MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Integration Methods**			**Module Delivery**	
Module Type	**BASIC**			☒**Theory** ☒**Lecture** ☐ **Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**COS-102**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		1	**Semester of Delivery**		2
Administering Department		COM	**College**	COS	
Module Leader	Hassan Kadhom I*brahim*		**e-mail**	hassan.kadhom.ibrahim@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		04/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COS -101	**Semester**	1
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. Differentiate algebraic and trigonometric functions using key 2. Find the tangent line to a given graph at a given point
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, students will: 1. Use differentiation rules to differentiate algebraic and transcendental functions. 2. Identify appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems. 3. Evaluate definite integrals using the Fundamental Theorem of Calculus. 4. Demonstrate an understanding of the relationship between derivatives and integrals using the Fundamental Theorem of Calculus.
Indicative Contents المحتويات الإرشادية	• Applications of Differentiation Maximum and minimum, rates of change, differentials, linear approximations, increasing and decreasing functions, curve sketching. • Integration Integrals, techniques of integration, applications of integration. • Ordinary Differential Equations First order equations, second order linear equations with constant coefficients.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Develop an effective and time-efficient **homework/study strategy** for, not only your calculus class, but other classes as well. This will help you become a more confident, successful, and well-rounded student. It will lead to a healthier balance between work time and leisure time. Spend at least **two to four hours** on each homework assignment. This affords you extra time to work on challenging homework problems and helps you organize your thoughts, questions, and ideas. The more time you spend on homework, the more likely you are to articulate clear, concise questions to your classmates and teachers. The more time you spend on homework, the less time you will spend on frantic, last-minute preparation for exams. Definitions, formulas, and theorems that are introduced in class or needed to complete homework assignments should be **memorized immediately** . Postponing this until it's needed for the exam will impede your work speed on homework assignments and interfere with clearer and deeper understanding of calculus. Spend time working on calculus **every day** . Doing some calculus every day makes you more familiar with concepts, definitions, and theorems. This familiarity will make calculus get easier and easier one day at a time. Find at least **one or two other students** from your calculus class with whom you can regularly do homework and prepare for exams. Your classmates are perhaps the least

	used and arguably your best resource. An efficient and effective study group will streamline homework and study time, reduce the need for attendance at office hours, and greatly improve your written and spoken communication. The best time to use your classmates as study/homework partners is after you have made an honest effort on your own to solve the problems using your own wits, knowledge, and experience. When you encounter an unsolvable problem, don't give up too soon on it. Being stumped is an opportunity for mathematical growth and insight, even if you never solve the problem on your own. If you seek help prematurely, you will never know if you could have solved a tough problem without outside assistance. Begin preparing/outlining for exams at least **five class days** before the exam. Outlining the topics, definitions, theorems, equations, etc. that you need to know for the exam will help you focus on those areas where you are least prepared. Preparing early for the exam will build your self-confidence and reduce anxiety on the day of the exam. It's also an insurance policy against time lost to illness, unexpected family visits, and last-minute assignments in other classes. Generally speaking, pulling all-nighters and doing last-minute cramming for exams is a recipe for eventual academic disaster. Prepare for exams by working on **new problems** . Good sources for these problems are unassigned problems from your textbook, review exercises and practice exams at the end of each chapter, old hour exams, or old final exams. Studying exclusively from those problems which you have already been assigned and worked on may not be effective exam preparation. Problems for each topic are generally in the same section of the book, so knowing how to do a problem because you know what section of the book it is in could give you a false sense of security. Working on new randomly mixed problems more closely simulates an exam situation, and requires that you both categorize the problem and then solve it. Use **all** resources of assistance and information which are available to you. These include classnotes, homework solutions, office hours with your professor or teaching assistants, and problem sessions with your classmates. Do not rely exclusively on just one or two of these resources. Using all of them will help you develop a broader, more natural base of knowledge and understanding. Expect your exams to be **challenging** . If they are challenging, you will be prepared. If they are not challenging, you can expect to have an easy time getting a very high score !

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	20% (20)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Differentiation: Introducing the Derivative. The Derivative as a Function. Rules of Differentiation
Week 2	Differentiation: The Product and Quotient Rules. Derivatives of Trigonometric Functions. Derivatives as Rates of Change.
Week 3	Differentiation: The Chain Rule, Implicit Differentiation
Week 4	Differentiation: Derivatives of Inverse Trigonometric Functions. Related Rates.
Week 5	Applications of Derivatives: Maxima and Minima. Mean Value Theorem. What Derivatives Tell Us
Week 6	Applications of Derivatives: Graphing Functions. Optimization Problems
Week 7	Applications of Derivative: Linear Approximation and Differentials. L'Hôpital's Rule
Week 8	Integration: Approximating Areas under Curves. Definite Integrals. Fundamental Theorem of Calculus.
Week 9	Integration: Working with Integrals. Substitution Rule. Part1
Week 10	Integration: Working with Integrals. Substitution Rule. Part2
Week 11	Integration: Working with Integrals. Substitution Rule. Part 3
Week 12	Integration: Regions Between Curves. Volume by Slicing. Volume by Shells. Part1
Week 13	Integration: Regions Between Curves. Volume by Slicing. Volume by Shells. Part2
Week 14	Integration: Length of Curves, Surface Area, Logarithmic and Exponential Functions.

Week 15	Review
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	Edwards, C.H. and Penney, D.E. Elementary Differential Equations. Prentice-Hall. (latest ed.).	Yes
Recommended Texts	Thomas, G. and Finney, R. Calculus and Analytic Geometry. Addison-Wesley. (latest ed.). Adams, R. Single Variable Calculus. Pearson Education. (latest ed.).	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.