Course: Electromagnetism II

Code: PHYS 4069

Number of Credits: 3

Prerequisites: MATH 3152, PHYS 3171-3172, PHYS 4068

Instructor: J. Ponce de León

Office: Natural Sciences II, C-321

E-mail: jpdel1@hotmail.com

Class period: Monday and Wednesday, 1:00-2:40 PM, room C-312

Office hours: Monday and Wednesday, 10:30-12:30 or by appointment

Description

This is the second part of the one year course in Electromagnetism for Physics majors, which covers electrostatics, magnetostatics and electrodynamics: Electromagnetic induction, Maxwell equations, Conservation Laws, Electromagnetic waves in one dimension in vacuum and matter, Potential and radiation

Objectives

After completing this course the student will be able to apply the Maxwell equations in different physical situations and setup the corresponding mathematical problem.

Instructional Strategy

The main instructional tool in this class is lecturing. The students are trained to apply the Maxwell equations to simple physical situations and setting up the problem mathematically, which is then solved using standard mathematical methods. A fair part of the lecturing effort is thus dedicated to the demonstration of solution of problems of electromagnetism. Homework assignments allow the students to use the relevant physics concepts and practice problem solving techniques discussed in class. Solutions of homework problems are subsequently discussed in class, where the students are encouraged to present their work.

Grading

- The grading is based on four exams, each of which has a weight of 25% of the final grade. They will be based on examples done in class, suggested problems, and exercises given through the course. The date of the partial exams will be agreed in classes. The date of the final exam is suggested by the registrar.

Course: Classical Electrodynamics

Code: PHYS 6431

Number of Credits: 3

Prerequisites: PHYS 4068 , 4069

Instructor: J. Ponce de León

Office: Natural Sciences II, C-321

E-mail: jpdel1@hotmail.com

Class period: Tuesday and Thursday, 11:00-12:40 PM, room C-209

Office hours: Tuesday and Thursday, 1:30-3:00 PM or by appointment

Text

- Classical Electrodynamics, Third Edition (Jackson J.D.)

Description

In this course a rigorous study is made, emphasizing the theoretical structure of the physical and mathematical foundations of electromagnetism.

Instructional Strategy

The main instructional tool in this class is lecturing. A fair part of the lecturing effort is dedicated to the demonstration of theoretical techniques used in electrodynamics. Homework assignments allow the students to use and practice the techniques discussed in class. Solutions of homework problems are subsequently discussed in class, where the students are encouraged to present their work.

Grading

- The grading is based on four exams, each of which has a weight of 25% of the final grade. They will be based on examples done in class, suggested problems, and exercises given through the course. The date of the partial exams will be agreed in classes. The date of the final exam is suggested by the registrar.

Objectives

At the end of the course students should be able to choose and apply the problem-solving technique that is appropriate for a particular situation (e.g., whether to use the integral or differential forms of Maxwell's equations), and explain its physical meaning. They should develop a critical sense to identify the limitations of a result based on the assumptions made in its derivation.