

MODULE DESCRIPTION

وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics/I		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	PE114		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	Petroleum Engineering	College	Collage of Engineering
Module Leader	Hadi Mostafa Altalab	e-mail	hadimustafa1997@gmail.com
Module Leader's Acad. Title	Asst. Lect.	Module Leader's Qualification	M.Sc.
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	
Scientific Committee Approval Date	9/09/2025	Version Number	1.0

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



Module Aims, Learning Outcomes and Indicative Contents															
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية															
Module Objectives أهداف المادة الدراسية	1. Introduce definition of the functions and find domain, co-domain for it then sketched it. 2. Define limit and use it to find continuity. 3. Introduce concept of logarithm and relation with natural logarithm. 4. Introduce rules of differentiations and its application.														
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<table> <tr> <td rowspan="2">Knowledge</td><td>A2</td><td> A2.1 understanding the basics of mathematics theories, methods and techniques. It also intends to introduce the applications of petroleum engineering field applications. A2.2 Solving equations, finding solutions to algebraic and differential equations. A2.3 Classification of geometric shapes, as well as functions whether they are linear, quadratic, or exponential, trigonometric functions, and linear, differential, and algebraic equations. </td></tr> <tr> <td></td><td></td></tr> <tr> <td rowspan="2">Skills</td><td>B1</td><td> B1.1 Function efficiently as an individual B1.2 Function as a member of multidisciplinary and multicultural teams </td></tr> <tr> <td>B2</td><td> B2.1 Communicate effectively – graphically with a range of audiences using contemporary tools. B2.2 Communicate verbally and in writing with a range of audiences using contemporary tools. </td></tr> <tr> <td>Ethics</td><td>C2</td><td> C2.1 Recognize professional and ethical responsibility. C2.2 Adhere and respect diversity. </td></tr> </table>	Knowledge	A2	A2.1 understanding the basics of mathematics theories, methods and techniques. It also intends to introduce the applications of petroleum engineering field applications. A2.2 Solving equations, finding solutions to algebraic and differential equations. A2.3 Classification of geometric shapes, as well as functions whether they are linear, quadratic, or exponential, trigonometric functions, and linear, differential, and algebraic equations.			Skills	B1	B1.1 Function efficiently as an individual B1.2 Function as a member of multidisciplinary and multicultural teams	B2	B2.1 Communicate effectively – graphically with a range of audiences using contemporary tools. B2.2 Communicate verbally and in writing with a range of audiences using contemporary tools.	Ethics	C2	C2.1 Recognize professional and ethical responsibility. C2.2 Adhere and respect diversity.	
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Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Unit 1: Introduction and Fundamentals of Functions Introductory concepts to functions, functions and their graphs, combining functions, shifting and scaling of graphs, trigonometric functions, exponential functions, inverse functions, and logarithmic functions. [6 hours] Unit 2: Limits and Continuity Introductory concepts to limits and continuity, limit laws, continuity of functions. [4 hours] Unit 3: Differentiation and its Rules Derivatives, differentiation rules, derivative as rate of change, derivatives of trigonometric functions, chain rule, implicit differentiation, derivatives of inverse														

	functions and logarithms. [6 hours] Unit 4: Applications of Differentiation Derivatives of inverse trigonometric functions, related rates, graphing rational functions, linearization and differentials, extreme values of functions, mean value theorem, monotonic functions and first derivative test. [6 hours] Unit 5: Curve Sketching and Special Differentiation Topics Concavity and curve sketching, indeterminate forms and L'Hôpital's rule. [4 hours]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Presentation • Interactive learning • Discussions • Brainstorming • Group Solving Problems • Problem-Based Learning Self-learning

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية
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		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	1 and 7	A2
	Interaction within the class	All	10% (10)	All	A2
	Assignments	2	10% (10)	4 and 10	A2,B1,C1
	Projects / Lab.				
	Report	1	10% (10)	13	A2
Summative assessment	Midterm Exam	1hr	10% (10)	14	A2,B1
	Final Exam	3hr	50% (50)	15	A2
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)		
المنهاج الاسبوعي النظري		
	Material Covered	LOS
Week 1	Introductory Concepts to Functions.	A2, B1, B2, C1
Week 2	Trigonometric Functions.	A2, B1, B2, C2
Week 3	Exponential Functions.	A2, B1, B2, C1
Week 4	Inverse Functions.	A2, B1, B2, C1
Week 5	Logarithms Functions.	A2, B1, B2, C1
Week 6	Introductory Concepts to limits and Continuity	A2, B1, B2, C1
Week 7	Derivatives.	A2, B1, B2, C1

Week 8	Derivatives of Trigonometric Functions, the Chain Rule	A2, B1, B2, C1
Week 9	Implicit Differentiation.	A2, B1, B2, C1
Week 10	Derivatives of Inverse Functions and Logarithms.	A2, B1, B2, C2
Week 11	Derivatives of Inverse Trigonometric Functions	A2, B1, B2, C1
Week 12	Introduction to Graphing Rational Functions.	A2, B1, B2, C1
Week 13	Applications of Differentiations.	A2, B1, B2, C1
Week 14	Monotonic Functions and the First Derivative Test	A2, B1, B2, C1
Week 15	Concavity and Curve Sketching	A2, B1, B2, C1
Week 16	Preparatory week before the final Exam	A2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Beecher, J. A., Penna, J. A., & Bittinger, M. L. (2007).	No
Recommended Texts	1. "Thomas Calculus" G. Thomas, M. Weir, et al., 13th edition, 2014.	Yes
Websites	https://eng.alayen.edu.iq/colleges/schedules/3	

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.