



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

PHY331 Electromagnetic Theory (1)

First Semester 2017-2018

**Course Catalog**

3 Credit Hours. Stokes' theorem, Divergence theorem, Potential theory, Coulomb's law, Electric field, Gauss's law, electrostatic energy, capacitors, Laplace equation in one-two and three dimensions, multipole expansion, uniqueness theorem, method of images, dielectric media, polarization, bound charges, susceptibility and permittivity, magnetic field, magnetic force, Divergent and curl of magnetic field, Ampere's law, vector potential, multipole expansion of the vector field.

**Text Book**

<b>Title</b>	Introduction to Electrodynamics
<b>Author(s)</b>	David Griffiths
<b>Edition</b>	4th Edition
<b>Short Name</b>	Griffiths
<b>Other Information</b>	

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Milford	Foundation of Electromagnetic Theory	Reitz, Milford and Christy.	4th Edition	
Schwartz	Principles of Electrodynamics	Melvin Schwartz	1st Edition	

**Instructor**

Name	<b>Dr. Abdalla Obeidat</b>
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 : 11:30 - 12:30 Room: M1304

Prerequisites		
Line Number	Course Name	Prerequisite Type
923010	PHY301 Mathematical Physics (2)	Pre./Con.

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Differential and Integral Calculus, Dirac delta function and theory of vector fields	<b>Ch1</b> From <b>Griffiths</b>
Weeks 3, 4, 5	Electrostatic fields, Divergence and Curl of Electrostatic, Electric potential and conductors	<b>Ch2</b> From <b>Griffiths</b>
Weeks 6, 7, 8	Laplace's equation, Method of images, Separation of variables, Multipole Expansion	<b>Ch3</b> From <b>Griffiths</b>
Weeks 8, 9, 10	Polarization ,Electric Displacement ,Linear Dielectrics	<b>Ch4</b> From <b>Griffiths</b>
Weeks 12, 13	Lorentz Force law, Biot-Savart law ,Divergence and Curl of magnetic field, Magnetic vector potential	<b>Ch5</b> From <b>Griffiths</b>
Week 14	Magnetostatic field in matter	<b>Ch6</b> From <b>Griffiths</b>

Mapping of Course Objectives to Program Student Outcomes <sup>1</sup>	Assessment method
1. Applying potential theory to calculate the electric field [2(a), 1(c), 1(e), 1(k)]	First Exam, quizzes
2. Solving the Laplace equation and one, two and three dimensions using different curvilinear coordinates to calculate the electric potential [2(a), 1(c), 1(e), 1(k)]	quizzes
3. Differentiate between insulators and conductors and how to calculate the electric potential if the material is an insulator. [2(a), 1(c), 1(e), 1(k)]	quizzes

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

<b>Evaluation</b>	
<b>Assessment Tool</b>	<b>Weight</b>
First Exam	20%
quizes	20%

Date Printed: 2017-11-28