريخ : 2026 / 3 / 25