

Course Title: Exploring Electrodynamics

Course Number: SCE320.2

Course Credits: 2

Core/FE/Elective: Elective

Instructor(s): Anwesh Mazumdar

Course Starting Date: To be announced

Day & Time preference: Tuesday (11 AM to 1 PM)

Course Duration: January to April, 2023

Course Outcomes:

- (a) Revision of basic concepts in undergraduate level electricity and magnetism;
- (b) Overview of major PER works on E&M;
- (c) Foundation for future PER work in E&M.

Detailed Course Outline:

This course will review the basic concepts of classical electricity and magnetism as learned by an undergraduate student in an average Indian university. We shall go over the major topics of electrostatics, magnetostatics and electrodynamics, with special emphasis on problem solving. Important mathematical tools that are necessary for the development of the subject will also be reviewed. However, specialised methods of problem solving may be skipped. We shall review major PER works in this area, and connect them with our own learning of the topic in the course. Overall, this course will be primarily content-oriented.

Assessment/Grading Scheme:

Evaluation will be based on weekly/bi-weekly assignments, a term paper presentation and an endsem exam.

References (if any):

We shall mainly follow Griffiths' book on Electrodynamics ("Introduction to Electrodynamics" by David J. Griffiths), with occasional reference to Purcell "Electricity and Magnetism" by E. M. Purcell and D. Morin). A prerequisite of high school level physics and mathematics is needed.