



Unit Description Form

Course Description Form

Faculty of Engineering / Department of Biomedicine



Unit Information				
Course Information				
Unit Title	Mathematics III		Unit delivery	
Unit Type	Basic		☒ نظريه ☒ حاضر ☐ المختبر ☐ تعليمي ☐ عملي ☐ Seminar	
Unit Code	ENG201			
ECTS Credits	6			
SWL (ساعة / SEM)	150			
Unit level	2	Delivery Semester		
Administrative Management	Biomedical Engineering	College	Faculty of Engineering	
Unit Commander	Salwan Ali Habeeb		E-mail Address	Salwan.ali@uowa.edu.iq
Title of Unit Commander	teacher		Unit Commander Qualifications	Doctor
Unit Teacher			E-mail Address	
Peer Reviewer Name			E-mail Address	
Date of accreditation of the Scientific Committee	26/9/2024		Version number	1.0

Relationship with other units Relationship with other subjects			
Prerequisites Unit	Mathematics II	Semester	2
Common Requirements Unit	No	Semester	

Unit objectives, learning outcomes and how-to contents Course objectives, learning outcomes and instructional contents	
Objectives of the Unit Course Objectives	The objectives of the Mathematics Unit aim to develop a deep understanding of basic mathematical concepts and their practical applications. Emphasis is placed on enhancing students' analytical and logical thinking skills through problem solving and the use of appropriate mathematical methods. The module also aims to teach students how to represent and analyze data using mathematical tools such as graphs and equations. The unit also seeks to develop the ability to apply mathematical concepts in multiple fields such as engineering, physics, and economics, helping to connect mathematics to everyday life and other sciences. In addition, students are encouraged to use modern technologies such as mathematical software to facilitate mathematical calculations and modeling, enhancing their academic and professional competence.

Unit Learning Outcomes Learning outcomes of the course	1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics. 2. An ability to apply engineering design process to produce solutions that meet specified needs with consideration of public health, safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline. 3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw a conclusion.
Indicative Contents Indicative Contents	The instructional contents of the Mathematics module include a set of basic topics aimed at building a solid base of mathematical concepts. The module begins by reviewing basic principles of algebra, such as arithmetic, equations, and inequities, with a focus on solving linear and quadratic equations. The module also includes the study of basic geometry, including geometric shapes, measurements, and geometric theories such as the Pythagorean theorem, as well as the applications of geometry in solving practical problems. The basics of calculus, including derivatives and integrals and their applications in the study of variations and their rates, are discussed. Contents include the study of statistics and probability, where students are taught how to collect, analyze, and represent data using graphs and tables. Emphasis is also placed on solving problems using mathematical models and digital technologies such as custom software. The module concludes with practical applications that link mathematical concepts to everyday life and specialized fields such as physics, economics, and engineering, enhancing students' understanding of the role of mathematics in explaining phenomena and solving real-world challenges.

Learning and Teaching Strategies Learning and Teaching Strategies	
Strategies	The teaching strategy in the Mathematics module is based on combining theoretical explanation with practical application to ensure a deep understanding of the concepts. Real-life examples are used and linked to life problems to illustrate the importance of mathematics and its applications. It also encourages interactive activities such as teamwork and problem solving, as well as the use of technology such as digital tools and mathematical software to enhance learning. Lessons conclude with periodic reviews and tests to assess students' comprehension of content.

Student Workload (SWL) The student's academic load is calculated for 15 weeks			
Structured SWL (h / sem) Regular academic load of the student during the semester	78	SWL regulator (h / w) Regular student load per week	6
Unstructured SWL (h / sem) Irregular academic load of the student during the semester	72	Unregulated SWL (h/w) Irregular student academic load per week	4
Total SWL (h / sem) The student's total academic load during the semester	150		

Unit Evaluation Course Evaluation					
As		Time/Number	Weight (tags)	Week due	Related learning outcomes
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 /Laboratory.				

	Attendends	1	10% (10)	13	LO #5 , 8 and 10
Final Assessment	Midterm Exam	2 hr	20% (10)	5,12	LO #1-5,#6-11
	Final Exam	3 hours	50% (50)	16	All
Overall Rating			100% (100 degree)		

Delivery Plan (Weekly Syllabus) Theoretical Weekly Curriculum	
week	Covered Material
Week 1 Week 2 Week 3 Week 4	Ordinary Differential Equations: First order(variables separable,homogeneous, linear). Second order(Homogeneous and non-homogeneous). Higher order differential equations.
Week 5 Week 6 Week 7	Partial Differentiation: Function of two or more variables, Partial Derivative.
Week 8 Week 9 Week 10	Laplace Transform: Unit step function, Definition of L.T. and properties. Inverse Laplace Transform, Partial Fractions,solution of differential equations using Laplace transform.
Week 11 Week 12	Sequences and Series: Sequences, Series, Geometric series, etc.
Week 13 Week 14 Week 15	Fourier Series: Periodic Function, Fourier series, Even and Odd Function, Complex notation for Fourier series.
Week 16	Preparatory week before the final Exam.

Learning and Teaching Resources		
	text	Available in the library?
Required texts	Erwin Kreyszig,"Advanced Engineering Mathematics", 10 Ed.	Yes
Recommended texts	1. George B. Thomas Jr.,"CALCULAS",14 th Ed. 2. Schaum's Outline of College Mathematics, 4 th Ed. 3. Mary Attenborough, "Mathematics for Elicteical Engineering and Computing", 1 st Ed.	Yes
Websites	Topics in Calculus - Wolfarm Mathworld.	

Grading chart				
group	degree	Appreciation	Tags (%)	definition
Success Group (50 - 100)	A - Excellent	privilege	90 - 100	Outstanding Performance
	B - Very Good	Very good	80 - 89	Above average with some errors
	C - Good	Good	70 - 79	Proper work with noticeable errors
	D - Satisfactory	medium	60 - 69	Fair but with significant shortcomings
	E - sufficient	Acceptable	50 - 59	The work meets the minimum standards
Group failure (0 - 49)	FX - Failed	Deposit (in processing)	(45-49)	More work required but credit granted
	F - Failed	Failure	(0-44)	Large amount of work required

Note: Signs that are more than 0.5 decimal places greater than or below the full mark will be rounded higher or lower (for example, a score of 54.5 will be rounded to 55, while a mark of 54.4 will be rounded to 54. The university has a policy of not tolerating "imminent traffic failure", so the only modification to the marks granted by the original mark(s) will be the automatic rounding described above.



رئيس القسم / م.د أسامة عبد الباري



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



م.م سلوان