



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية



Module Information				
معلومات المادة الدراسية				
Module Title	Engineering Mathematics		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MATH210			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	1	Semester of Delivery	1	
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Kazim A.kazim		e-mail	Kazim.abdulhassan@alayen.edu.iq
Module Leader's Acad. Title	Asst. lecturer		Module Leader's Qualification	Ms.C.
Module Tutor	Kazim A.kazim		e-mail	Kazim.abdulhassan@alayen.edu.iq
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	4/12/2024		Version Number	1.0

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The student will study mathematical theories and application. On completion of this course the student will be able to: 1. Evaluate integrals that require certain techniques 2. Identify some kinds of series and do algebraic manipulations 3. Test the series for convergence 4. Find the inverse of a matrix and use matrices to solve simultaneously linear equations
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand few kinds of techniques of integrations 2. Understand improper integrals and the transformation $z=\tan(x/2)$ 3. Understand Infinite Sequences and Series 4. Understand method used to test the Series 5. Understand the inverse of matrix and how to solve simultaneously linear equations
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Techniques of integrations</u> Using Basic Integration Formulas, Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions, Integration of Rational Functions by Partial Fractions, Improper Integrals. [25 hrs] <u>Part B - Infinite Sequences and Series</u> Sequences, Infinite Series, The Integral Test, Comparison Tests, Absolute Convergence; The Ratio and Root Tests, Alternating Series and Conditional Convergence, Power Series, Taylor and Maclaurin Series, Convergence of Taylor Series. [25 hrs] <u>Part C - Matrices</u> -Determinant of a Matrix-Inverse Of a matrix (operations on rows), Inverse Of a matrix (by minors, cofactors, Adj), Cramer rule. Singular matrices. [10 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Quizzes.
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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	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.13
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% (5)	3, 12	LO #1,2,3,4,and 5
	Online Assignments	10	10% (1)	1,2,4,5,6,7,8, 10,11,13	All
	On site Assignments	2	10% (5)		
	Seminars	2	10% (5)		
Summative assessment	Midterm Exam	3 hr	10% (10)	9, 15	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Techniques of Integration -Using Basic Integration Formulas -Integration by Parts
Week 2	-Trigonometric Integrals

	Trigonometric Substitutions
Week 3	-Integration of Rational Functions by Partial Fractions -Improper Integrals
Week 4	Integration using the transformation $z=\tan(x/2)$
Week 5	Infinite Sequences and Series -Sequences -Examples
Week 6	-Infinite Series -Examples
Week 7	-The Integral Test -Examples
Week 8	- Comparison Tests -Examples
Week 9	MID EXAM -Absolute Convergence; The Ratio and Root Tests -Examples
Week 10	-Alternating Series and Conditional Convergence -Examples
Week 11	-Power Series -Examples
Week 12	- Taylor and Maclaurin Series -Examples
Week 13	Matrices-Introduction
Week 14	-Determinant of a matrix -Inverse of a matrix (operations on rows) -Inverse of a matrix (by minors, cofactors, Adj.)

Week 15	Cramer rule and singular matrix MID EXAM
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas' calculus : early Transcendentals	Yes
Recommended Texts		No
Websites	Microsoft Math soft MathCad Autograph	

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.