

PHY 603 REVIEW of CLASSICAL ELECTRODYNAMICS, 1-3-0-9

Course Objectives: This course is aimed at providing a comprehensive review of the core concepts of classical electrodynamics through problem solving and introducing some advanced topics with illustrative examples

Course Contents: Basic electrodynamics in non-covariant formalism: Maxwell's equations, vector and scalar potentials, multipole expansion; dielectric and magnetic media; boundary value problems; energy and momentum of electromagnetic fields, conservation laws; electromagnetic waves in vacuum and material media; wave guides and resonant cavities; multipole radiation; Maxwell's equations in covariant formalism; gauge transformations; Wave equation in terms of gauge fields and solution; Electrodynamics as classical field theory; radiation by accelerated point charges.

Course Organization: All notices for the course will be sent by email to the course email list. Regular Home Assignments will be given. The students are strongly advised to solve all the problems given in the home assignment.

Exams, Quizzes and Home Assignments: There will be one mid-semester examination of two hours and, an end-semester examination of three hours. These will be held during the prescribed examination period. There will be regular quizzes and home assignments. It should be possible to do reasonably well in this course by being involved and attentive during the lectures/tutorials and solving problems given in the Home Assignment.

Attendance: It goes without saying that 100% attendance is compulsory. Any student who is granted leave by the Convener, DPGC also must inform the instructor regarding his/her absence.

References: This being a PG course, there is no prescribed textbook as such. However, the following books are recommended as references.

1. J D Jackson, Classical Electrodynamics
2. D J Griffiths, Introduction to Electrodynamics
3. Landau and Lifshitz, Classical theory of fields
4. Landau and Lifshitz, Electrodynamics of continuous media