

# 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	Dr. Osamah Jaber Ghayyib	e-mail	osamah.jaber.ghayyib@uomus.edu.iq
Module Leader's Acad. Title	Asst. Lec.	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Osamah Jaber Ghayyib	e-mail	osamah.jaber.ghayyib@uomus.edu.iq
Scientific Committee Approval Date	06/3/2026	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering Mathematics	Semester	UGII-S3
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	<ol style="list-style-type: none"><li>1. To learn about electromagnetic transmission</li><li>2. To learn about Maxwell's equations</li><li>3. To know the types of electromagnetic wave transmission media.</li><li>4. To recognize the types of signals and systems.</li><li>5. To recognize the Guided Waves</li><li>6. To recognize transmission lines</li><li>7. To recognize Electromagnetic Radiation and Antennas</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Learn about General review in electrostatic.</li><li>2. Learn about Gauss's law.</li><li>3. Learn about Steady magnetic field.</li><li>4. Learn about Time varying magnetic field.</li><li>5. Learn about Maxwell's equations in electric fields.</li><li>6. Learn about Maxwell's equations in magnetic fields.</li><li>7. Recognize types of electromagnetic wave transmission media.</li><li>8. Recognize the types of signals and systems for electromagnetic waves.</li><li>9. Recognize the introduction Guided Waves.</li><li>10. Recognize the applications Guided Waves in medical device.</li><li>11. Recognize transmission lines.</li><li>12. Recognize Electromagnetic Radiation and Antennas.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following:</p> <ol style="list-style-type: none"><li>1- Electrostatic, Electric charge, Coulomb's law, Electrical field intensity, and examples [4 H].</li><li>2- Electric Flux Density and Gauss's Law with examples [4 H].</li><li>3- Steady Magnetic Field, Magnetic Field in life's human with examples [4 H].</li><li>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 [12 H].</li><li>5- Uniform plane wave, Wave velocity, Characteristic impedance, Wave propagation in media, Skin effect, The pointing vector and power consideration with examples [8 H].</li><li>6- Guided Waves with examples [12 H].</li><li>7- Transmission lines with examples [8 H].</li><li>8- Electromagnetic Radiation and Antennas with examples [12 H].</li></ol>

## 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 أسبوعياً	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 أسبوعياً	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
<b>Formative assessment</b>	<b>Quizzes</b>	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
	<b>Assignments</b>	2	10 %(10)	5,13	LO # 3-6, and 6-9
	<b>Projects / Lab.</b>	10	15 %(10)	Continuous	
	<b>Report</b>	1	5 %(10)	14	LO # 1-12
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10 %(10)	7	LO # 1-7
	<b>Final Exam</b>	4hr	50 %(50)	16	ALL
<b>Total assessment</b>			100 % (100)		

<b>Delivery Plan (Weekly Syllabus)</b> 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

<b>Delivery Plan (Weekly Lab. Syllabus)</b> 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

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering Electromagnetic (fifth edition – by William H. Hayt. JR)	NO
Recommended Texts	Introduction to Communication Systems (second edition- by Ferrel. G. Stremler)	YES
Websites	1. <a href="https://www.coursera.org/search?query=Electromagnetic%20Fields&amp;=null&amp;index=prod_all_launched_products_term_optimization">https://www.coursera.org/search?query=Electromagnetic%20Fields&amp;=null&amp;index=prod_all_launched_products_term_optimization</a> . 2. <a href="http://www.tallguide.com">www.tallguide.com</a> 3. <a href="http://www.ainfoinc.com">www.ainfoinc.com</a> 4. <a href="http://www.millitech.com">www.millitech.com</a> 5. <a href="http://www.rfcafe.com">www.rfcafe.com</a> 6. <a href="http://www.globalspec.com">www.globalspec.com</a>	

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
<b>Note:</b> 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.				