

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MECT 110		
ECTS Credits	6		
SWL (hr/sem)	180		
Module Level	1	Semester of Delivery	1
Administering Department	Mechatronics	College	Technical Engineering college
Module Leader	Ruqaya Alaa	e-mail	ruqia_alaa_ibrahim@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	MSc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Ruqaya Alaa	e-mail	ruqia_alaa_ibrahim@hilla-unc.edu.iq
Scientific Committee Approval Date	01/06/2023	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 Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of Differential calculus through a broad range of Differentiation techniques. 2. To understand limits and theory of derivative and apply it on various types of functions. 3. This is the basic subject for all engineering fields. 4. Demonstrate basic knowledge and understanding of a core of plane analytical geometry, algebra and applied mathematics. 5. Introduce students to Derivatives of trigonometric functions and their inverses.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recall basic concepts of calculus: functions, variables, limits, and continuity. 2. Use the limit laws to evaluate the limit of a function. 3. Discuss continuity at a point and continuity over an interval. 4. Understand transcendental functions and how a function and its inverse are related. 5. Define Plane analytical geometry and identify how conic sections are formed in addition to define both in words and in algebraic formulae, a circle and its center and radius, and an ellipse and its foci. 6. Learn how to convert rectangular coordinates to polar coordinates and vice versa, as well as plot points using polar coordinates. 7. Differentiate algebraic and transcendental functions Midterm 8. Discuss Chain rules and applications of the derivatives. 9. Define <i>determinants</i> and understand their relation to matrices · Also explain the methodology for finding a <i>determinant</i>. 10. Learn how to solve Linear equations by Cramer's rule.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Limits and Continuity, Trigonometric functions, and their inverses. Hyperbolic and inverse hyperbolic functions, Exponential function and logarithmic function. Plane analytical geometry, parabola & ellipse, hyperbola. [25 hrs] 2. Polar coordinates, Theory and rules of derivatives, Implicit Differentiation and Chain rules, Derivatives of trigonometric functions and their inverses. Derivatives of Transcendental functions and their inverses. [33 hrs] 3. Properties of determinants, Solution of Linear equations by Cramer's rule. [10 hrs] 4. Revision problem classes [5 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. Classes and interactive lessons will be used to achieve this.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	101	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	79	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	180		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (15)	5, 10	LO #1, 2, 7 and 9
	Assignments	4	10% (15)	2, 8	LO # 3, 4, 5 and 6
	Projects / Lab.	0	0	0	
	Report	2	10% (10)	7,14	LO # 5, 6 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المناهج الاسبوعي النظري	
	Material Covered
Week 1	Determinants, properties, Grammar's rule, application of determinant
Week 2	Vectors, vectors in space, unit vector, Scalar product, vector product
Week 3	Trigonometric functions & relation, Graphing of functions, Trigonometric equations
Week 4	Function of limits, Algebraic limit, Trigonometric limit, Infinity as limit
Week 5	Derivative rule, Algebraic & Trigonometric derivative, Chain rule, velocity & acceleration
Week 6	Inverse trigonometric functions & its derivative, Logarithm & Exponential functions & its derivative
Week 7	Hyperbolic functions & its derivative, Inverse hyperbolic functions & its derivative
Week 8	Integration, integrals of trigonometric & inverse functions, Integrals of logarithm & Exponential functions
Week 9	Integrals of logarithm & Exponential functions, Integrals of hyperbolic functions & its derivative, L'Hopital's rules
Week 10	Integration methods; Integration by parts, Integration by partial fraction
Week 11	Integration by trigonometric substitution, Integration of $ax^2 + bx + c$
Week 12	Application of Integration, Area under the curve & between two curves
Week 13	Surface area generated, Length of the curve
Week 14	Volume generated by rotation of curve, Simple differential equations
Week 15	Simpson rule for area, Trapezoidal rule for area, applications
Week 16	Preparatory week before the final Exam

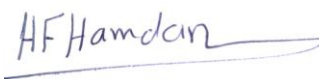
Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering Mathematics I (pdf)	No
Recommended Texts	Thomas ' Calculus (pdf) Fouteenth edition Based on the original work by GEORGE B. THOMAS, JR.	No
Websites	https://elearningatria.files.wordpress.com/2013/10/differential-calculus-1-23.pdf http://dl.konkur.in/post/Book/Paye/Thomas-Calculus-14th-Edition-%5Bkonkur.in%5D.pdf	

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.


د. ه. أ. الكاسبي
عميد

عميد الكلية : أ.د. هارون عبد الكاظم شهد
التاريخ : 2026 / 3 / 26


AF Hamdan

رئيس القسم : أ.د. حسين فاضل حمدان
التاريخ : 2026 / 3 / 26



اسم التدريسي: م.م رقية علاء ابراهيم
التاريخ : 2026 / 3 / 26