



University of Management and Technology

School of Science and Technology

Department of Physics

Course Code: PH 419

Course Title: Electromagnetic Theory-1

Program: BS (Phy)

Course Outline

Schedule	Monday, Thursday 2:00-3:15	Pre-requisite	PH 416-Electromagnetic Theory-I
Course Coordinator	H. Arslan Hashim	Contact	arslan.hashim@umt.edu.pk
Course description	<p>Mechanics tells us how a system will behave when subjected to a given force. There are just four basic forces known (presently) to physics: I list them in the order of decreasing strength: 1. Strong 2. Electromagnetic 3. Weak 4. Gravitational. The brevity of this list may surprise you. Where is friction? Where is the "normal" force that keeps you from falling through the floor? Where are the chemical forces that bind molecules together? Where is the force of impact between two colliding billiard balls? The answer is that all these forces are electromagnetic. Indeed, it is scarcely an exaggeration to say that we live in an electromagnetic world virtually every force we experience in everyday life, with the exception of gravity, is electromagnetic in origin.</p> <p>This is an undergraduate level introduction to electrodynamics. The course is consist of three parts. A remaining part of magnetostatics which is magnetic fields in matter. In the second part, we discuss the electrodynamics i.e. time varying fields.. Part three concludes the special relativity and relativistic electrodynamics.</p>		
Learning outcomes	<p>After completion of the course student will be able to</p> <ul style="list-style-type: none"> • Understand the magnetostatics in materials • Able to solve the simple problems where charges and currents vary with time • Apply knowledge to the problems involving charges and currents moving with speed of ligh. 		
Textbook	Introduction to Electrodynamics, Griffiths 3 rd Ed.		
Reference Book:	Modern Electrodynamics by Zangwill (2012, First Edition)		
Assignments	Problems will be assigned at regular intervals as an assignment.	Quizzes	All quizzes will be announced well before time. No make-ups will be offered for missed quizzes.
Mid Term Examination	A 60-minutes on campus exam will cover all the material covered during the first 14-16 lectures.	Final Examination	A 120-minutes on campus exam will cover all the material covered during the semester.
Attendance Policy	Students missing more than 25% of the lectures will receive an "SA" grade in the course and will not be allowed to take Final exam.		



Department of Physics

Electromagnetic Theory-II (PH 419)

Week	TOPICS	Readings
1	Magnetic Fields in Matter	Chapter 6
2	Magnetic Fields in Matter	Chapter 6
3	Electrodynamics	Chapter 7
4	Electrodynamics	Chapter 7
5	Conservation Laws Electromagnetic Waves	Chapter 8 Chapter 9
6	Electromagnetic Waves	Chapter 9
7	Electromagnetic Waves	Chapter 9
8	Potentials and Fields	Chapter 10
9	Potentials and Fields	Chapter 10
10	Radiation	Chapter 11
11	Radiation	Chapter 11
12	Radiation Electrodynamics and Relativity	Chapter 11 and 12
13	Electrodynamics and Relativity	Chapter 12
14	Electrodynamics and Relativity	Chapter 12
15	Electrodynamics and Relativity	Chapter 12