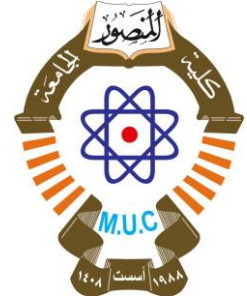




Ministry of Higher Education and
Scientific Research - Iraq
Al-Mansour University College
Department of Communication Engineering



MODULE DESCRIPTION FORM

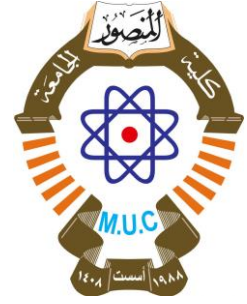
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Applied Mathematics I		Module Delivery
Module Type	Core		
Module Code	COM 23102		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII	Semester of Delivery	
Administering Department	BSc - COMM	College	Al-Mansour University College
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	Version Number	1.0

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



Ministry of Higher Education and
Scientific Research - Iraq
Al-Mansour University College
Department of Communication Engineering



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. Help students appreciate the use of mathematics as a form of communication;2. Help students acquire a range of mathematical techniques and skills and to foster and maintain the awareness of the importance of accuracy;3. Make Mathematics relevant to the interests and experiences of students by helping them to recognize Applied Mathematics in their environment;4. Help students to develop positive attitudes, such as open-mindedness, self-reliance, persistence and a spirit of enquiry;5. Prepare students for the use of Mathematics in further studies;6. Help students to develop an appreciation of the wide application of Mathematics and its influence in the development and advancement of civilization;7. Help students become increasingly aware of the unifying structure of Mathematics.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Upon successful completion of this course, a student will be able to:</p> <ol style="list-style-type: none">1. Enabling student to know the coordinate systems and its types and properties.2. Enabling student to know how to perform basic vector operations such as addition, scalar multiplication, dot and cross product of vectors, and understand subspaces and basis in the vector space R^n, orthogonal complement and projection.3. Enabling student to know the concepts of partial derivative and how can deal with the high order of derivatives.4. Enabling student to know the introduction of differential equations5. Enabling student to know how to use Laplace transform to convert the domain from time to S-domain.6. Enabling student to know how to use Z transform to convert the domain from time to Z-domain in the signal processing
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p> <ol style="list-style-type: none">1. Coordinate systems (9 hrs)2. Vector geometry (9 hrs)



Ministry of Higher Education and
Scientific Research - Iraq
Al-Mansour University College
Department of Communication Engineering



	<p>3. Partial derivatives (6 hrs) 4. Laplace transform and its inverse (6 hrs) 5. Z-transform and its inverse (6 hrs)</p>
<p>Description</p>	<p>Coordinates systems: Cartesian Coordinates, Cylindrical coordinates, Polar Coordinates; Graphing in Polar Coordinates; Polar Equations of Lines, Circles, and Cardioids. Conic Sections and Quadratic Equations: circles, parabola, ellipse, and hyperbola. Three-Dimensional Coordinate Systems. Vectors and the Geometry of Space: addition, subtraction, and scalar multiplication; Dot Product: orthogonal vectors, and vector projection; Properties of product. Cross Product: area of parallelogram, test of parallelism, triple product; Equations of Lines and Planes in Space; Distance between a Point and a Line; Distance between a point and a Plane; Angle between Planes and Lines of Intersection of Planes; Product of three or more vectors. Partial derivatives: Function of two or more variables, The Chain Rule, Directional derivative, Gradient, divergence and Curl, Tangent plane and normal line and Maxima, minima & saddle point. Laplace transform and inverse Laplace transform: definitions, properties and applications, Z-Transform and inverse Z-transform: Introduction, Properties of Z-Transform, Z- transform of elementary functions, Linearity properties, Some standard in Z-Transform, Inverse Z-Transform, Method for finding Inverse Z-Transform, Application of Z-Transform to difference equations</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<ul style="list-style-type: none"> • The module will be delivered using a combination of lectures, tutorials, and directed and independent learning. • The learning and teaching approach will include the introduction of theoretical basis in the lecture form and the application aspects will be further studied throughout the tutorial sessions, including problem solving. In direct learning, you will be instructed to prepare for the lectures including reading the notes, finding and analyzing relevant information in advance. • Working group (2-3 students per group) will be formed to encourage you to engage critical discussion in class. • Case studies will be used to demonstrate and reinforce the lectures and labs. • Solving examples, problems will give experience to understand the complex cases in communication field.
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Ministry of Higher Education and
Scientific Research - Iraq
Al-Mansour University College
Department of Communication Engineering



Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	2	5% (10)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	5% (10)	2 and 13	LO #3 to #6
	Projects / Lab.				
	Homework	2	10% (20)	13	LO #3, #4 and #6
	Midterm Exam	1hr	10% (10)	10	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		



Ministry of Higher Education and
Scientific Research - Iraq
Al-Mansour University College
Department of Communication Engineering



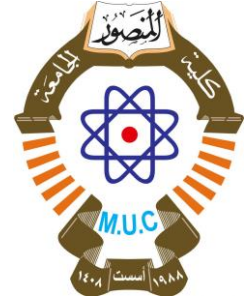
Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered	
Week 1		
Week 2		
Week 3		
Week 4		
Week 5		
Week 6		
Week 7		
Week 8		
Week 9		
Week 10		
Week 11		Mid Exam
Week 12		
Week 13		
Week 14		
Week 15		Preparatory week before the final exam



Ministry of Higher Education and
Scientific Research - Iraq
Al-Mansour University College
Department of Communication Engineering



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> Text Book ☐ Peter V. O'Neil, "Advanced Engineering Mathematics", Cengage Learning, 2012 	Yes



Ministry of Higher Education and
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Al-Mansour University College
Department of Communication Engineering



Recommended Texts	Supplementary Books	Yes
	<ul style="list-style-type: none"> W.E. Boyce, "Elementary differential equations and boundary value problems", Wiley, 2010. Erwin Kreyszig, "Advanced Engineering Mathematics," 10th edition, Wiley, 2011. D.G. Zill, "Advanced Engineering Mathematics," 5th ed., Jones & Bartlett Learning, 2014. Gilbert Strang, "Differential Equations and Linear Algebra," Wellesley-Cambridge Press 	
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
	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
	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.