	Ministry of Higher Education and Scientific Research - Iraq University of Technology Computer Science Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**Mathematics**		**Module Delivery**	
Module Type	CORE		Theory	
Module Code	**MATH112**		Lecture Lab	
ECTS Credits	**8**		Tutorial Practical	
SWL (hr/sem)	**200**		Seminar	
Module Level	1	**Semester of Delivery**		1
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader	Lect. Sora Ali	**e-mail**	110040@uotechnology.edu.iq	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.	
Module Tutor	Lect. Sora Ali	**e-mail**	110040@uotechnology.edu.iq	
Peer Reviewer Name		**e-mail**		
Review Committee Approval		**Version Number**		

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	NUAN213	**Semester**	3

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To learn how solve and develop problem solving skills
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learning how solve equations by hand without computer. 2. Develop the brain ability.

Indicative Contents
المحتويات الإرشادية
	Indicative content includes the following:
	
	➢ Mathematical background
	➢ Matrix
	  • Types of matrix
	  • Matrix addition, subtraction, and multiplication
	  • Determinant, transpose, symmetric of matrix and rank of matrix
	  • Inverse of matrix, absolute value, and polynomials
	  • Grammar rule for solving system of equation.
	➢ Functions
	  • Function Definition
	  • Domain and range of functions
	  • Graphing of function
	➢ Limits
	  • Definition of limits
	  • Theorems of limits
	  • Type of limits
	  • One side and two sides limits
	  • Limits as infinity
	  • Sandwich theorem and continues functions
	➢ Derivation
	  • Mathematical definition of derivation, rule of derivation
	  • Derivation of trigonometric, inverse trigonometric, logarithm, exponential hyperbolic, inverse of hyperbolic function.
	  • Implicit derivation, chain rule, higher derivation
	➢ Derivation
	  • L'Hôpital rule
	  • Application of derivation, velocity and acceleration
	➢ Series
	➢ Integration
	  • Indefinite integral

	• Rules of integral • Method of integration • Multiple integral • Definite integral • Application of integral area under the curve • Area between two curves

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	5% (5)	5, 10	LO #1 and 2
	Assignments	1	3% (3)	2, 12	LO #1 and 2
	Projects / Lab.				
	Report	1	2%(2)	13	LO #1 and 2
Summative assessment	Midterm Exam	2hr	20% (20)	7	LO #1 and 2
	Final Exam	3hr	70% (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	➢ Mathematical background ➢ Matrix, Types of matrix, Matrix addition, subtraction, and multiplication, Determinant, transpose, and rank of matrix
Week 2	➢ Inverse of matrix, absolute value, and polynomials, Crammer rule for solving system of equations.
Week 3	➢ Functions Definition, Domain and range of function, Graphing of function
Week 4	➢ Limits, Definition of limits, Theorems of limits, Type of limits, One side and two sides limits, Limits as infinity
Week 5	➢ Derivation, Mathematical definition of derivation, rule of derivation, Derivation of trigonometric, inverse trigonometric, logarithm, exponential
Week 6	➢ Series
Week 7	➢ Integration, Indefinite integral, Rules of integral
Week 8	➢ Method of Integration
Week 9	➢ Partial derivatives, partial derivatives of two variables, total differential
Week 10	➢ Differential equations, first order DE, variable separable, homogeneous DE
Week 11	➢ Exact DE, first order linear DE
Week 12	➢ Second order DE, Homogenous second order with constant coefficient, non-homogenous second order with constant coefficient, Variation of parameters
Week 13	➢ Laplace Transform (L.T), Definition, Transformation of function, transform of deferential properties of L.T, shifting, L.T of integrals, multiplication by t^n
Week 14	➢ Inverse Laplace transformation, properties of inverse L.T., partial fraction
Week 15	➢ Application Laplace transformation, Linear (D.E), partial fraction
Week 16	Final Exam

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي العملي

	Material Covered
Week 1	How to use MATLAB Matrix, Types, addition, subtraction, multiplication, determinant, transpose, and rank of a matrix

Week 2	Inverse of a matrix, absolute value
Week 3	Functions, definition, polynomials
Week 4	Derivation, definition, rule of derivation, trigonometric derivatives, inverse trigonometric, logarithm, exponential.
Week 5	Series
Week 6	Integration, Indefinite integration, rules of integral.
Week 7	Methods of integration
Week 8	Partial derivatives of two variables, total deferential
Week 9	Deferential equations, first order D.E., variable separable
Week 10	Homogenous differential equation
Week 11	Exact differential equation, first order linear D.E.
Week 12	Second order D.E. with constant coefficient
Week 13	Non homogenous second order with constant coefficient
Week 14	Laplace Transform
Week 15	**Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Thomas, G. Calculus and Analytic Geometry, Fifth Edition, Addition Wesly,1999**	Yes
Recommended Texts		
Websites	https://youtube.com/@soraali5120	

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required