



MODULE DESCRIPTION FORM

Module Information			
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 H/Sem.		
Module Level	2	Semester of Delivery	3
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Hasnaa M. El-Arwash	e-mail	Hasnaa.Mohammad@alayen.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Hasnaa M. El-Arwash	e-mail	Hazem.Ali.Jasim@alayen.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	4/12/2024	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. The student will study mathematical theories and application. On completion of this course the student will be able to: 2. Evaluate integrals that require certain techniques 3. Identify some kinds of series and do algebraic manipulations 4. Test the series for convergence 5. Find the inverse of a matrix and use matrices to solve simultaneously linear equations
Module Learning Outcomes	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	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] 1.		
Learning and Teaching Strategies			
Strategies	• Presentations • Discussions • Tutorial and graphics • Problem solving • Brain storming • Research and reporting • Problem Solving • Report & discussion assessment		
Student Workload (SWL)			
Structured SWL (h/sem)	78	Structured SWL (h/w)	8
Unstructured SWL (h/sem)	47	Unstructured SWL (h/w)	3.13
Total SWL (h/sem)	125		
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
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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		
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	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	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.