Electricity and Magnetism DESCRIPTION FORM

نموذج وصف الكهربائية والمغناطيسية

Module Information معلومات المادة الدراسية			
Module Title	**Electricity and Magnetism**		**Module Delivery**
Module Type	**Support**		• ☒ **Theory** • ☒ **Lecture** • ☒ **Lab** • ☒ **Tutorial** • ☐ **Practical** • ☒ **Seminar**
Module Code	**UOMU038023**		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		
Module Level	1	**Semester of Delivery**	1
Administering Department	Forensic Science	**College**	College of Science
Module Leader	Dr. Sami abd-alhussein	**e-mail**	Sami.abd.alhussein@uomus.edu.iq
Module Leader's Acad. Title	Asst.Professor	**Module Leader's Qualification**	PH. D
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	E-mail
Scientific Committee	10/11/2023	**Version Number**	1.0

Approval Date			

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 **أهداف المادة الدراسية**	1. To develop problem solving skills and understanding of electricity physics through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. Understanding the main rules in static electricity and the laws that govern it. 4. Learning how to deal with the electrical devices safely. 5. Learning how to use the electrical measuring devices in determining the electrical parameters for materials.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	1. Definition of electricity, the laws related to it, as well as the electric fields accompanying charged particles, methods of derivation for calculating electric field strength, electric potential and current identification 2. Resistors and their types and areas of use and applications. 3. Definition of electric current and how to connect electrical circuits and calculate unknowns in them. 4. Describe electrical power, charge, and current.

	5. Define Ohm's law. 6. Identify the basic circuit elements and their applications. 7. Discuss the various properties of resistors, capacitors, and inductors.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Electricity Physics:</u> DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. [30 hrs] Revision problem classes. [6 hrs] Experimental hours. [30hrs] Electronic classes [6 hrs] Assignments [10 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**	63	**Structured SWL (h/w)**	4

		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	62	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	4
Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	125		

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, 6 and 7
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6
	Projects / Lab.	2	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 6 and 7
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	Unit one/ Coulomb's Law and electric fields
Week 2	Solving problems on unit1
Week 3	Unit Two/ Potential and capacitance
Week 4	Solving problems on unit2
Week 5	Unit Three /Current, resistance and Ohm's law
Week 6	Solving problems on unit3
Week 7	Mid-term exam
Week 8	Unit Four/ Electrical Power
Week 9	Solving problems on unit4
Week 10	Unit 5/ Equivalent resistance
Week 11	Solving problems on unit5
Week 12	Unit 6/ Kirchhoff's law
Week 13	Solving problems on unit6
Week 14	Unit 7/ Forces on magnetic fields
Week 15	Solving problems on unit7
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Ohm's law
Week 2	Lab 2: Parallel and series resistors
Week 3	Lab 3: Ohmic and non-Ohmic resistors
Week 4	Lab 4: Parallel and series capacitors
Week 5	Lab 5: Frequency Response of RC Circuits
Week 6	Lab 6: Frequency Response of RLC Circuits
Week 7	Lab 7: Frequency filters

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**

Required Texts	. Schaums Outline of College Physics by Frederick J. Bueche, Eugene Hecht, Frederick Bueche 1997.	Yes
Recommended Texts	Electricity and magnetism by Kyle, Kirkland 2007	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	