MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية لمادة الرياضيات

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PE 123**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2nd	
Administering Department	PE		**College**	CE	
Module Leader	**Oday Ibraheem Abdullah**		**e-mail**	**oday.abdullah@alnaji-uni.edu.iq**	
Module Leader's Acad. Title	**Prof.**		**Module Leader's Qualification**	**PHD**	
Module Tutor	Name (if available)		**e-mail**		
Peer Reviewer Name	Name		**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	• Introduce basic definitions of integration and its application and methods of integration. • Calculate the area under curves, volumes, and the arc length. • Learn how to perform the Integration by Parts • Quantify the Trigonometric Integrals • Define matrices and introduce types of matrices. • Help students to evaluate determinants. • Explain an introduction to vectors. • Introduce the basic definitions of complex numbers and their related to the mathematical operations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this module, the student will be able to: 1. Acquire the ability to think logically and factually, and learning how to generalize the concepts of engineering mathematics 2. Learn the main integration methods to solve complicated integral equations. 3. Learn the characteristics of logarithmic and exponential functions and introduce the hyperbolic functions and their inverses. 4. Learn the integration techniques including integration by parts, trigonometric integrals and substitutions. 5. Learn to evaluate the determinants and matrices. 6. Learn the basics of vectors. 7. Learn and recruit complex numbers in the related mathematical models. 8. Learn the applications of integrations. 9. Work in groups and function on multi-disciplinary teams. 10. Understand professional, social and ethical responsibilities.
Indicative Contents المحتويات الإرشادية	Introductory Concepts to Integration Integrals • The Definite Integral • Definite Integral Substitutions and the Area Between Curves • Indefinite Integrals and the Substitution Method Applications of Definite Integrals • Volumes Using Cross-Sections • Volumes Using Cylindrical Shells • Arc Length • Areas of Surfaces of Revolution Integrals and Transcendental Functions • The Logarithm Defined as an Integral • Exponential Change and Separable Differential Equations • Hyperbolic Functions • Relative Rates of Growth Techniques of Integration • Integration by Parts • Trigonometric Integrals • Trigonometric Substitutions

	• Integration of Rational Functions by Partial Fractions • Integral Table and Computer Algebra Systems • Numerical Integration Determinants and Matrices • Introductory Concepts to Determinants • Introductory Concepts to Matrices Vectors • Vectors-The Basics Complex Variables Applications of Integration

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Lectures: during the week, the theoretical lectures will be presented throughout the semester; the discussion of practical work within the lab will be organized and illustrated with activities. • Assignments: after the lectures, the assignment will be explained and given to students. It is expected to be done on a weekly basis. • Quizzes: the contents of each lecture will be discussed during class for open questions and answers to make sure every student will participate and be active. • Practical Discussion: during the practical session, the students will combine as partners and form a group to discuss their class learning and open tutorials on the topics. • In class brainstorming sessions: provide students with enough sources and background knowledge briefly within the topics during class to top up their challenge packs to be more active

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**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	**HomeWorks**	4	10% (10)	3, 6, 10, and 13	All
	Quizzes	3	30% (30)	4, 11 and 14	All
Summative assessment	**Midterm Exam**	1hr	10% (10)	8	LO #1 - #3, #9, and #10
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introductory Concepts to Integration**
Week 2	**Integrals** • The Definite Integral • Definite Integral Substitutions and the Area Between Curves
Week 3	• Indefinite Integrals and the Substitution Method
Week 4	**Applications of Definite Integrals** • Volumes Using Cross-Sections • Volumes Using Cylindrical Shells
Week 5	• Arc Length • Areas of Surfaces of Revolution
Week 6	**Integrals and Transcendental Functions** • The Logarithm Defined as an Integral • Exponential Change and Separable Differential Equations
Week 7	• Hyperbolic Functions • Relative Rates of Growth
Week 8	**Techniques of Integration** • Integration by Parts • Trigonometric Integrals
Week 9	• Trigonometric Substitutions
Week 10	• Integration of Rational Functions by Partial Fractions

Week 11	• Integral Table and Computer Algebra Systems • Numerical Integration
Week 12	**Determinants and Matrices** • Introductory Concepts to Determinants • Introductory Concepts to Matrices
Week 13	**Vectors** • Vectors-The Basics
Week 14	**Complex Variables**
Week 15	**Applications of Integration**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Text and Books	• "Thomas Calculus" G. Thomas, M. Weir, et al., 13th edition, 2014.	Yes
Recommended Texts		
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	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.