	Ministry of Higher Education and Scientific Research - Iraq Al-Mustaqbal University College of Engineering Department of Prosthetics and Orthotics Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	الرياضياتII			**Module Delivery**	
Module Type	BASIC			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOMU0103021				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	2	
Administering Department	UOMU0103		**College**	UOMU01	
Module Leader	Firas Thair Al-maliky		**e-mail**	firas.thair.almaliky@uomus.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	PhD.	
Module Tutor					
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	Mathematics I	**Semester**	Two
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 understand the basic concepts of Sequences and Series. 2. To test the convergence and divergence of Series. 3. To explain Taylor Series and Maclaurin Series. 4. To understand the Partial Derivatives and the Directional Derivatives. 5. To understand Gradients and Tangents to Level Curves.. 6. To know the Extreme Values and Saddle Points. 7. To solve Differential Equations. 8. To know Laplace Transform and the Inverse Laplace Transform. 9. To know the solution of Differential Equations using Laplace Transform. 10. To understand Fourier series.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the differences between Sequences of Numbers and the Series. 2. Find the formula for any Sequences of Numbers and Series. 3. Know how to test convergence of Series. 4. Know the way to transform any function to Taylor Series or Maclaurin Series. 5. Know the way to find Partial derivatives of Equations and the Directional Derivatives. 6. Know the way to find the Tangent and normal line. 7. Identify the Maximum, Minimum and Saddle points for any functions. 8. Solve Differential Equations by Exact Methods. 9. Know the Laplace Transform and Inverse Laplace Transform for some usual functions. 10. Using Laplace Transform to solve Differential Equations. Identify the way to transform any function to Fourier Series.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Sequences of Numbers and Series</u> Sequences of Numbers, Convergence of Sequences, Infinite and Geometric Series, Test Convergence of Series, Alternating Series, Taylor Series &Maclaurin		

	Series[18 hrs.] Part B - Partial Derivatives & Directional Derivatives Second Order Partial Derivatives, Chain Rule, Directional Derivatives, Gradients and Tangents to Level Curves, Extreme Values and Saddle Points, Absolute Maxima and Minima on Closed Bounded Regions. [24 hrs.] Part C - Differential Equations First Order Differential Equations, Homogeneous Functions, Homogeneous Functions, Linear First Order Equations, Reducible to Linear, Exact Differential Equations, Reducible to Exact. [18 hrs.] Part D – Laplace Transform & Fourier Series Laplace Transform, Gamma Function, Laplace Transform for Periodic Functions, Inverse Laplace Transform, Solution of Differential Equations Using Laplace Transform, Fourier Series, Odd and Even Functions. [30 hrs.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by solving exercises by the students themself.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 9 and 10
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2 hrs.	20% (20)	7,12	LO # 1-7 ,8-12
	Final Exam	3 hrs.	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Sequences of Numbers, Convergence of Sequences.
Week 2	Infinite and Geometric Series, Test Convergence of Series.
Week 3	Alternating Series, Taylor Series & Maclaurin Series.
Week 4	Partial Derivatives, Second Order Partial Derivatives.
Week 5	Chain Rule.
Week 6	Directional Derivatives, Gradients and Tangents to Level Curves.
Week 7	Extreme Values and Saddle Points, Absolute Maxima and Minima on Closed Bounded Regions.
Week 8	Differential Equations, First Order Differential Equations, Homogeneous Functions.
Week 9	Linear First Order Equations, Reducible to Linear.
Week 10	Exact Differential Equations, Reducible to Exact.
Week 11	Laplace Transform, Gamma Function, Laplace Transform for Periodic Functions.
Week 12	Inverse Laplace Transform.
Week 13	Solution of Differential Equations Using Laplace Transform.
Week 14	Fourier Series.
Week 15	Odd and Even Functions.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Thomas, Calculus , Twelfth edition	Yes
Recommended Texts	1- Advanced Mathematics 2- 1001 Calculus Practice Problems for Dummies.	Yes
Websites	https://www.coursera.org/browse/mathematics-science	

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:				

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.

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