Ministry of Higher Education and Scientific Research
Supervision and Scientific Evaluation Authority
Department of Quality Assurance and Academic Accreditation

Academic Program Description Form for Colleges and Institutes
Academic Year

University: Shatt Al-Arab
College/Institute: Engineering
Scientific Department: Civil
Date of Form Completion: 01/09/2024

Signature
Name of Head of Department:

Asst. Lecturer Nabeel Najm Abdullah

Signature

Name of Scientific Assistant: Dr. Jawad Kadhim

Reviewed by:
Quality Assurance and University Performance Division
Name of Division Director: Dr. Jasem Mohsen Yasser

Signature:

الدكتور
جاسم محسن ياسر
Dr.Jasim Al-Battat

جامعة شط العرب
كلية الهندسة
العمادة
SHATT AL-ARAB UNIVERSITY

أ.م.د. احسان قاسم محمد
عميد كلية الهندسة

Dean's Approval

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics 2**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**E112**				
ECTS Credits	8				
SWL (hr/sem)	120				
Module Level		1	**Semester of Delivery**		1,2
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Nabil najm		**e-mail**		
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor	Shahid Mohammed		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/09/2024	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الاخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Aims أهداف المادة الدراسية	• Good understanding of General Mathematics. • To give information about Integrations and derivations and how they are used in the physics field. • Helping students to connect mathematics with physics. • solving mathematical examples in their physics modules. • better understanding of integration and derivations and their importance of them in physics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After successful completion of the module, students should be able to: • Work with functions represented in various ways: graphical, numerical, analytical, or verbal. They should understand the connections among these representations. The functions include linear, polynomial, absolute value, rational, exponential, logarithmic, trigonometric, inverse trigonometric, hyperbolic, inverse hyperbolic, and piecewise defined functions. • Define and apply the concepts of limits and continuity to the mentioned functions and study them graphically and analytically. • Understand the meaning of the derivative in terms of a rate of change and local linear approximation, and should be able to use derivatives to solve a variety of problems. • Understand the meaning of the definite integral both as a limit of Riemann sums as the net accumulation of change and should be able to use integrals to solve a variety of problems. • Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus. • Use various integration techniques to obtain anti-derivatives without an integral table or calculator.
Indicative Contents المحتويات الارشادية	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Different forms of teaching will be used to come across with objectives of the course. PowerPoint presentations for the head titles, definitions, graphs, and many useful illustrations with a summary at the end of each chapter will be presented and discussed. • The PowerPoint contains information about new topics and unsolved examples, and then the whiteboard will be used to solve them and to let students to see the solutions.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	142	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	108	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	250		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)		
	Assignments	2	10% (10)		
	Projects / Lab.	1	10% (10)		
	Report	1	10% (10)		
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Complex numbersComplex number systems, Argand diagram.
Week 2	Addition, subtraction, multiplication, division, powers, and roots, De Moivre's theorem
Week 3	Hyperbolic functions: definition, derivatives
Week 4	Hyperbolic functions: Integrals, inverse hyperbolic functions.
Week 5	Plane Analytical Geometry: Circle, Parabola
Week 6	Plane Analytical Geometry: Ellipse, Hyperbola
Week 7	Magnitude of the rotation result: Disc method

Week 8	**Volume of the rotation: The method of cylindrical shells**
Week 9	**Surface area resulting from rotation: The method of cylindrical shells**
Week 10	**Methods of Integration: Integration by Substitution**
Week 11	**Methods of Integration: Trigonometric Integrals and Quadratic Functions**
Week 12	**Methods of integration: integration by parts, integration by partial fractions**
Week 13	**Integration methods: integration of rational functions, improper integrals**
Week 14	**Matrices and Determinants: Definition, Properties of Matrices, Operations on Matrices**
Week 15	**Matrices and determinants: determinants, the inverse of a matrix, solving simultaneous linear equations (Cramer's rule).**
Week 16	**Preparatory week before the final Exam**

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	1. Calculus with Analytical Geometry, Fourth Edition, By Robert Ellis and Denny Gulick, 1990. 2. Calculus, Fifth Edition, By Stanley I. Cross may1992. 3. Calculus, International Edition, By Thomas, 2005.	Yes

Recommended Texts	1. Calculus, 11th Edition, By Thomas, 2013. 2. Understanding Basic Calculus, by S.K. Chung, 2007	Yes
Websites		

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 (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.