

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electromagnetic Fields		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOMU0204053		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader		e-mail	mustafa.falah@mtu.edu.iq
Module Leader's Acad. Title	Asst. Lec.	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name	M.sc Osamah jabber gaiab	e-mail	<a href="mailto:sadik.gharghan@mtu.edu.iq">sadik.gharghan@mtu.edu.iq</a>
Scientific Committee Approval Date	26/10/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering Mathematics		Semester
Co-requisites module	None		Semester

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	1. To learn about electromagnetic transmission 2. To learn about Maxwell's equations 3. To know the types of electromagnetic wave transmission media. 4. To recognize the types of signals and systems. 5. To recognize the Guided Waves 6. To recognize transmission lines 7. To recognize Electromagnetic Radiation and Antennas
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	1. Learn about General review in electrostatic. 2. Learn about Gauss's law. 3. Learn about Steady magnetic field. 4. Learn about Time varying magnetic field. 5. Learn about Maxwell's equations in electric fields. 6. Learn about Maxwell's equations in magnetic fields. 7. Recognize types of electromagnetic wave transmission media. 8. Recognize the types of signals and systems for electromagnetic waves. 9. Recognize the introduction Guided Waves. 10. Recognize the applications Guided Waves in medical device. 11. Recognize transmission lines. 12. Recognize Electromagnetic Radiation and Antennas.
<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following: 1- Electrostatic, Electric charge, Coulomb's law, Electrical field intensity, and examples <b>[4 H]</b> . 2- Electric Flux Density and Gauss's Law with examples <b>[4 H]</b> . 3- Steady Magnetic Field, Magnetic Field in life's human with examples <b>[4 H]</b> . 4- Time varying - magnetic field and Maxwell's equations, FARADAY'S LAW, Moving Conductor in a Magnetic Field, Displacement Current and Conduction Current (Ampere's Law), Maxwell's equations in pointing form, Wave equations with examples <b>[12 H]</b> . 5- Uniform plane wave, Wave velocity, Characteristic impedance, Wave propagation in media, Skin effect, The pointing vector and power consideration with examples <b>[8 H]</b> . 6- Guided Waves with examples <b>[12 H]</b> . 7- Transmission lines with examples <b>[8 H]</b> . 8- Electromagnetic Radiation and Antennas with examples <b>[12 H]</b> .

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	Lectures - means of clarification - intellectual questions - scientific exhibitions - scientific competitions
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## Student Workload (SWL)

الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل		125	

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10 %(10)	3,5,7,9,11,13	LO # 1, 2 LO # 3, 4 LO # 5, 6 LO # 7, 8 LO # 9, 10 LO # 11, 12
	Assignments	2	10 %(10)	5,13	LO # 3-6, and 6-9
	Projects / Lab.	10	15 %(10)	Continuous	
	Report	1	5 %(10)	14	LO # 1-12
Summative assessment	Midterm Exam	2hr	10 %(10)	7	LO # 1-7
	Final Exam	4hr	50 %(50)	16	ALL
<b>Total assessment</b>			100 % (100)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	General review in electrostatic
<b>Week 2</b>	Gauss's law
<b>Week 3</b>	Steady magnetic field
<b>Week 4</b>	Time varying magnetic field
<b>Week 5-6</b>	Maxwell's equations
<b>Week 7</b>	Midterm exam
<b>Week 8</b>	Plane Wave Propagation and Reflection
<b>Week 9-11</b>	Guided Waves
<b>Week 12-13</b>	Transmission lines
<b>Week 14-15</b>	Electromagnetic Radiation and Antennas Preparing for final exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	General review in electrostatic
<b>Week 2</b>	Gauss's law
<b>Week 3</b>	Steady magnetic field
<b>Week 4</b>	Time varying magnetic field
<b>Week 5-6</b>	Maxwell's equations
<b>Week 7-8</b>	Plane Wave Propagation and Reflection
<b>Week 8-10</b>	Guided Waves
<b>Week 11-12</b>	Transmission lines
<b>Week 13-14</b>	Electromagnetic Radiation and Antennas

<b>Learning and Teaching Resources</b> <b>مصادر التعلم والتدریس</b>		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Engineering Electromagnetic (fifth edition – by William H. Hayt. JR)	NO
<b>Recommended Texts</b>	Introduction to Communication Systems (second edition- by Ferrel. G. Stremler)	YES
<b>Websites</b>	<ol style="list-style-type: none"> <li>1. <a href="https://www.coursera.org/search?query=Electromagnetic%20Fields&amp;=&amp;index=prod_all_launched_products_term_optimization">https://www.coursera.org/search?query=Electromagnetic%20Fields&amp;=&amp;index=prod_all_launched_products_term_optimization</a>.</li> <li>2. <a href="http://www.tallguide.com">www.tallguide.com</a></li> <li>3. <a href="http://www.ainfoinc.com">www.ainfoinc.com</a></li> <li>4. <a href="http://www.millitech.com">www.millitech.com</a></li> <li>5. <a href="http://www.rfcafe.com">www.rfcafe.com</a></li> <li>6. <a href="http://www.globalspec.com">www.globalspec.com</a></li> </ol>	

<b>Grading Scheme</b> <b>مخطط الدرجات</b>				
<b>Group</b>	<b>Grade</b>	التقدير	<b>Marks (%)</b>	<b>Definition</b>
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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.