MODULE DESCRIPTION FORM

Module Information				
Module Title	Mathematics	**Module Delivery**		
Module Type	**Support or related learning activity**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**		
Module Code	**MAT1010**			
ECTS Credits	**7**			
SWL (hr/sem)	**175**			
Module Level	1	**Semester of Delivery**	1	
Administering Department	SSWR1969, PLPR1966, HOLA1974, FORE1964, FOSC1965, FICR1973, ANPR1964, AGEC1979, AETT1979, AGME1986	**College**	AGFO1964	
Module Leader	Alla Mohamed Abdullah Omar Dheyaa Mohammed Asmaa Mohammed Adil Moyassar Mohammed Aziz Nofal Issa Mohamed sumyia khalaf Badawi Firas Kadhim Dawoo Aljuboori Khaled Anwer Khaled ALKHALED Talal Saeed Hameed Muzahim Saeed Al-Bek	**e-mail**	ala.mohammed58@uomosul.edu.iq dr.omaralmallah@uomosul.edu.iq asmaama@uomosul.edu.iq moyassar_aziz@uomosul.edu.iq nofelemh@uomosul.edu.iq dr.sumyia_khalf@uomosul.edu.iq firasaljuboori@uomosul.edu.iq khalid.anwar31@uomosul.edu.iq stalal1982@uomosul.edu.iq` muzahim_saeed@uomosul.edu.iq	
Module Leader's Acad. Title	**Professor** **Assistant Professor**	**Module Leader's Qualification**	Ph.D. M.Sc.	
Module Tutor	Ahmeed Abd ALrahem	**e-mail**	Ahmed79@uomosul.edu.iq	
Peer Reviewer Name		**e-mail**		
Scientific Committee Approval Date	**15/10/2024**	**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	- **-To enable students to acquire proficiency in performing differential calculus operations.** - **In the field of calculus, the fundamental methodologies used to examine and describe functions are limits, derivatives, and integrals.** - **Students will use these tools to address application problems across a wide range of disciplines, including physics, biology, business, and economics.**

Module Learning Outcomes	**LO#1: The student uses understanding and of the basic concepts of engineering mathematics.** **LO#2: The student can develop his mental abilities when solving exercises.** **LO#3: The student can make connections with information mental abilities when solving exercises to reach a solution and benefit from it in other transactions.**
Indicative Contents	**Indicative content includes the following.** **Theory and Tutorial:** **The focus will be on logarithms - the natural logarithm [SSWL=4 hrs], and applications and solutions will be taken for problems in the exponential function - the trigonometric function - trigonometric facts - complex angles [SSWL=4 hrs], and then the focus will be on differential calculus - derivative laws - derivatives from higher orders such as the equation of the straight line (tangent and perpendicular) and the derivative of trigonometric functions and the derivative of exponential functions - derivatives of logarithmic functions with applications on the derivative (velocity and acceleration) and applications on the derivative (points of inflection) and in hours [SSWL=24 hrs], then moving on to integration calculations - integration laws - definite integration and focusing on integration methods - integration by algebraic substitution - integration by parts and integration methods - integration by partial fractions and in hours [SSWL=12 hrs], then the focus will be on important applied aspects such as finding the area under the curve - the approximate method - by integration calculations and finding the area between two curves With applications of volume of a rotating body and numerical integration Trapezoidal rule and number of hours [SSWL=16 hrs].**

Learning and Teaching Strategies	
Strategies	**Quizzes,** **Homework,** **Discussion and solving exercises within the lecture, student interaction**

Student Workload (SWL)			
Structured SWL (h/sem)	**63**	**Structured SWL (h/w)**	**4**
Unstructured SWL (h/sem)	**112**	**Unstructured SWL (h/w)**	**2**
Total SWL (h/sem)	**175**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative	**Quizzes**	**2**	**10% (10)**	**6 and 9**	**LO #1, #2**

assessment	Assignments	2	10% (10)	3 and 10	All
	Tutorial	1	10% (10)	Continuous	All
	Report	1	10% (10)	12	All
Summative assessment	Midterm Exam	2hr	10% (10)	7	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Theory Syllabus)	
	Material Covered
Week 1	Logarithms and natural logarithms
Week 2	The exponential function - the trigonometric function - trigonometric facts compound angles
Week 3	Differential Calculus - Laws of Derivatives - Higher Order Derivatives
Week 4	Equation of a straight line (tangent and normal)
Week 5	Derivative of trigonometric functions
Week 6	Derivative of exponential functions - derivative of logarithmic functions
Week 7	Midterm Exam
Week 8	Applications on the derivative (speed and acceleration)
Week 9	Applications to the derivative (inflection points)
Week 10	Introduction to integration calculations - laws of integration - definite integration
Week 11	Integration methods - integration by algebraic substitution - integration by Part.
Week 12	Integration methods - integration with partial fractions
Week 13	Finding the area under the curve - the approximate method - using integration Calculations
Week 14	Find the area under the curve
Week 15	Volume of solid revolution and Numerical integration
Week 16	Preparatory week before the final Exam
Delivery Plan (Weekly Tutorial Syllabus)	
	Material Covered
Week 1	Solving exercises and mathematical applications in logarithms and natural logarithms
Week 2	Solving exercises and mathematical applications in the exponential function - the trigonometric function - trigonometric facts compound angles
Week 3	Solving exercises and mathematical applications in differential Calculus - Laws of Derivatives - Higher Order Derivatives
Week 4	Solving exercises and mathematical applications in equation of a straight line (tangent and normal)
Week 5	Solving exercises and mathematical applications in derivative of trigonometric functions
Week 6	Solving exercises and mathematical applications in derivative of exponential functions - derivative of logarithmic functions
Week 7	Midterm Exam

Week 8	**Solving exercises and mathematical applications in applications on the derivative (speed and acceleration)**
Week 9	**Solving exercises and mathematical applications in applications to the derivative (inflection points)**
Week 10	**Introduction to integration calculations - laws of integration - definite integration**
Week 11	**Solving exercises and mathematical applications in integration methods - integration by algebraic substitution - integration by Part.**
Week 12	**Solving exercises and mathematical applications in integration methods - integration with partial fractions**
Week 13	**Solving exercises and mathematical applications in finding the area under the curve - the approximate method - using integration Calculations**
Week 14	**Solving exercises and mathematical applications in find the area under the curve**
Week 15	**Solving exercises and mathematical applications in volume of solid revolution and Numerical integration**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	**Mathematics for Machine Learning author M. P. Deisenroth, A. A. Faisal and C. S. Ong**	**No**
Recommended Texts	**Mathematical Handbook of Formulas and Table 1300 Math Formulas**	**No**
Websites	**https://mathblog.com/mathematics-books/**	

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