	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Applied Pathological Analysis Department	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Calculus1			**Module Delivery**	
Module Type	Suplement			☒**Theory** ☒**Lecture** ☐**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	CREQ1201				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Applied Pathological Analysis		**College**	College of Sciences	
Module Leader	Athraa Abdulsalam		**e-mail**	athraa.a.s@nahrainuniv.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Athraa Abdulsalam Ruqaya Saadi		**e-mail**	athraa.a.s@nahrainuniv.edu.iq	
Peer Reviewer Name	Athraa Abdulsalam		**e-mail**	athraa.a.s@nahrainuniv.edu.iq	
Review Committee Approval	24/02/2024		**Version Number**	1	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	The aim of this course is for students to gain proficiency in computations. In calculus, we use two main tools for analyzing and describing the behavior of functions: limits and derivatives. Students will use these tools to solve application problems in a variety of settings ranging from chemistry to Biology.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To determine the solution set of inequalities involving absolute value, 2. To determine the domain, range, and operation of someone's variable functions and the graphs. 3. To determine the limit and continuity of one variable function. 4. To determine the derivation of one variable function. 5. To determine the solution of problems involving the derivation of one variable function. 6. To determine the inverse function and its derivative. 7. To learn about the application of derivatives. 8. To determine the proper integral of one variable function. 9. To determine integral involving the fundamental theorem of Calculus and method of substitution. 10. To determine the solution of problems involving the integral of one variable function. 11. To compute integral involving transcendental functions. 12. To compute integral with advanced integration techniques. 13. To demonstrate the ability to think critically by recognizing patterns and determining and using appropriate techniques for solving a variety of integration problems.		
Indicative Contents المحتويات الإرشادية	1. function and its graph, operation on function, trigonometry function. 2. Definition, theorems of limit, trigonometry function limit, limit on infinity, infinite limit, continuity function, 3. Definition and rule of derivate, a derivate of trigonometry function, chain rule, higher order derivate, implicit derivate, related rate, the basic concept of differential, 5. Natural logarithm function, inverse function and its derivate, natural exponential function, general exponential function, general logarithm function, hyperbolic function and its inverse.		

	6. Proper integral, Fundamental Theorem of Calculus, basic rules of integration. 4- Methods of integration, method of substitution, partial integration method, trigonometry integral, and integral of rational function with partial fraction. 5- Improper integrals, test for convergence and divergence of improper integrals. 6- Application of Definite Integrals, Mean value theorem of integration, Area, solid revolution volume, and Arc length.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will be presented to the students through a specified series of lectures, supported by practice and directed study outside the classroom. Formative assessment takes place throughout the module during lectures and feedback is given during these lectures.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	65	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	35	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	2.667
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation **تقييم المادة الدراسية**				
	Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**

Formative assessment	**Quizzes**	2	10% (10)	3, 8	LO #1, 2, and 3
	Assignments	2	10% (10)	6, 9	LO # 4 and 5
	Report	1	10% (10)	12	LO # 5 and 6
Summative assessment	**Midterm Exam**	2	20% (20)	5,10	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Preliminaries, elementary Functions, and graphing.
Week 2	Exponential growth and decay, Sequences, More population models.
Week 3	Limits, Continuity, Limits at infinity, The Sandwich Theorem and some trigonometric limits, Properties of continuous functions.
Week 4	Formal definition of the derivative, The power rule, the basic rules of differentiation, and the derivatives of polynomials.
Week 5	Midterm Exam.
Week 6	The product and quotient rules, and the derivatives of rational and power functions. The chain rule and higher derivatives. Derivatives of trigonometric functions.
Week 7	Derivatives of exponential functions. Derivatives of inverse and logarithmic functions. Approximations and local linearity
Week 8	Extrema and the Mean Value Theorem. Monotonicity and Concavity.
Week 9	Extrema, inflection points, and graphing. Optimization.
Week 10	L'Hospital's rule.
Week 11	Difference equations: stability.
Week 12	Antiderivatives.
Week 13	The definite integral. The Fundamental Theorem of Calculus.
Week 14	Applications of integration.
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Calculus for Biology and Medicine, fourth edition by Claudia Neuhauser & Marcus Roper.	No
Websites	www.mathhandbook.com	

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

Note:

NB 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي