MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Calculus-3			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENG008				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	UGII		**Semester of Delivery**	3	
Administering Department	CV101		**College**	Civil Engineering College	
Module Leader	Dr. Jalil Eyada Kwad		**e-mail**	j.j.kwad@uoanabr.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CE1201–Calculus-1 CE1202 – Calculus-2	**Semester**	1 and 2
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. Learn the basics of the calculus of functions of two and three variables. 2. Study vectors in three-dimensional space, derivatives, and integrals. 3. Apply these ideas to a wide range of problems like motion in space, optimization, arc length, etc.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Visualize geometry in three-dimensional space; 2. Perform the calculus of scalar functions of several variables and the calculus of vector functions; 3. Do calculus operations on multivariable functions, including partial derivatives, directional derivatives, and multiple integrals; 4. Apply concepts of multivariable calculus to real world problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Chapter one** Rectangular coordinate system in 3-space and vectors [20 hrs] **Chapter Two** Vector-valued function [15 hrs] **Chapter Three** Partial derivatives [15 hrs] **Chapter Four** Double integration [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Calculus-3 course requires effective learning and teaching strategies to ensure students develop a strong understanding of complex concepts and their practical applications. The range of strategies that can enhance the learning experience for students in Calculus-3 course. These strategies include lecture-based teaching, problem-solving assignments, group work and discussions, technology integration, assessments and feedback, continuous learning, and encouraging self-directed learning. By incorporating these strategies, educators can create an engaging and comprehensive learning environment that equips students with the knowledge, skills, and critical thinking abilities necessary for success in the field of Calculus-3.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
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

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3, 6,10,14	LO # 2 and3
	Assignments	2	5% (5)	2, 12	LO # 1
	Projects / Lab.				
	Report	1	5% (5)	13	LO # 2, and 4
Summative assessment	**Midterm Exam**	2 hr	20% (20)	7	LO # 1-4
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Rectangular Coordinate systems in 3-space. Vectors
Week 2	Dot product, projections. Cross product
Week 3	Parametric equations of a line. Planes in 3-space
Week 4	Introduction to vector-valued functions. Calculus of vector-valued functions
Week 5	Change of parameters, Arc Length. Unit Tangent, Normal and Binormal vectors
Week 6	Curvature
Week 7	Quadric Surfaces. Functions of two or more variables
Week 8	Mid-term Exam
Week 9	Limits and continuity. Partial derivatives
Week 10	Differentiability, Local Linearity. The Chain rule

Week 11	Directional derivatives and gradients. Tangent planes and normal vectors
Week 12	Maxima and minima of functions of two variables. Lagrange multipliers
Week 13	Double integrals. Double integrals over non rectangular regions
Week 14	Double integrals in polar coordinates. Triple integrals
Week 15	Double integrals in polar coordinates. Triple integrals
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:
Week 8	Lab 8:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Calculus, 8th edition (2007) by Howard Anton, (John Wiley & Sons, Inc, New York).	Yes
Recommended Texts	Calculus, by H. Anton, I. Bivens, and S. Davis, 8th Edition, 2002, Wiley	Yes
Websites	https://www.uoanbar.edu.iq/Bank-Section.php	

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.