



Ministry of Higher Education and
Scientific Research - Iraq

University of Warith Al_Anbiyaa....
College of Engineering
Oil and Gas Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Physics and Thermodynamics			Module Delivery
Module Type	Basic			<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENG225			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level		UGII	Semester of Delivery	
Administering Department		OGE	College	Engineering
Module Leader	Fatima Ahmed Jasim			e-mail fatima.ahmed@uowa.edu.iq
Module Leader's Acad. Title		Asst. Lecturer	Module Leader's Qualification	
Module Tutor	2			e-mail
Peer Reviewer Name		Name	e-mail	
Scientific Committee Approval Date		01/06/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ENG212	Semester	3
Co-requisites module	1- It provides a broad foundation in the basic of science and engineering.	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none"> 1. The program has a strong emphasis on modern physics and its application to 21st century technology. 2. Our program builds on the existing research and teaching strengths of the Physics and Materials Science Division in cross-cutting areas such as novel 21st century materials, materials for energy, macromolecules, quantum mechanics to devices, surfaces, interfaces, and nanostructures, and computation, and is flexible enough to grow together with the research base of our division.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1- Graduates will have substantial experience with laboratory methods, data analysis, and computation.
Indicative Contents المحتويات الإرشادية	Engineering physics students will be well equipped to pursue research and development careers in new and emerging technologies such as properties of new materials, quantum electronics, nanofabrication and devices, quantum signal processing and quantum computing, related to emerging advances in electrical, mechanical and petroleum engineering.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Active learning techniques methods
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعاً

Structured SWL (h/sem)	90	Structured SWL (h/w)	6
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعياً	
Unstructured SWL (h/sem)	37	Unstructured SWL (h/w)	2.5
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعياً	
Total SWL (h/sem)	130		
الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10 LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12 LO # 3, 4, 6 and 7
	Projects /	1	10% (10)	Continuous All
	Report	1	10% (10)	13 LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7 LO # 1-7
	Final Exam	2hr	50% (50)	16 All
Total assessment		100% (100 Marks)		

Delivery Plan (Weekly Syllabus)**المنهاج الأسبوعي النظري**

	Material Covered
Week 1	History of nature science, electrical, charge, current.
Week 2	Resistance, resistivity, galvanometer, ammeter, voltmeter.
Week 3	Simple harmonic motion.
Week 4	Kinetic and potential energy
Week 5	Electric and magnetic properties of matter
Week 6	Insulators, semiconductor, conductor, superconductor.
Week 7	Diamagnetic, paramagnetic, ferromagnetic
Week 8	Nanotechnology
Week 9	Introduction: Zeroth law of thermodynamics: Definition of temperature, Zeroth law concept, Type of thermometers, Type of temperature scales, Kelvin experiment: gas thermometer
Week 10	Ideal gas Equation: Properties of matter, Temperature effect on matter, Thermal expansion laws Macroscopic description of ideal gas, Derivation of Ideal gas equation
Week 11	Heat: Heat and internal energy, Units of heat, Mechanical equivalent of heat, Specific heat capacity, Calorimetry, Latent heat Work: State variables, Transfer variables, Work in thermodynamics, PV diagrams, Energy transfer .
Week 12	The 1st law of thermodynamics: Isolated and open systems, Adiabatic processes, Adiabatic free expansion process Isobaric processes, Isochoric processes, Isothermal processes, Thermal expansion
Week 13	Engines and refrigerators: Work to heat, Heat engine, Thermal efficiency of heat engine, Heat pump (refrigerators), Refrigerator cycle (Sterling), Coefficient of performance
Week 14	2nd law of thermodynamics: Entropy Kelvin-Planck & Clausius forms, Reversible and irreversible processes Carnot engine and theorem, Carnot efficiency
Week 15	Preparatory week before the final Exam
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electric Charge and Field, Guide to Semiconductor Engineering, Magnetic and Electric book. Publish Papers	Yes
Recommended Texts	Physics text book, Series of nanotechnology	
Websites	Elsevier, Springer, Physics library online, https://openlibrary.org/subjects/physics ,	

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.