

MODULE DESCRIPTION FORM

Module Information			
Module Title	Mathematics 2		Module Delivery
Module Type	B		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE123		
ECTS Credits	5		
SWL (hr/sem)	125 H/Sem.		
Module Level	1	Semester of Delivery	2
Administering Department	Artificial Intelligence	College	College of Engineering
Module Leader	Rasha Ahmad Atfah	e-mail	Rasha.atfah@alayen.edu.iq
Module Leader's Acad. Title	Asst. Lec.	Module Leader's Qualification	MSc
Module Tutor	Rasha Ahmad Atfah	e-mail	Rasha.atfah@alayen.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
Prerequisite module	Mathematics 1	Semester	1
Co-requisites module	Linear Algebra	Semester	3

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. Introduce students to some basics of mathematics, which contribute to understanding some of the theories Based on solutions to some engineering problems 2. Solving some engineering problems using basic mathematics theories The ability to find solutions to problems through mathematical methods and drawing



٢٠١ - د. محمد فوزيا

Module Learning Outcomes	Knowledge	A2	A2.1 Define the concept of indefinite and definite integrals and their mathematical properties. A2.2 Describe the different methods of integration used to evaluate integrals. A2.3 Explain the geometric meaning of the definite integral and its relation to area. A2.4 Describe the concepts of triple integrals and coordinate transformations including cylindrical and spherical coordinates. A2.5 Apply appropriate integration techniques to evaluate indefinite and definite integrals. A2.6 Calculate areas and volumes using definite integrals. A2.7 Solve problems involving triple integrals in Cartesian coordinates. A2.8 Apply cylindrical and spherical coordinate systems to evaluate triple integrals and determine volumes of three-dimensional bodies.
		B1	B1.1: Function efficiently as an individual. B1.2: Function as a member of multidisciplinary and multicultural teams.
		C1	C1.1: Define professional and ethical responsibilities. C1.2: Demonstrate diversity in their commitment to ethical responsibilities.
Indicative Contents	Indicative content includes the following. • Introduction to Indefinite Integrals and basic integration concepts (4hrs) • Methods of Integration (basic integration rules and techniques) (4hrs) • Advanced Integration Techniques (4hrs) • Introduction to Definite Integrals (4hrs) • Geometric Interpretation of Definite Integrals (area under curves) (4hrs) • Applications of Definite Integrals in geometry (4hrs) • Introduction to Triple Integrals (4hrs) • Triple Integrals in Cartesian Coordinates (4hrs) • Triple Integrals in Cylindrical Coordinates (4hrs) • Triple Integrals in Spherical Coordinates (4hrs) • Engineering applications (4hrs) • Applications of Triple Integrals (Volumes of Three-Dimensional Bodies) and Review (4hrs)		



	Applications (4hrs)
Learning and Teaching Strategies	
Strategies	- Lectures - Interactive Learning - Simulation and Digital Tools - Group Projects and Presentations - Self-Learning and Assignments
Student Workload (SWL)	
Structured SWL (h/sem)	78
Unstructured SWL (h/sem)	47
Total SWL (h/sem)	125

Delivery Plan (Weekly Syllabus)		
المناهج الاسبوعي النظري		
	Material Covered	LOs
Week 1	Introduction to Indefinite Integrals and basic integration concepts	A2, B1
Week 2	Methods of Integration (basic integration rules and techniques)	A2, B1
Week 3	Advanced Integration Techniques	A2, B1
Week 4	Introduction to Definite Integrals	A2,B1
Week 5	Engineering applications	A2,B1
Week 6	Methods for Evaluating Definite Integrals	,A2,B1
Week 7	Mid exam	A2, B1
Week 8	Geometric Interpretation of Definite Integrals (area under curves)	A2
Week 9	Applications of Definite Integrals in geometry	A2,B1,C1
Week 10	Introduction to Triple Integrals	A2,B1
Week 11	Triple Integrals in Cartesian Coordinates	,A2,B1
Week 12	Triple Integrals in Cylindrical Coordinates	,A2,B1
Week 13	Triple Integrals in Spherical Coordinates	A2,B1

Week 14	Applications	A2,B1,C1
Week 15	Preparation for final exam	A2,B1,C1
Week 16	Final exam	All

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	



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	A2
	Assignments	6	20% (20)	2, 4,6,8,10 and 12	A2
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	13	A2
Summative assessment	Midterm Exam	1	10% (10)	8	A2
	Final Exam	1	50% (50)	16	A2
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Advanced Engineering Mathematics- Erwin Kreyszig 2. Engineering Mathematics-- K.A. Stroud	Yes
Recommended Texts	1- Calculus- James Stewart	NO
Websites	https://eng.alayen.edu.iq//colleges/e/42	



Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جداً	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.

