

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Mathematics III		Module Delivery	
Module Type	Basic Learning Activity		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	MATH212			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGI	Semester of Delivery		Two
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Azhar Malik		e-mail	Azhar.m.alnaseri@uotechnology.edu.iq
Module Leader's Acad. Title	Senior Lecturer	Module Leader's Qualification	M.Sc.	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	1/4/2026	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MATH212	Semester	One
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Helping the student to possess knowledge of engineering mathematics. 2. Possessing problem-solving skills. 3. Develop the ability to deduce, generalize, and use their own logic. 4. Ability to analyze and interpret data.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Solving linear system equations through matrices by Gaussian and Cramer's role methods. 2. Finding Inverse matrices by using Gaussian and cofactor. 3. Finding Eigen values and Eigen vectors. 4. Dealing with periodic function to write Fourier series. 5. Understanding even and odd functions. 6. Understanding the type, order and degree for the ordinary differential equations . and solve the 1st ODE. 7. Finding roots and solving (2nd ODE, higher ODE.)
Indicative Contents المحتويات الإرشادية	<u>Part A – Matrices.</u> Focuses on matrices, inverse matrices using Gaussian and cofactor method, solving linear system equations by using Gaussian and Cramer's role methods and Find Eigen values and Eigen vectors. [10 hrs] Revision problem tutorial sessions [5 hrs] <u>Part B – Fourier Series.</u> Using Fourier series for signal analysis, understanding odd and even Fourier series. [8 hrs] Revision problem tutorial sessions [4 hrs] <u>Part C – Ordinary Differential Equations.</u> Solving ordinary differential equations (1st, 2nd, and higher ODE) and finding roots for higher D.E. [12 hrs] Revision problem tutorial sessions [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The primary approach for presenting this module will be encouraging students to participate in the activities, as well as enhancing and improving their critical thinking abilities. This will be accomplished through lectures, tutorials, debates, and assessing activities.
-------------------	---

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
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)	2 and 4	LO #1 - #4 and #5 - #7
	Assignments	2	10% (10)	5 and 9	LO #1 - #5 and #6 - #7
	Homework	2	10% (10)	10 and 11	LO #1 - #7
	Report	1	10% (10)	13	LO #1 - #7
Summative assessment	Midterm Exam	2hr	10% (10)	8	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	Types of matrices, Matrix addition.
Week 2	Matrix multiplication and Determinants.
Week 3	Solving a system of linear equations by Gaussian method. and Gramer method.
Week 4	Solving a system of linear equations by Cramer's role method.
Week 5	Finding inverse matrices by Gaussian method.
Week 6	Finding inverse matrices by cofactor method.
Week 7	Finding Eigen values and vectors.
Week 8	Definition of periodic function.
Week 9	Write Fourier series for periodic functions.
Week 10	Write odd and even Fourier series for periodic functions.
Week 11	The type, order and degree for the ordinary differential equations.
Week 12	Solve the 1 st ODE (Separable, homo)
Week 13	Solve the 1 st ODE (linear and exact)
Week 14	Solve the 2 nd (homo and nonhomo).
Week 15	Solve the higher ODE (homo and nonhomo).
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Tutorial)

المنهاج الاسبوعي للدرس التدريبي

	Material Covered
	Each week a questions sheet will be solved and discussed related to the material covered in the theoretical lecture.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Joel R. Hass, Christopher E. Heil, Maurice D. Weir, "Thomas' Calculus: Early Transcendentals", Pearson Education, 14th Edition, (January 1, 2017), ISBN-13 : 978-0134439020. Advanced Mathematics for Engineering studies (أزرياض احمد عزت)	Yes
Recommended Texts	Anthony Croft, Robert Davison, "Mathematics for Engineers: A Modern Interactive Approach", Prentice Hall, 3rd edition, (January 1, 2008), ISBN-13 : 978-0132051569.	No
Websites	https://www.khanacademy.org/math/integral-calculus/ic-integration	

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.