MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Magnetism

Module Information معلومات المادة الدراسية					
Module Title	**Magnetism**			**Module Delivery**	
Module Type	**Core**			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MPH12008**				
ECTS Credits	6				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		2nd
Administering Department		Medical Physics	**College**	Science	
Module Leader	Dr. Nihad K. Ali		**e-mail**	nihad@kus.edu.iq	
Module Leader's Acad. Title		Assoc. Prof	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		/ /2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Electricity	**Semester**	1st
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This unit is designed to provide experiences for the student that will lead him/her into an understanding of the similarities and differences among electric, magnetic, and gravitational fields. The inquiry projects used here will support instruction in electrical circuits, gravitational dynamics, and electromagnetic phenomena of all sorts. The students will know how to demonstrate magnetic field and interaction using magnets, and current-carrying wire, show the influence of the magnetic field by a moving charge using a oscilloscope, and demonstrate the electromagnetic induction/ Faraday's law using simple materials
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define the terms: magnetic field, magnetic flux and flux density 2. Explain and draw magnetic field lines associated with current carrying conductors, and explain the principles of instruments based in it; 3. Explain the principles of an oscilloscope; 4. State, explain and use Faraday's law of electromagnetic induction; 5. Derive expression for force on a current-carrying wire in a magnetic field 6. Relate the force (F) to velocity (v), charge (q) and magnetic field (B) 7. How electromotive force induced.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to the magnetic field, Magnetic flux and Calculating the magnetic field. (18 hrs) Motion of charged particles in magnetic fields, The Torque on a Current-Carrying Coil. (12 hrs) Ampere's law. Applications of ampere's law. (15 hrs) Magnetic field of current. Biot- Savart law. (12 hrs) Induced electric field. Lens's law. Inductance. (15 hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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 / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	➢ The magnetic field 1- Magnetism 2- The magnetic field
Week 2	➢ Magnetic field lines Magnetic flux
Week 3	➢ Calculating the magnetic field.
Week 4	➢ Motion of charged particles in magnetic fields
Week 5	➢ The Torque on a Current-Carrying Coil.
Week 6	➢ Ampere's law Applications of ampere's law

Week 7	➢ Magnetic field of current 1- Sources of magnetic field 2- Magnetic field of moving charge.
Week 8	➢ Magnetic field of current element ➢ Biot- Savart law.
Week 9	➢ Magnetic field of a long straight conductor 1- Force between parallel Conductors
Week 10	➢ Magnetic field of circular loop.
Week 11	➢ Induced electromotive force Faraday's law.
Week 12	➢ Induced electric fields Lens's law.
Week 13	➢ Inductance 1- Mutual and self-inductance 2- Energy in an inductor
Week 14	➢ R-L circuit
Week 15	➢ L-C circuit
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: **Hall Effect, and Gauss Meter**
Week 2	Lab 2: **Measurement of the Earth's Magnetic Field**
Week 3	Lab 3: Magnetic Field Induced by a Current-Carrying Wire
Week 4	Lab 4: Biot -Savart Law, the relation between magnetic field and distance.
Week 5	Lab 5: Biot -Savart Law, the relation between current and magnetic field
Week 6	Lab 6: Current Balance
Week 7	Lab 7: The Transformer

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Physics/John D. Cutnell & Kenneth W. Johnson—9th ed.	No
Recommended Texts	Fundamentals of Physics Extended 9th-HQ-Halliday	No
Websites	https://engineeringinterviewquestions.com/electrostatic-electrical-engineering-multiple-choice-questions-and-answers/	

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.