



Jordan University of Science and Technology
Faculty of Engineering
Mechanical Engineering Department

ME701 Advanced Applied Mathematics - JNQF Level: 9

First Semester 2023-2024

Course Catalog

3 Credit Hours. Catalog Data: (3 Cr. Hr.) The course covers vector and tensor calculus. Topics: Ordinary differential equations. Laplace and Fourier Transforms. Sturm-Liouville problems. Partial differential equations. Applications to structural analysis, fluid mechanics, and dynamical systems Topics covered:

Text Book

Title	Applied Engineering Mathematics
Author(s)	I. Kreyzik
Edition	11th Edition
Short Name	Applied math
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref2	Elliptic Partial Differential Equations of Second Order,	David Gilbarg, Neil S. Trudinge	1st Edition	

Instructor

Name	Prof. Bourhan Taschtouch
Office Location	M5 L2
Office Hours	Sun : 09:00 - 11:00 Mon : 10:00 - 11:00 Tue : 09:00 - 11:00 Wed : 10:00 - 12:00
Email	bourhan@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun : 11:30 - 14:30 Room: LAB

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Introduction: definitions, review of ODE 2.	
Weeks 3, 4	Power series method and Bessel function	
Weeks 5, 6	Systems of linear differential equations	
Weeks 7, 8	Laplace transformation and Fourier series	
Weeks 9, 10	Fourier Integrals	
Weeks 11, 12	Partial differential equations and their solutions	
Weeks 13, 14, 15	Solution of PDE using Laplace	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Develop the ability to formulate and solve ordinary differential equations (ODEs) in the context of engineering applications through critical analysis and practical application. [1L9K1, 1L9K2]	30%	
Demonstrate mastery in solving complex engineering problems utilizing power series, Bessel functions, Laplace transformation, Fourier series, and Fourier integrals. [1L9K1, 1L9S2]	40%	
solve partial differential equations (PDEs) and apply Laplace transformations for efficient solutions, showcasing proficiency in addressing multi-dimensional engineering challenges. [1L9S1, 1L9S2]	40%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7

Relationship to NQF Outcomes (Out of 100%)			
L9K1	L9K2	L9S1	L9S2
35	15	20	40

Evaluation	
Assessment Tool	Weight

first exam	25%
Second exam	25%
Final exam	50%

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