Unit Description Form

Course Description Form

Unit Information Course Information				
Unit Title	Mathematics II			Unit delivery
Unit Type	Basic Learning			☒ Theory ☒ Roger that ☐ Lab ☒ Tutorial ☐ practical ☐ Seminar
Unit Code	ENG102			
ECTS Credits	6			
SWL (Hour /SEM)	051			
Unit level	4	Delivery Semester	2	
Administrative Management	Biomedical	College	Engineering Faculty	
Unit Commander	Eng. Hassan Allawi Sabbar	E-mail Address	Hassan.as@uowa.edu.iq	
Title of Unit Commander	Assistant Lecturer	Unit Commander Qualifications	Master	
Unit Teacher		E-mail Address		
Peer Reviewer Name	name	E-mail Address	E-mail Address	
Date of accreditation of the Scientific Committee	1/6/2023	Version number	1.0	

Relationship with other units Relationship with other subjects			
Prerequisites Unit	Mathematics I	Semester	1
Common Requirements Unit	Any	Semester	

Unit objectives, learning outcomes and how-to contents Course objectives, learning outcomes and instructional contents	
Objectives of the Unit Course Objectives	The Mathematics module aims to provide students with an understanding of mathematical concepts, skills and techniques that can be applied to a range of real-world problems. This course aims to introduce the concepts of calculus, complex numbers, vectors and linear algebra. In addition, the module aims to prepare students for future academic and career endeavors that require athletic competence.
Unit Learning Outcomes Learning outcomes of the course	By the end of this module, the student should be able to: 1. Use asymptotic, first and second derivatives to plot graph functions. 2. Apply advanced integration rules/techniques to calculate integrals. Drawing graphs of functions; rounding jobs. 3. Description of the polar coordinate system. 4. Convert from rectangular to polar coordinates. 5. Apply matrix techniques and elementary theory to the problem in geometry. 6. Solve the systems of linear equations and find the inverse of the matrix. 7. Perform the basic algebra of vectors. 8. Evaluate the dot product and vector of two vectors. 9. Evaluate the gradient and spacing and curling of different numerical and vector fields. 10. Complex numbers: algebra of complex numbers, solution of complex polynomial equations, Argand diagrams, polar form of complex numbers, exponential form of complex numbers, sequential expansion of trigonometric and exponential functions, de Moivre's theorem.
Indicative Contents Indicative Contents	The instructional contents of the Mathematics module depend on the level and scope of the course. However, some common topics that can be covered in the Mathematics module include: 1. Arithmetic: Basic arithmetic operations such as addition, subtraction, multiplication, and division. 2. Algebra: the study of mathematical symbols and the rules for manipulating these symbols to solve equations and represent real-world situations. 3. Geometry: The study of shapes, volumes, positions and measurements of objects in space. 4. Calculus: The study of mathematical concepts such as limits, derivatives, and integrals. In general, the instructional contents of the Mathematics module are intended to provide students with a comprehensive understanding of mathematical concepts and their applications in various fields of study.

Learning and Teaching Strategies 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 improving and expanding their critical thinking skills. This will be achieved through interactive classrooms and tutorials and consideration of the kind of simple experiments involving some sampling activities of interest to students.

Student Workload (SWL) Student Load			
SWL regulator (h/sem) Regular academic load of the student during the semester	78	**SWL regulator(h/s)** Regular student load per week	6
Unregulated SWL (h/sem) Irregular academic load of the student during the semester	72	**Unregulated SWL (h/s)** 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	**Contests**	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.	1	10% (10)	continuous	
	report	1	10% (10)	13	LO #5 , 8 and 10
Final Assessment	**Midterm Exam**	2 hours	10% (10)	7	LO #1-7
	Final Exam	3hr	50% (50)	16	every
	Overall Rating		100% (100 degree)		

Delivery Plan (Weekly Curriculum) Theoretical Weekly Curriculum	
week	Covered Material
Week 1 Week 2 Week 3	**Transcendental functions:** inverse functions and their derivatives, natural logarithms, exponential functions, indefinite forms and L'Hôpital rule, inverse trigonometric functions, hyperbolic functions and their inverse.
Week 4 Week 5	**Integration techniques:** integration by parts, trigonometric integrals, trigonometric alternatives, partial fractions, incorrect integrals.
Week 6	**Polar coordinates:** Polar coordinate system, graphing polar coordinate equations, areas and lengths in polar coordinates
Week 7 Week 8 Week 9	**Matrices and determinants**: definitions, properties and operations, determinant, matrix inverse, solving equations of linear system, eigenvalues and eigenvectors**.**
week 10 week 11 week 12	**Vector theory:** three-dimensional coordinate systems, vector representation in space, unit vectors, scalar product, vector product, lines and planes in space, vector function.
Week 13 Week 14 Week 15	**Complex numbers:** complex numbers and operations, solving quadratic equations, Argand diagram, polar form of a complex number, Demoivre's theorem.
Week 16	Preparatory week before the final exam

Learning and Teaching Resources Learning and Teaching Resources		
	text	Available in the library?
Required texts	George B. Thomas Jr., "Calculus," 14th Ed	Yes
Recommended texts	1. Erwin Kreszig, "Advanced Engineering Mathematics", tenth edition. 2. Shum Chart of University Mathematics, fourth edition. 3. Mary Attenborough, "Mathematics for Electrical and Computing Engineering", 1st Ed.	No
Websites	Topics in Calculus - Wolfram Mathworld.	

Grading chart				Grading chart
group	**degree**	Appreciation	**Tags (%)**	**definition**
An-Najah 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.