	Ministry of Higher Education and Scientific Research - Iraq University of Technology Biomedical Engineering Department	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Calculus**			**Module Delivery**	
Module Type	**M.B**			☒Theory ☒Lecture ☐Lab ☒Tutorial ☐Practical ☐Seminar	
Module Code	**CALC113**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Hussein Jameel Mutashar		**e-mail**	hussein.j.mutashar@uotechnology.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	09/05/2023		**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	In this course, the student will be learn the basic concepts of calculus (differentiation and integration) and basics of matrix in linear algebra , and the skills and method of doing (differentiation and integration), this course also include some applications, specially engineering applications and some biological applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of the module the student is expected to be able to: LO1 Explain the rule of differentiation. LO2 use the derivative in optimization problems LO3 the integration and the methods of integrations with its applications. LO4 basic knowledge of complex analysis and matrices with some applications
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – functions and Differentiation</u> Functions and limts. [8 hrs] Derivative of functions. [8 hrs] Applications of derivative. [4 hrs] optimization. [4 hrs] matrix . [4 hrs] <u>Part B – complex and integrations</u> The define of integral. [4 hrs] Method of integrations. [16 hrs] Applications of integration. [4hrs] Complex numbers. [4 hrs]

Course Description	
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
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 refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of assignments involving some problem solving that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4,8	LO # 1, 2
	Quizzes	2	10% (10)	11,14	LO #3, 4
	Assignments	1	10% (10)	10	LO # 2,3,4
	Assignments	1	10% (10)	15	LO # 1,2,3,4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-4
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Definition of function, Quadratic Formula, Binomial Formula.
Week 2	Straight Line, Conic Sections (Circle, Parabola, Ellipse, Hyperbola).
Week 3	Functions (Trigonometric, Inverse Trigonometric, Logarithmic) Fun.
Week 4	Differentiation (Derivative Definition, Techniques of Derivative, Applications).
Week 5	Differentiation (Derivative of Trigonometric Functions, Chain Rule, Parametric Equations, Implicit Differentiation).
Week 6	Applications of derivatives
Week 7	Matrices (Operations, Determinants, Properties, Grammar's Rule).
Week 8	Integration (Indefinite Integrals & Definite Integrals).
Week 9	Methods of integration (integral forms).
Week 10	Methods of integration (By algebraic substitutions).
Week 11	Methods of integration (By part).
Week 12	Methods of integration (By trigonometric substitutions).
Week 13	Methods of integration (By partial fractions, integral tables).
Week 14	Application of integration, area and volume
Week 15	Complex Numbers & Applications.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Calculus, Thomas or Engineering Mathematics, John Bird**	Yes
Required Texts	**BIOCALCULUS CALCULUS FOR LIFE SCIENCES 1ST EDITION C2015**	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.