



Jordan University of Science and Technology
Faculty of Science & Arts
Physics Department

PHY201 Mathematical Physics(1)

First Semester 2022-2023

Course Catalog

3 Credit Hours. In this course we will discuss the following topics: scalars and vectors, triple product, gradient, divergence, curl, Stokes' theorem, Green's theorem, Divergence theorem, Poisson's and Laplace's equations, general curvilinear coordinate, Cartesian coordinates, cylindrical coordinates, spherical coordinates, separation of variables in curvilinear coordinates, first order differential equations, second order linear differential equations, method of variation of parameters, Euler differential equation, general form of Fourier series, Fourier expansion of odd and even functions, Parseval's theorem, integration and differentiation of Fourier series.

Text Book

Title	Introduction to Mathematical Physics
Author(s)	Nabil M. Laham & Nabil Y. Ayoub
Edition	2nd Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Mathematical methods in the physical science	Mary L. Boas	2nd Edition	
3	Additional materials supplied by the lecturer	N.A	1st Edition	

Instructor

Name	Prof. Hasan Al-Khateeb
Office Location	PH3 L1
Office Hours	Sun : 10:30 - 12:00 Mon : 10:30 - 11:30 Tue : 10:30 - 12:00 Wed : 10:00 - 11:00 Thu : 10:30 - 12:00

Email	hkhateeb@just.edu.jo
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Class Schedule & Room

Section 1:
Lecture Time: Sun, Tue, Thu : 12:30 - 13:30
Room: NF39

Prerequisites

Line Number	Course Name	Prerequisite Type
922000	PHY200 Introduction To Mathematical Physics	Pre./Con.
921020	PHY102 General Physics (2)	Prerequisite / Pass

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Scalars and vectors	Ch1 From 1, From 3
Week 2	Gradient, curl and divergence	Ch1 From 1, From 3
Week 3	Gauss's divergence theorem	Ch1 From 1, From 3
Week 4	Stokes' theorem	Ch1 From 1, From 3
Week 5	Potential theory	Ch1 From 1, From 3
Week 6	Curvilinear coordinates, Cylindrical coordinates	Ch2 From 1, From 3
Week 7	Spherical Coordinate	Ch2 From 1, From 3
Week 8	Separation of variables, First order differential equation	Ch2,6 From 1, From 3
Week 9	Second order differential equation: Homogeneous	Ch6 From 1, From 3
Week 10	Second order differential equation: inhomogeneous	Ch6 From 1, From 3
Week 11	Method of variation and Euler's equation	Ch6 From 1, From 3
Week 12	Calculation of Fourier coefficients, Complex form of Fourier series	Ch7 From 1, From 3

Week 13	Odd and even function and Parsevals theorem	Ch7 From 1, From 3
Week 14	Differentiation and integration of Fourier series	Ch7 From 1, From 3

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Learning vector analysis in different coordinate systems [31]	57%	First Exam, Second Exam, Homework, Quizzes, Final Exam
Solve first and second-order linear differential equations [31]	20%	Homework, Quizzes, Final Exam
Expand periodic functions in terms of Fourier Series [31]	11%	Homework, Quizzes, Final Exam
Learn how to apply Stokes' and Divergence theorems to calculate the work and the flux [31]	12%	First Exam, Second Exam, Homework, Quizzes

Relationship to Program Student Outcomes (Out of 100%)					
1	2	3	4	5	6
100					

Evaluation	
Assessment Tool	Weight
First Exam	20%
Second Exam	20%
Homework	10%
Quizzes	10%
Final Exam	40%

Policy	
Lectures attendance and grading	<p>Students are required to come to the class on time. None will be allowed to enter the class later than 5 minutes from the start of the class. Students are requested to follow the attendance policy strictly which has been set by the university.</p> <p>Grading will be based on the following weighting:</p> <p>Midterm Exam: 30% Homework and Quizzes:20% Final Exam:50%</p>

Date Printed: 2023-02-07