

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Integral Mathematics		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET1204		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	
Administering Department	MITE	College	Al-Safwa University
Module Leader	Aliyaa Maetham Abbas	e-mail	alia.maitham@alsafwa.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Msc
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	15/11/2023	Version Number	2.0

Relation with other Modules				
مع المواد الدراسية الأخرى				
Prerequisite module	Differential Mathematics		Semester	1
Co-requisites module	None		Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To develop problem solving skills and understanding of Integral calculus through a broad range of Integration techniques.</li><li>2. To understand theory and methods of integrations and apply it on various types of functions.</li><li>3. This is the basic subject for all engineering fields</li><li>4. Demonstrate basic knowledge and understanding of a core of linear algebra and applied mathematics.</li><li>5. Introduce student to integration of trigonometric functions and their inverses.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Identify the integration.</li><li>2. Interpret definite and indefinite integrals.</li><li>3. Integrate functions resulting in inverse trigonometric functions.</li><li>4. Integrate functions involving exponential and logarithmic functions.</li><li>5. Learn approximation techniques for integration.</li><li>6. Calculate the areas of curved regions by using integration methods.</li><li>7. Find the volume of a solid of revolution using various integration methods.</li><li>8. Learn how to find the length of a plane curve for a given function.</li><li>9. Teaching students how to calculate the inverses of matrices and how to identify them.</li><li>10. Teaching students how to find the solution of a homogeneous system of linear equations.</li><li>11. Teaching students how to find the eigenvalues of a matrix and the corresponding eigenvectors of a matrix.</li><li>12. Determine the diagonalizability of a given matrix.</li></ol>

<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following.
	Introduction to integration. Methods of integration and Basics of Definite and indefinite Integration, Integration of trigonometric and inverse functions. Integration of the exponential functions, Integration of logarithmic functions. Integration of Hyperbolic and inverse hyperbolic functions, numerical integration and applications of the definite integrals. [30 hrs]
	Area of surface, Volume of revolution, Length of plane curve, Matrices and Inverse of matrix, Matrix Diagonalization Solution of homogeneous systems, Eigenvalues, and Eigenvectors [40 hrs]
	Revision problem classes [3 hrs]

<b>Learning and Teaching Strategies</b> اس تأثيرات التعلم والتعليم	
<b>Strategies</b>	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. Classes and interactive lessons will be used to achieve this.

<b>Student Workload (SWL) الحمل</b> الدرايس للطلاب محسوب ل ١٥ اسبوعا			
<b>Structured SWL</b> الحمل الدرايس المنتظم للطلاب خلال الفصل (h/sem)	78	<b>Structured SWL (h/w)</b> الحمل الدرايس المنتظم للطلاب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدرايس غرت المنتظم للطلاب خلال الفصل	47	<b>Unstructured SWL (h/w)</b> الحمل الدرايس غرت المنتظم للطلاب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدرايس الكلي للطلاب خلال الفصل	125		

<b>Module Evaluation</b> تقييم المادة الدراسية	
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		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 12	LO #1- #4 and #6 - #12
	Online assignments	2	10% (10)	3 and 13	LO #1- #4 and #6 - #12
	Report	1	10% (10)	14	LO #1- #6 and #8 - #11
	OnSite assignment	1	10% (10)	4 and 11	LO #1- #9
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #5
	Final Exam	3hr	50% (50)	16	LO #1- #12
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوع النظري

	Material Covered
Week 1	Introduction to integration.
Week 2	Methods of integration and Basics of Definite and indefinite Integration.
Week 3	Integration of trigonometric and inverse functions.
Week 4	Integration of the exponential functions.
Week 5	Integration of logarithmic functions.
Week 6	Integration of Hyperbolic and inverse hyperbolic functions.
Week 7	<b>Mid-term Exam</b> + numerical integration and applications of the definite integrals.
Week 8	Area of surface.
Week 9	Volume of revolution.
Week 10	Length of plane curve.
Week 11	Matrices and Inverse of matrix.
Week 12	Matrix Diagonalization
Week 13	Solution of homogeneous systems
Week 14	Eigenvalues and Eigenvectors

<b>Week 15</b>	<b>Preparatory week before the final Exam</b>
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<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Notes on Calculus II Integral Calculus Miguel A. Lerma	No
<b>Recommended Texts</b>	Thomas ' Calculus (pdf) Fouteenth edition Based on the original work by GEORGE B. THOMAS, JR.	No
<b>Websites</b>	<a href="https://sites.math.northwestern.edu/~mlerma/courses/math214-2-02f/notes/c2-all.pdf">https://sites.math.northwestern.edu/~mlerma/courses/math214-2-02f/notes/c2-all.pdf</a> <a href="http://dl.konkur.in/post/Book/Paye/Thomas-Calculus-14th-Edition-%5Bkonkur.in%5D.pdf">http://dl.konkur.in/post/Book/Paye/Thomas-Calculus-14th-Edition-%5Bkonkur.in%5D.pdf</a>	

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