

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Calculus I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code			
ECTS Credits	6		
SWL (hr/sem)	63		
Module Level	1	Semester of Delivery	
Administering Department		College	Type College Code
Module Leader	Rasha Majeed Yaseen	e-mail	rasham@kecbu.uobaghdad.edu.iq
Module Leader's Acad. Title	Lectured	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		Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	Our Main Goal in this module is to review and Develop the course of mathematics and its applications. Since Functions are the major objects we deal with in calculus because they are key to describing the real world in mathematical terms.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. How to Identify the Characteristics of Equations and Sketch their Graphs;</li> <li>2. Find and Graph Equations of Lines Including Parallel and Perpendicular Lines using the concept of slope;</li> <li>3. How to find limits Graphically and Numerically; Evaluate limits analytically;</li> <li>4. Determine One-Sided Limits, Two-Sided Limits and Infinite Limits;</li> <li>5. Find Vertical, Horizontal and Oblique Asymptotes; Determine Continuity at a Point and on an Open Interval;</li> <li>6. Knowledge and Understanding Differentiation which represent One of the Most Important Processes of Calculus;</li> <li>7. Learn new Methods and Rules for Finding Derivatives of Functions Then Apply these Rules to Find Such Things as Velocity, Speed, Acceleration, and the Rates of Change of Two or More related of two or more variables;</li> <li>8. Discuss Several Applications of derivatives of a Function with Three Basic Categories Curve Sketching, Optimization, and Approximation Techniques;</li> <li>9. Knowledge Integration: the Closely Related to Differentiation and Important Process of Calculus;</li> <li>10. Learn New Methods and Rules for Solving Definite and Indefinite Integrals Including the Fundamental Theorem of Calculus, then Apply these Rules to Find such Things as the Position Function for an Object and the Average of a Function;</li> <li>11. Introduce and Define Matrix Which are arrays of real or complex numbers, and have a unique but not exclusive, relationship with systems of linear equations and their solution.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ol style="list-style-type: none"> <li>1 Using the Blackboard and Wide Screen to Introduce the Students to this Module, we also let the students to participate in the problem solving process in the class and by giving them homework;</li> <li>2 Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;</li> <li>3 Personal Videos, Lectures material placed on YouTube or other e-learning environment;</li> <li>4 External Printed lectures or References from industry;</li> <li>5 Obviously, Small group tutorial sessions inside the class make more ideas useful and easier to understand how to solve the Material of this module;</li> <li>6 Question and answer sessions during lectures or staff Office Hours;</li> <li>7 Guided reading of texts, journal articles ... etc., for individual and group projects.</li> </ol>
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### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.5
<b>Total SWL (h/sem)</b> 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	1 (1%)	3,6,10 and 14	1-2, 3-4, 7, 9
	Assignments	1	2(2%)	9	5
	Projects / Lab.				
	Report	1	2(2%)	13	10
Summative assessment	Midterm Exam	2	10 (10 %)	7 and 12	6-8, 9-10
	Final Exam	1	12 (12 %)	15	11
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Real Numbers and the Real Line, Intervals, and Solving Inequalities such as absolute value, greater integer and sigma function.
Week 2	Solving Quadratic and nonlinear Inequalities.
Week 3	Reviews coordinates, lines, distance, circles, and parabola functions. Also the domain, range and their graphs.
Week 4	Summarize number of important types of functions and algebraic Operation on are combined or transformed to form new functions.
Week 5	reviews the basic Trigonometric functions.
Week 6	Limit: definition and calculating it by using it's laws.
Week 7	Infinite limits, Calculating all types of Asymptotes and Continuity.
Week 8	Tangents, Differentiation and it's rules
Week 9	The derivative as a rate of change and Derivatives of Trigonometric functions.
Week 10	Derivative by using the Chain Rule and Parametric Equations.

<b>Week 11</b>	The Implicit differentiation and some of the important applications of derivatives.
<b>Week 12</b>	Reviews integral as Area under the curve and The Fundamental theorem of Calculus
<b>Week 13</b>	Indefinite Integrals and the substitution rule also define area between curves by integral
<b>Week 14</b>	Matrices and determinants: theorems
<b>Week 15</b>	Inverse Matrix and Solve the System of Equations by using Cramer rule.
<b>Week 16</b>	Final Exam.

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Thomas_Calculus_11 <sup>th</sup> Edition	Yes
<b>Recommended Texts</b>	1. Calculus-Courses-Adams 2010 2. Calculus-Edwards2010	No
<b>Websites</b>		

### Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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.