Module Information
معلومات المادة الدراسية

Module Title	**Mathematics**	**Module Delivery**	
Module Type	C	☒**Theory** ☒**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☒**L Seminar**	
Module Code	MU010601208		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		
Module Level	1	**Semester of Delivery**	2
Administering Department		**College**	
Module Leader	Basim Akudaer Abbas	**e-mail**	baasim_math@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ms
Module Tutor	Name (if available)	**e-mail**	
Peer Reviewer Name	Hazim Michman Trao	**e-mail**	hazimmichman@uomustansiriyah.edu.iq
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	1
Co-requisites module	None	**Semester**	1

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Demonstrate knowledge of basic precalculus concepts and skills. 2. Work with functions and limits. 3. Recognize continuity and use the properties of continuous function. 4. Solve problems using derivatives. 5. Find derivatives of algebraic and trigonometric functions. 6. Definition and rules of differentiation to differentiate.

	7. Sketch the graph of function using asymptotes. 8. Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. 9. Evaluate integrals using advanced techniques of integration, such as inverse substitution, partial fractions and integration by parts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Concepts of basic functions 2. Interpret equations and graphs of the basic classes of functions 3. Identify trigonometric functions and their features 4. Analyze inverse functions 5. Examine exponential, logarithmic, and hyperbolic functions 6. Determine the existence of estimate numerically and graphically and find algebraically the limits of functions 7. Recognize and determine infinite limits and limits at infinity and interpret with respect to asymptotic behavior. 8. Determine continuity at a point or on intervals and distinguish between the types of discontinuities at a point. Definite and Indefinite Integration 9. Determine the derivative of a function using the limit definition. Interpret the derivative as the slope of a tangent line to a graph, the slope of a graph at a point, and the rate of change of a dependent variable with respect to an independent variable 10. Determine the derivative and higher derivatives of a function explicitly using differentiation formulas. 11. Determine derivatives implicitly. 12. Solve related rates problems. 13. Determine absolute extrema for a continuous function on a closed interval. Use these and other appropriate techniques to solve optimization problems. 14. Use the first and second derivatives to analyze and sketch the graph of a function, including asymptotes, intervals on which the graph is increasing, decreasing, concave up, or concave down, and any local extrema and inflection points. 15. Determine antiderivatives and indefinite integrals and integrate by substitution. 16. Use the Fundamental Theorem of Calculus to evaluate definite integrals. 17. Use definite integrals to find areas of planar regions.
Indicative Contents المحتويات الإرشادية	The basic areas covered: Functions, Continuity, Derivative, and Integrals. • Introduce concepts of Functions, and use the properties of functions as value of function, domain of a function, Graph of a function and operations with Functions. • Learn some **techniques for Computing Limits, Infinite Limits, Limits at Infinity** • Learn how to evaluate the Continuity of function. • Investigate some techniques for Computing Derivatives of trigonometric Functions. • Introduce definition of definite Integral, techniques of integration

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment Strategy This course is designed to further the student's understanding of mathematics, to lead students to connect the mathematics to its application in computer science and to encourage the students to communicate their ideas and their expertise to the professional community. With this in mind, the course grade involves an assessment of their performance on in-class quizzes and exams that focus on the applications of discrete mathematics to computer science. • Weekly assigned homework to motivate students to do the work and earn credit accordingly. • Weekly in-class quizzes • Weekly, in-class presentations by students of solutions to real world problems related to the course material and classroom discussion and critique of the presentation. • Three in-class exams to assess the student's accumulative mastery of content covered prior to time of exam. • A comprehensive final exam to assess the student's accumulative mastery of course material.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
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	62	**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	20% (20)	5 and 10	LO #1- #5 and #10- #14
	Assignments	2	10% (10)	2 and 12	LO #6, #7and #8, #9
	Projects / Lab.				
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #8
	Final Exam	3hr	50% (50)	16	All

Total assessment	100% (100 Marks)		100% (100 Marks)

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Identify Functions; Find the Value of a Function; Find the Domain of a Function; Use operations with Functions
Week 2	Identify the Graph of a Function and use Information about the Graph
Week 3	Identify and use Properties of Functions
Week 4	Graph the Functions in the Library of Functions; Graph Piecewise-defined Functions
Week 5	Quiz
Week 6	Identify the Graph of trigonometric function,
Week 7	**Techniques for Computing Limits, Infinite Limits, Limits at Infinity**
Week 8	Continuity
Week 9	Identify derivative, techniques of differentiation
Week 10	quiz
Week 11	Techniques for Computing Derivatives of trigonometric Functions
Week 12	Theorems, examples to recite on demand all indeterminate forms of a limit (0/0, infinity/infinity, mixed product, indeterminate differences, indeterminate powers
Week 12	Derivatives of Logarithmic
Week 13	Exponential Function
Week 14	Interpretations and Properties of indefinite Integrals
Week 15	definition of definite Integral, techniques of integration
Week 16	**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	1. Calculus: late transcendental. - 7th Edition combined /Howard Anton, Irl Bivens. Stephen Davis. 2. Exercises and Problems in Calculus ,John M. Erdman Portland State University Version August 1, 2013 c 2010 John M. Erdman	Yes
Recommended Texts	Calculus Volume 1 SENIOR CONTRIBUTING AUTHORS EDWIN "JED" HERMAN, UNIVERSITY OF WISCONSIN-STEVENS POINTGILBERT STRANG, MASSACHUSETTS INSTITUTE OF TECHNOLOGY	No
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.