BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

INSTRUCTION DIVISION
FIRST SEMESTER 2015-2016
Course Handout (Part-II) *Date: 03.08.2015*

In addition to part I (General handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course Number : PHY F212
Course Title : Electromagnetic Theory I
Instructor-in-Charge : Niladri Sarkar
Instructors : Niladri Sarkar, Amol Holkundkar

Scope & Objective of the course:
Electromagnetic Theory I is the first of the two courses on Electromagnetic Theory to be offered to Physics students. It is also a mandatory course for Chemistry students. It deals with Electricity, Magnetism and Electromagnetic waves.

Text Book: *"Introduction to Electrodynamics",* David J.Griffiths, Third Edition, Pearson Education Inc., 1999.

Reference Book: *"Berkeley Physics Course Vol. 2, Electricity & Magnetism",* ***Edward M Purcell,*** Special Indian Edition: Tata McGraw-Hill Publishing Company Limited

Course Plan:

Lecture Number	Learning Objectives	Topics to be covered	Reference Chapter/ Section
1-6	Vector Algebra	Gradient, Divergence and Curl, Line, Surface and Volume Integrals, Curvilinear co-ordinates, Dirac Delta Function	1.2-1.6
7-11	Electrostatics	Divergence and Curl of electrostatic fields, Electric potential, Work and Energy in Electrostatics	2.1-2.4
12	Conductors	Conductors, Induced charges, Capacitors	2.5
13-15	Special techniques	Laplace's Equation, Method of Images, Multipole expansion	3.1,3.2, 3.4
16-20	Electric Fields in Matter	Polarization, bound charges, electric displacement, Dielectrics	4.1-4.4
21-28	Magnetostatics	Lorentz force law, Biot-Savart law, Ampere's law, Magnetic Vector potential	5.1-5.4
29-33	Magnetic fields in Matter	Magnetization, the field of a magnetized object, Ampere's law in magnetized materials, Magnetic susceptibility and permeability, Ferromagnetism	6.1-6.4

34-37	Electrodynamics	Electromotive force, Ohm's law, Electromagnetic Induction, Faraday's law	7.1-7.2
38-40	Maxwell's Equations	Maxwell's equations, Boundary conditions	7.3

Evaluation Scheme:

EC No.	***Evaluation Component***	***Duration***	***Weightage (%)***	***Date, Time & Venue***	***Remarks***
1.	Mid. Sem. Test	90 Min.	30	10/10 8:00 - 9:30 AM	Closed Book
2.	Tutorial tests	20 Min. each	30		Total five tests will be conducted, of which four best would be counted. (Each closed book)
4.	Comp. Exam	3 Hours	40	12/12 FN	Closed/Open Book

Chamber Consultation Hour: To be announced in the respective tutorials and lecture classes.

Notices: Notices and solutions of tests & Compre. will be displayed only on **FDIII** notice board.

Make-up Policy: Very strict to **genuine cases only** i.e. **(i)** Sickness leading to hospitalization, **(ii)** Out of station with prior intimation & permission. Make-up will NOT be granted for tutorial tests.

Instructor-in-Charge

PHY F212