The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Engineering Math II for Aeronautical Engineering Students	0994202	Spring

2025 Course Catalog Description

Vector differential calculus, line and surface integrals, integral theorems, Fourier series, Fourier integrals, Fourier transforms, partial differential equations.

Instructors

Name	E-mail	Section	Office Hours	Lecture Time

Text Books

	Text book 1	Text book 2
Title	Advanced Engineering Mathematics	
Author(s)	E. Kreyszig	
Publisher, Year, Edition	10th Edition	

References

Books	1) Advanced Engineering Mathematics, Dennis G. Zill and Warren S. Wright, 5th edition. 2) Advanced Engineering Mathematics, K. A. Stroud and Dexter J. Booth, 5th edition.
Journals	
Internet links	

Prerequisites

Prerequisites by topic	-
Prerequisites by course	Engineering Math I for Aeronautical Engineering Students 0994201
Co-requisites by course	
Prerequisite for	Thermodynamics Sound and Mechanical Vibrations Maintenance Practice III: Aircraft Practical Experience Aircraft Structure I Aircraft Maintenance Systems

Topics Covered

Week	Topics	Chapter in Text
1	Vector Product Curves: Circle, Ellipse, Straight Line, Helix, Plane Curves. Tangent to a Curve	
2	Gradient of a Scalar Field Divergence of a Vector Field Curl of a Vector Field	
3	Line Integrals Path Independence of Line Integrals	
4	Double Integrals Green's Theorem in the Plane	
5	Surfaces for Surface Integrals Surface Integrals	
6	Triple Integrals. Divergence Theorem of Gauss	
7	Stokes's Theorem	
8	Fourier Series	
9	Arbitrary Period. Even and Odd Functions. Half-Range Expansions	
10	Fourier Integral	

11	Fourier Cosine and Sine Transforms	
12	Fourier Transform Tables of Transforms	
13	Basic Concepts of PDEs Modeling: Vibrating String, Wave Equation	
14	Solution by Separating Variables. Use of Fourier Series Heat Equation: Solution by Fourier Series. Steady Two-Dimensional Heat Problems. Dirichlet Problem	
15	Heat Equation: Modeling Very Long Bars. Solution by Fourier Integrals and Transforms Laplace equation in Polar Coordinate	

Mapping of Course Outcomes to ABET Student Outcomes

SOs	Course Outcomes
1,2,5	1- Evaluate line and surface integrals and apply Green's, Stokes's and Divergence Theorems. 2- Find the Fourier series, Fourier integrals, and Fourier transforms for some functions, and discuss their convergence. 3- Solve PDEs by using the Fourier series, Fourier integrals, and Fourier transforms.

Evaluation

Assessment Tools	Expected Due Date	Weight
First Exam	6^{th} weak	20%
Midterm Exam	11^{th} weak	30%
Final Exam	16^{th} weak	50%

Relationship to Student Outcomes

SOs	1	2	3	4	5	6	7
Availability	X	X			X		

Relationship to Aeronautical Engineering Program Objectives (AEPOs)

AEPO1	AEPO2	AEPO3	AEPO4	AEPO5

ABET Student Outcomes (SOs)

1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	An ability to communicate effectively with a range of audiences
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Updated by ABET Committee, 2025