Jordan University of Science and Technology

Faculty of Science & Arts

Physics Department

PHY201 Mathematical Physics(1)
First Semester 2017-2018

Course Catalog
3 Credit Hours. 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	

Instructor	
Name	**Dr. Abdalla Obeidat**
Office Location	PH3 L1
Office Hours	Sun : 10:30 - 11:30 Mon : 13:30 - 14:30 Tue : 12:30 - 13:30 Wed : 14:30 - 16:00 Thu : 14:30 - 16:00
Email	aobeidat@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 09:30 - 10:30 Room: M1304

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

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Scalars and vectors	**CH1** From **1**
Week 2	Gradient, curl and divergence	**Ch1** From **1**
Week 3	Gauss?s diveregence theorem	**Ch1** From **1**
Week 4	Stokes? theorem	**Ch1** From **1**
Week 5	Potential theory	**Ch1** From **1**
Week 6	Curvilinear coordinates, Cylindrical coordinates	**Ch2** From **1**
Week 7	Spherical Coordinate	**Ch2** From **1**
Week 8	Separation of variables, First order differential equation	**Ch2,6** From **1**
Week 9	Second order differential equation: Homogeneous	**Ch6** From **1**
Week 10	Second order differential equation: inhomogeneous	**Ch6** From **1**
Week 11	Method of variation and Euler?s equation	**Ch6** From **1**
Week 12	Calculation of Fourier coefficients, Complex form of Fourier series	**Ch7** From **1**
Week 13	Odd and even function and Parsevals theorem	**Ch7** From **1**
Week 14	Differentiation and integration of Fourier series	**Ch7** From **1**

Mapping of Course Objectives to Program Student Outcomes[1]	Assessment method
1.1. Learn how to apply Stokes? and Divergence theorems to calculate the work and the flux. [2(a), 1(c), 1(e), 1(k)]	
2.1. Apply the method of separation of variables to Laplace equation in Cartesian, cylindrical and spherical coordinates. [2(a), 1(c), 1(e), 1(k)]	
3.1. Learn how to solve first and second order differential equations using different methods [2(a), 1(c), 1(e), 1(k)]	

4.1. Learn when and how to apply Fourier expansion [2(a), 1(c), 1(e), 1(k)]	

Relationship to Program Student Outcomes (Out of 100%)										
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
40		20		20						20

Date Printed: 2017-11-28