Ministry of Higher Education and
Scientific Research - Iraq
University of Diyala
College of Engineering
Department of Computer Engineering

الملحق ٤: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Applied Mathematics I**			**Module Delivery**	
Module Type	**Basic**			☒Theory ☒ Lecture ☐ Lab ☒Tutorial ☐Practical ☐Seminar	
Module Code	**CPE 201**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**		3
Administering Department	Computer Eng.		**College**	College of Engineering	
Module Leader	Zobeda Hatif Naji		**e-mail**	zobedadahatifnaji@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**		MSc.
Module Tutor	Zobeda Hatif Naji		**e-mail**	zobedahatifnaji@uodiyala.edu.iq	
Peer Reviewer Name	Hussien Y. Radhi Raghda Salam Ali		**e-mail**	hussienradh_eng@uodiyala.edu.iq raghdasalam@uodiyala.edu.iq	
Scientific Committee Approval Date	02/06/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	E 102	**Semester**	2
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to understand: 1. Mathematics develops the mind to think in a logical and critical manner, hence enhancing the capacity to methodically tackle and resolve issues. 2. Mathematics enables individuals to comprehend and articulate patterns, connections, and structures seen in the natural world, ranging from planetary orbits to musical rhythms. 3. Developing Analytical Skills: Engaging in the study of mathematics improves one's ability to think analytically, enabling individuals to deconstruct intricate situations into more manageable components and comprehend the fundamental laws that govern them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon Completion this Course, the students will: 1. Learn the fundamental of Power Series, theory of the Power Series Method. 2. Understand and solve the problem Fourier Analysis Arbitrary Period. Even and Odd Functions. Fourier Integral and Applications. 3. Know the Fourier Transform (DFT), Fast Fourier Transform (FFT)and inverse Fourier transform IFT. 4. Have Knowledge about Laplace Transforms, its properties, and its application. 5. Understand the inverse of Laplace Transforms for Derivatives and Integrals.
Indicative Contents المحتويات الإرشادية	1. Power Series Theory of the Power Series Method(7hrs). 2. Convergence & Divergence(1hrs). 3. Legendre Polynomials (2). 4. Extended Power Series, Euler(2hrs). 5. Fourier Analysis, Fourier Series(3hrs). 6. Arbitrary Period. Even and Odd Functions(3hr). 7. Approximation by Trigonometric Polynomials(2hrs). 8. Fourier Integral and Applications(4hrs). 9. Fourier Transform. Discrete Fourier Transform (DFT) (4hrs). 10. Fast Fourier Transform (FFT)and inverse Fourier transform IFT (3hrs). 11. Laplace Transforms concept and properties(4hrs). 12. Shifting Theorem(3hrs). 13. Inverse Laplace Transforms(3hrs). 14. Transforms of Derivatives and Integrals(hrs). 15. Differential Equations, Initial Value Problems(4hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: 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, homework's and examples. Practical examples helps students to understand the course material.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**48**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**3.2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**52**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**3.5**
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	5	10% (2)	2 and 13	LO #2 and #4
	Assignments	1	10% (10)	11 and 14	LO # 2and #5
	Class work	5	10% (2)		
	Home work	5	5% (1)		
	Projects / Lab.				
	Report	1	5% (5)		
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Power Series: Theory of the Power Series Method.
Week 2	Convergence & Divergence.
Week 3	Legendre Polynomials.
Week 4	Extended Power Series: Euler.
Week 5	Fourier Analysis: Fourier Series.
Week 6	Arbitrary Period. Even and Odd Functions.
Week 7	Approximation by Trigonometric Polynomials. Fourier Integral and Applications
Week 8	Fourier Transform. Discrete Fourier Transform (DFT), Fast.
Week 9	Fourier Transform (FFT)and inverse Fourier transform IFT.
Week 10	Laplace Transforms properties.
Week 11	Shifting Theorem.
Week 12	Inverse Laplace Transforms.
Week 13	Transforms of Derivatives and Integrals. Differential Equations, Initial Value Problems.
Week 14	Course Report.
Week 15	Midterm Exam.
Week 16	Preparatory week before the final Exam.

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

Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	R.K.Jain and S.R.K Iyengar, *Advanced Engineering Mathematics*, 3rd Edition, Narosa Publishing House, 2009.	Yes
Recommended Texts	Kenneth Stroud, *Advanced Engineering Mathematics*, 5th Edition K. F. Riley, *Mathematical-Methods for Physics & Engineering- Comprehensive Guide*, 3rd Edition. Murray Spiegel, *Schaum's* Outline *of Fourier Analysis with Applications*	Yes
Websites	https://math.mit.edu/~gs/books/itam.html Terms and Conditions of Use (lamar.edu)	

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.