



**Model Unit Description
Subject Description Form**

**Faculty of Engineering / Department
of Biomedical**



Module Information

Module Title	Mathematics II		Module Delivery		
Module Type	Basic learning		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENG-103				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		1	Semester of Delivery		1
Administering Department			College	Engineering College	
Module Leader	Assist. Lec: Sarah Hashim Mohammed		e-mail	sarah.ha@uowa.edu.iq	
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name		Name	e-mail		
Scientific Committee Approval Date		2/1/2026	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 Aims	The aims of a mathematics module are to provide students with an understanding of mathematical concepts, skills, and techniques that can be applied to a range of real-world problems. This includes topics such as An introductory class in the theory and techniques of differentiation and integration of algebraic and trigonometric functions. Additionally, the module aims to prepare students for future academic and professional pursuits that require mathematical proficiency.
Module Learning Outcomes	Learning Outcomes 1 (Knowledge) An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics. Learning Outcomes 6 (Skills) An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge
Indicative Contents	The Indicative Contents of a Mathematics module will depend on the level and scope of the course. However, some common topics that may be covered in a mathematics module include: - Arithmetic: Basic mathematical operations such as addition, subtraction, multiplication, and division. - Algebra: The study of mathematical symbols and the rules for manipulating these symbols to solve equations and represent real-world situations. - Geometry: The study of shapes, sizes, positions, and measurements of objects in space. - Calculus: The study of mathematical concepts such as limits, derivatives, and integrals. Overall, the Indicative Contents of a Mathematics module aims to provide students with a comprehensive understanding of mathematical concepts and their applications in various fields of study.
Learning and Teaching Strategies	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the

	students.
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Student Workload (SWL)			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Functions: Domain and Range, Functions and their graphs, Trigonometric Functions.
Week 2	Limits and Continuity: Limit of a Function and Limit Laws, One-Sided Limits Continuity, Limits Involving Infinity, Asymptotes of Graphs.
Week 3	
Week 4	Derivatives: Tangent Lines and the Derivative at a Point, The Derivative as a Function, Differentiation Rules, Derivatives of Trigonometric Functions, The Chain Rule, Implicit Differentiation, Linearization and Differentials.
Week 5	
Week 6	
Week 7	Applications of Derivatives: Extreme Values of Functions, The Mean Value Theorem, Monotonic Functions and the First Derivative Test, Concavity and Curve Sketching, Applied Optimization, Antiderivatives
Week 8	
Week 9	
Week 10	Integrals: The Definite Integral, The Fundamental Theorem of Calculus, Indefinite Integrals and the Substitution Method, Definite Integral Substitutions and the Area Between Curves.
Week 11	
Week 12	
Week 13	Applications of Definite Integrals: Volumes using Cross-Sections, Volumes using Washer and Cylindrical Shells methods, Arc Length, Areas of Surfaces of Revolution, Work and Fluid Forces, Moments and Centers of Mass.
Week 14	
Week 15	
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	George B. Thomas Jr., "CALCULUS", 14 th Ed	Yes
Recommended Texts	1. Erwin Kreyszig, "Advanced Engineering Mathematics", 10 th Ed. 2. Schaum's Outline of College Mathematics, Fourth Edition. 3. Mary Attenborough, "Mathematics for Electrical Engineering and Computing", 1 st Ed.	No
Websites	Topics in Calculus -Wolfram Mathworld.	

Grading Scheme مخطط الدرجات			
Group	Grade	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	(45-49)	More work required but credit awarded
	F – Fail	(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.			



Head of the Department
Dr. Osama Abdulbari



أ.م.د. حسين هادي حسين
عميد كلية الهندسة



Sahra Hashim