Ministry of Higher Education and
Scientific Research – Iraq

University of Warith Al-Anbiyaa
College of Engineering
Aircrafts Engineering Department

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Mathematics III	**Module Delivery**	
Module Type	CORE		
Module Code	ENG231	**Theory**	
ECTS Credits	5	**Tutorial**	
SWL (hr/sem)	125		

Module Level	2	**Semester of Delivery**	3
Administering Department	Aircrafts Engineering	**College**	Engineering
Module Leader	Dr. Aws Akram Al-Akam	**e-mail**	aws@uowa.edu.iq
Module Leader's Acad. Title	Assist. Prof	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Review Committee Approval	01/06/2024	**Version Number**	2024

Relation with Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ENG122	**Semester**	2

Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To provide a course of high academic quality in Mathematics in a challenging and supportive learning environment that encourages students to reach their full potential, personally and academically. 2. To provide a course that is suitable both for students aiming to pursue research and for students going into other careers. 3. To provide an integrated system of teaching which can be tailored to the needs of individual students. 4. To develop in students the capacity for learning and clear logical thinking. 5. To continue to attract and select students of outstanding quality. 6. To provide an intellectually stimulating environment in which students have the opportunity to develop their skills and enthusiasm to their full potential.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Knowledge and Understanding: This Course will develop learners' ability to: 1. Use mathematical models 2. Understand and use mathematical concepts in solving mathematical differential equations kinds. 3. Select and apply skills in dealing with geometric series, power series and Fourier series. 4. Use mathematical reasoning skills to interpret information, select a strategy to solve a problem, and communicate solutions. Subject-specific skills: It is expected that learners will develop the following: 5. Skills for Learning, and drawn from the main skills areas listed below. 6. Skills for Life 7. and Skills for Work These must be built into the Course where there are appropriate opportunities.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Ordinary Linear Differential Equations:** 1st order differential equations, Separable, Homogeneous, Exact, Linear, Bernoulli, 2nd Order Differential Equations, Homogeneous, Non-Homogeneous. [32 hrs] **Sequences and Series:**

Sequence, Series, Geometric Series, Tests of Convergence, Definition, The General Term Test, The Integral Test, The Comparison Test, The Limit Comparison Test, The Ratio Test, The Root Test, Alternating Series, Power Series, Interval of Convergence, Taylor Series, Maclaurin Series, Applications. [24 hrs]

Fourier Series:
Periodic Function, Even and Odd Functions, Half Range Expansion Function. [9 hrs]

Partial Differentiation
Definition, Mechanism of Differentiation, Functions of Two Variables, Functions of Higher Variables. [6 hrs]

General Applications. [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	All lectures reflect the higher values, purposes and principles. They offer flexibility, provide more time for learning, focus on skills and applying to learn, and scope for personalization and choice. In this Course, and its component Units, there will be an emphasis on skills development and the application of those skills. Assessment approaches will be proportionate, fit for purpose and will promote best practices, enabling learners to achieve the highest standards they can. This course provides learners with opportunities to continue to acquire and develop the attributes and capabilities of the four capacities, as well as skills for learning, skills for life and skills for work.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	3,5,9,11	LO #1, 2, 3, and 4
	Assignments	2	10% (10)	6, 12	LO # 5
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	8	LO # 6
Summative assessment	Midterm Exam	2 hrs.	10% (10)	7	LO # 1-4
	Final Exam	3 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	**Ordinary Linear Differential Equations** 1st order differential equations Separable Homogeneous
Week 2	Exact Linear Bernoulli
Week 3	2nd Order Differential Equations Homogeneous
Week 4	Non-Homogeneous
Week 5	Higher Order Differential Equations Homogeneous
Week 6	Non-Homogeneous Applications
Week 7	**Sequences and Series** Sequence Series Geometric Series Tests of Convergence
Week 8	Definition The General Term Test The Integral Test The Comparison Test

Week 9	The Limit Comparison Test The Ratio Test The Root Test
Week 10	Alternating Series Power Series Interval of Convergence
Week 11	Taylor Series Maclaurin Series Applications
Week 12	**Fourier Series** Periodic Function
Week 13	Even and Odd Functions Half Range Expansion Function
Week 14	**Partial Differentiation** Definition Mechanism of Differentiation Functions of Two Variables Functions of Higher Variables
Week 15	**General Applications**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Exp. 1:
Week 2	Exp. 2:
Week 3	Exp. 3:
Week 4	Exp. 4:
Week 5	Exp. 5:
Week 6	Exp. 6:
Week 7	Exp. 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. George B. Thomas, Jr., Maurice D. Weir and Joel Hass, Thomas' calculus, 12th edition, AddisonWesley, 2010. 2. Erwin Kreyszig,"Engineering mathematics", McGRAW-HILL ,9thedition, 2006.	Yes
Recommended Texts		
Websites		

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.