Module Information

معلومات المادة الدراسية

Module Title	**Medical Equipment**	**Module Delivery**	
Module Type	Core	☒ Theory	
Module Code	BME-317	☒ Lecture	
ECTS Credits	6	☒ Lab	
SWL (hr/sem)	150	☐ Tutorial	
		☐ Practical	
		☐ Seminar	

Module Level	UGIII	**Semester of Delivery**	Five
Administering Department	BME.	**College**	ENG.
Module Leader	Dr. Hayder A. Yousif	**e-mail**	hayderyousif@uowa.edu.iq
Module Leader's Acad. Title	Doctor	**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	01/10/2025	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The goal of this one-semester course is to provide the students by a broad overview on " Medical Equipment" with focus on theory, working principle, generations and Medical Applications for the main equipments like X- ray , MRI , CTS and Dental chair. Also training the students in the laboratory to be familiar with most of equipment parts
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Explain the main components of each medical equipment and haw can match these components to produce a good picture that can help the doctors and patient in successful diagnosis and therapy .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Theory This section constitutes the lecture notes to provide undergraduate students of biomedical engineering, X ray theory, terms and components. Also the electrical part and the imaging part . the same section with CTS & MRI Part B - Laboratory. This section to enhance knowledge that started in the theory part, in order to help students to improve these equipments.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: 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	6	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4	
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
	Assignment	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Medical equipments
Week 2	X-Ray Equipment, X-ray definition and theory
Week 3	X-Ray Equipment, X-ray production,
Week 4	Design of X-ray tube, X-ray power supplies and circuits, Heat loading
Week 5	X-ray imaging part cassette . film and filters
Week 6	characteristics of X-ray tube,
Week 7	1st Mid-Exam

Week 8	X-ray control unit, X-ray switches and timing model
Week 9	method for exposure control unit
Week 10	Development of X-ray films (automatic and manual), X-ray fluoroscope machine
Week 11	ypical faults and maintenance of the X-ray,
Week 12	X-ray Computed Tomography scan (CTS),
Week 13	CTS generations, resolution, faults, risks and applications
Week 14	MRI equipments theory, main types, applications and improvement methods
Week 15	Tooth Chair, Tooth chair, main parts and operation, Pneumatic circuits, Hydraulic circuits, Typical faults and maintenance of Tooth chair.
Week 16	2nd Mid - Exam - **Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to X -ray components
Week 2	Lab 2:x- ray electrical generator and circuits
Week 3	Lab 3: x-ray imaging part
Week 4	Lab 4: CTS parts and gantry
Week 5	Lab 5: MRI coils and display part
Week 6	Lab 6: Dental Chair parts
Week 7	Lab 7: medical equipment hazards and safty

<table>
<tr><td colspan="3" align="center">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td align="center">Text</td><td align="center">Available in the Library?</td></tr>
<tr><td>Required Texts</td><td>MEDICAL PHYSICS by John R. Cameron & James G. Skofronick</td><td></td></tr>
<tr><td>Recommended Texts</td><td>ESSENTIAL GUIDE TOMEDCAL EQUIPMENT PRINCIPLES by David Mulvey</td><td></td></tr>
<tr><td>Recommended Websites</td><td>https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</td><td></td></tr>
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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.