

MODULE DESCRIPTION FORM

Module Information			
Module Title	Electromagnetic		Module Delivery
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	LAER211		
ECTS Credits	6		
SWL (hr/sem)	93 H/Sem.		
Module Level	2	Semester of Delivery	
Administering Department	Laser and optoelectronics Eng.	College	College of Engineering
Module Leader	Hanaa.m.hadad		e-mail hanaa.m.hadad@alayer.edu.iq
Module Leader's Acad. Title	Msc	Module Leader's Qualification	Ph.D.
Module Tutor	Hanaa.m.hadad		e-mail hanaa.m.hadad@alayer.edu.iq
Peer Reviewer Name			e-mail Hasnaa.Mohammad@alayer.edu.iq
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
Prerequisite module		Semester	1
Co-requisites module		Semester	4

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Introduce vector calculus concepts relevant to electromagnetic fields. Understand electrostatics, magnetostatics, and time-varying fields. Apply Maxwell's equations to practical engineering problems.



Relate electromagnetic field theory to laser and optoelectronic device applications			
Module Learning Outcomes	Knowledge	A2	A2.1Recognize Coordinates system, Coulomb’s law and Electric field. A2.2Classify operator, point charge and Electrostatic images method. A2.3 Apply coulomb’s law, Gauss’s law.
	skills	B1	B1.1 Function efficiently as an individual. B1.2 Function as a member of multidisciplinary and multicultural teams.
	Ethics	C1	C1.1Define professional and ethical responsibilities. C1.2 Demonstrate diversity in their commitment to ethical responsibilities.
Indicative Contents	Part A – Mathematical Foundations Vector analysis: gradient, divergence, curl. Coordinate systems: Cartesian, cylindrical, spherical. Part B – Electrostatics Coulomb’s law and electric field intensity. Electric flux density, Gauss’s law. Electric potential and energy. Part C – Magnetostatics Magnetic flux, permeability, inductance. Magnetic materials and boundary conditions. Part D – Time-Varying Fields and Maxwell’s Equations Faraday’s law of induction. Displacement current and continuity equation. Maxwell’s equations in differential and integral forms.		
Learning and Teaching Strategies			
Strategies	Discussions • Tutorial and graphics • Problem solving • Brain storming • Problem Solving		



Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6.2
Unstructured SWL (h/sem)	57	Unstructured SWL (h/w)	3.8
Total SWL (h/sem)	150		
Delivery Plan (Weekly Syllabus)			
المنهاج الاسبوعي النظري			
	Material Covered	LOs	
Week 1	Vector Analysis Coordinates system Operator	A2 B1 C1	
Week 2	Gradient Operators Divergence Operator Stoke`s theory	A2 B1 C1	
Week 3	Coulomb`s law Electric field Electrostatic potential	A2 B1 C1	
Week 4	point charge Gauss`s law	A2 B1 C1	
Week 5	Dipole expansion Problems	A2 B1 C1	
Week 6	Laplace method	A2 B1 C1	
Week 7	Spherical coordinates Electrostatic images method	A2 B1 C1	
Week 8	Point charge and conducting sphere	A2 B1 C1	
Week 9	Line charge and line images	A2 B1 C1	
Week 10	Electrostatic field in Dielectric Polarization	A2 B1 C1	
Week 11	Problems	A2 B1 C1	
Week 12	Electrostatic Energy	A2 B1 C1	
Week 13	Problems	A2 B1 C1	
Week 14	Electric Current	A2 B1 C1	
Week 15	Magnetic moment	A2 B1 C1	
Week 16	Preparatory week before the final Exam		



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?
Required Texts	Electromagnetic theory M-Reitz النظرية الكهرومغناطيسية / أ.د. حسن الساعدي	Yes
Recommended Texts		
Websites	https://eng.alayen.edu.iq//colleges/e/42	

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.

