

	Ministry of Higher Education and Scientific Research - Iraq Al-Naji University College of Engineering Department of Cybersecurity Engineering	
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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	CALCULUS II			Module Delivery	
Module Type	SUPPLEMENT			☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	CE1201				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	UG I	Semester of Delivery	2		
Administering Department	CSE	College	7294		
Module Leader	Hasan Risan		e-mail	hasan.risan@alnaji-uni.edu.iq	
Module Leader's Acad. Title	Assist. Lecturer		Module Leader's Qualification	Msc	
Module Tutor	None		e-mail		
Peer Reviewer Name			e-mail		
Review Committee Approval	01/06/2023		Version Number	1.0	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Calculus I / CALC102	Semester	1
Co-requisites module	None	Semester	None
Module Aims, Learning Outcomes and Indicative Contents			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims	1-To understand complex numbers and basic operation over them. 2-To deal with basic mathematics concepts.		
أهداف المادة الدراسية			

	3-To use learned topics in solving electrical circuit analysis problem. 4-To Develop the knowledge about matrices and basic operation over them. 5-To perform calculation of convergence value of infinite series.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Recognize different forms of complex numbers 2-Perform form conversion of complex numbers 3-Describe systems in terms of equations and then in a matrix 4-Explain how to solve these equations from matrix form 5-List various terms of plane analytic geometry 6-Define the different types of integration methods 7-Introduced the student to the series and teach him how to find the value of if it was convergence.
Indicative Contents المحتويات الإرشادية	A-Complex This part spread over 3 weeks. During which the student will learn how to deal with complex numbers. B-Matrices The next 3 weeks, the student will introduce to the matrices and learn different operation on the matrix to transform it to another one, where this transformation will be used to solve system of equations. C-Geometry Some geometrical curves (shapes) are presented with the standard equation those govern these shapes. D- integration Different types of integration methods to reduce the complexity of direct integration are presented E- Series The last four weeks deals with series and discuss the convergence concept and how to evaluate them
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Weekly lectures and tutorial session to ensure better understanding Quizzes and exams to ensure student learning

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	61	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 8	1,2,3,7
	Assignments	2	10% (10)	10	1-4, 5
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	13	4-7
Summative assessment	Midterm Exam	2 hr	10% (10)	7,14	1-6
	Final Exam	2hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Complex Numbers and Functions I Complex Numbers and Their Geometric Representation, Polar Form, Powers and Roots, Polar coordinates, Graphs of polar equations, Polar equations of conics and other functions, Integrals.
Week 2	Complex Numbers and Functions II Derivative of Complex Function, Exponential Function, Trigonometric and Hyperbolic Functions. Euler's Formula.
Week 3	Complex Numbers and Functions III Line Integral in the Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula
Week 4	Matrices and Linear Transformation I Matrices, Vectors: Addition and Scalar Multiplication, Matrix Multiplication, Symmetric, Skew-Symmetric, and Orthogonal Matrices.
Week 5	Matrices and Linear Transformation II Linear Systems of Equations. Gauss Elimination, Linear Independence. Rank of a Matrix, Vector Space
Week 6	Matrices and Linear Transformation III Solutions of Linear Systems, Existence, Uniqueness, Determinants, Cramer's Rule, Inverse of a Matrix, Gauss-Jordan Elimination
Week 7	Integration Methods I Basic integration formulas, Integration by parts, Products and powers of trigonometric functions, Even powers of sines and cosines.
Week 8	Integration Methods II Trigonometric substitutions in integrals. Integrals involving ax^2+bx+c , Partial fractions, $z=\tan(x/2)$, Improper integrals.
Week 9	Plane Analytic Geometry I Conic sections, Equations from the distance formula, Circles.
Week 10	Plane Analytic Geometry II Parabolas. Ellipses, Hyperbolas. Quadratic curves.
Week 11	Hyperbolic Functions Definitions and identities, Derivatives and integrals, The inverse hyperbolic functions.
Week 12	Sequences and Infinite Series I Sequences of numbers, Limits that arise frequently, Infinite sequences and series.
Week 13	Sequences and Infinite Series II Tests of convergence of series with non-negative terms (integral, comparison, ratio, and root

	tets), Absolute convergence Alternating series. Conditional convergence.
Week 14	Power Series I Power series for functions, Taylors's theorem with remainder, Sines, cosines, and e^x series.
Week 15	Power Series II Further computations, logarithms, arctangent and π , Indeterminate forms, Convergence of power series. Integration, differentiation, Multiplication, and division.
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas and Finney, Calculus and Analytic Geometry, Edition and year public: Pearson Education Inc, 11 th Ed	Yes
Recommended Texts	None	--
Websites	https://mdl.coie-nahrain.edu.iq	

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.

