

# MODULE DESCRIPTION FORM

Module Information			
Module Title	Calculus I		Module Delivery
Module Type	Basic		☑ Lecture
Module Code	IT105		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG1	Semester of Delivery	
Administering Department	Information Technology	College	College of Science
Module Leader	Saja Bassem Ali	e-mail	<a href="mailto:Saja.b@uowa.edu.iq">Saja.b@uowa.edu.iq</a>
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	MS.C
Module Tutor	Saja Bassem Ali	e-mail	<a href="mailto:Saja.b@uowa.edu.iq">Saja.b@uowa.edu.iq</a>
Peer Reviewer Name	Asst. Lecturer Nabeel Sadeq	e-mail	<a href="mailto:nabeel.alshreefy@uowa.edu.iq">nabeel.alshreefy@uowa.edu.iq</a>
Scientific Committee Approval Date	2024-12-08	Version Number	1.0

Relation with other Modules			
Prerequisite module	-	Semester	-
Co-requisites module	-	Semester	-

  
 أ.م.د. شياد صبيح نونل  
 ٢٠٢٤/١٢/٠٨

Department Head Approval



  
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Dean of the College Approval

## Module Aims, Learning Outcomes and Indicative Contents

<b>Module Objectives</b>	<ol style="list-style-type: none"> <li>1- Understand the concept of the derivative of a function and its geometrical and mechanical significance.</li> <li>2- Criticize the basic rules of differentiation and be able to apply them to find first and higher derivatives of functions.</li> <li>3- Know the elementary properties of the trigonometric functions, the inverse trigonometric functions, the exponential and logarithmic functions. Be able to differentiate expressions involving these functions.</li> <li>4- Know about critical points of differentiable functions and their use in determining maxima and minima. Be able to apply these ideas in simple problems in optimization.</li> <li>5- State the different methods of integration and their applications.</li> <li>6- Understand the essential mathematics relevant to computer science.</li> <li>7- Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics.</li> </ol>
<b>Module Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1- Handle techniques of differentiation and integration in solving practical problems</li> <li>2- Use of standard numerical recipes and mathematical libraries in problem solving.</li> <li>3- Explore, and where feasible solve, mathematical problems, by selecting appropriate techniques.</li> <li>4- Evaluate systems in terms of general quality attributes and possible tradeoffs presented within the given problem.</li> <li>5- Prove and disprove assertions using a variety of techniques</li> </ol>
<b>Indicative Contents</b>	<ol style="list-style-type: none"> <li>1- Summarize the proposed solutions and their results.</li> <li>2- Verifying solutions.</li> <li>3- Observing results and attitudes.</li> <li>4 - Setting goals towards solving traditional and non-traditional problems.</li> <li>5- Defining problems in precise scientific way.</li> <li>6- Restrict solution methodologies upon their results.</li> <li>7- Identify a range of solutions and critically evaluate and justify proposed design Solutions.</li> <li>8- Criticize the methods of differentiation and integration.</li> </ol>

### Learning and Teaching Strategies

<b>Strategies</b>	<ol style="list-style-type: none"> <li>1- Manage time effectively.</li> <li>2- Present a clear, logical argument.</li> <li>3- Work independently. d4- Solve practical problems in course projects.</li> <li>4- Speeding up the computation of conventional mathematical problems such as sorting, recursion, and matrix multiplication.</li> <li>5- The ability to evaluate systems in terms of general and specific quality attributes.</li> <li>6- Work within and contribute to a team, apply management skills such as coordination, project design and evaluation and decision processes.</li> </ol>
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### Student Workload (SWL)

<b>Structured SWL (h/sem)</b>	45	<b>Structured SWL (h/w)</b>	4
<b>Unstructured SWL (h/sem)</b>	74	<b>Unstructured SWL (h/w)</b>	5
<b>Total SWL (h/sem)</b>	122 + 3 (Final Exam) = 125		

### Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	10% (10)	3,6 and 9	1,2,3,4
	<b>Assignments</b>	2	5% (5)	4, 12	1,2,3,4
	<b>H. W</b>	5	10% (10)	2,4,6,8,10	1,2,3,4
	<b>Attendance</b>	1	10% (10)	Continues	1,2,3,4
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	15% (15)	5,11	
	<b>Final Exam</b>	3hr	50% (50)	16	
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

	Material Covered
<b>Week 1</b>	Numbers and Sets. Representations of Functions.
<b>Week 2</b>	Domain; Codomain; Range of Functions. Test for Even and Odd Functions.
<b>Week 3</b>	Types of Functions and their Graphs.
<b>Week 4</b>	Definition of Limit.
<b>Week 5</b>	Finding Limits Graphically and Numerically
<b>Week 6</b>	Limit Laws
<b>Week 7</b>	One-Sided Limits
<b>Week 8</b>	Infinite Limits
<b>Week 9</b>	Continuity
<b>Week 10</b>	Introduction to Differentiation
<b>Week 11</b>	The Derivative of a Function
<b>Week 12</b>	Differentiability and Continuity
<b>Week 13</b>	basic derivative theorems
<b>Week 14</b>	Implicit Differentiation
<b>Week 15</b>	Applications of Differentiation
<b>Week 16</b>	Preparatory week before the final Exam

## Learning and Teaching Resources

	Text	Available in the Library?
<b>Required Texts</b>	1. Calculus. Thomas. book 2. Calculus I. Paul Dawkins book	Yes
<b>Recommended Texts</b>	Ron Larson and Bruce Edwards 11 Edition	No
<b>Websites</b>	<a href="https://tutorial.math.lamar.edu/Classes/Calcl/Calcl.aspx">https://tutorial.math.lamar.edu/Classes/Calcl/Calcl.aspx</a>	

### Grading Scheme

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