ENG EC 455: Electromagnetics Systems I

Fall, 2019

Lecturer: Professor Min-Chang Lee
mclee@bu.edu
Office hours Tuesday/Thursday, 3:30 – 4:30 PM in PHO 418

Lectures: Tuesday/Thursday, 1:30 – 3:15 PM in PHO 205

Teaching Assistants: TBA

Discussion Sessions:  Tuesday,  6:30 – 7:20 PM, (B2 section in EPC 206)
                   Wednesday, 6:30 – 7:20 PM, (B1 section in EPC 203)
                   (B3 section in EPC 206)

Textbooks:  M.O. Sadiku, “Elements of Electromagnetics”, Oxford University
            notes.

Grading Policy:  Homework: 20%
                 Mid-term exam 1: 25%
                 Mid-term exam 2: 25%
                 Final exam: 30%

                 Midterm Exam (1) on Friday Oct 11 in PHO 211.
                 Midterm Exam (2) on Friday Nov 15 in PHO 211.
                 Final Exam (TBA).

                 Homework will be collected in the class.
                 Late homework will not be accepted.

COURSE SCHEDULE

1. Sept. 3 Introduction, A preview of the course, units (Chapter 1)

2. Sept. 5 Scalar and Vector, Systems of Coordinates (lecture notes, Chap. 2).

3. Sept. 10 Vector Calculus, time averages (lecture notes, Chap. 3).

5. Sept. 17 Forms of Maxwell’s equations and time-varying potential (9.5 – 9.6), boundary conditions (lecture notes).


8. Sept. 26 EM wave polarization, Ponting vector and power, 10.7 – 10.8).

9. Oct. 1 Reflection and transmission of plane waves at normal incidence, 10.9, lecture notes.

10. Oct. 3 Reflection and transmission of plane waves at oblique incidence, 10.10, lecture notes.


12. Oct. 10 TL equations and analysis, 11.3 and lecture notes.

13. Oct. 11 (Friday) 1st Midterm Exam


17. Oct. 29 Impedance matching, 11.6 – 11.8.


19. Nov. 5 Rectangular waveguides, 12.1-12.2.

20. Nov. 7 TM and TE modes, 12.3 – 12.4.

21. Nov. 12 Wave propagation in the guides, 12.5, lecture notes


23. Nov. 15 (Friday) 2nd Midterm Exam


27. Dec. 3 Antenna arrays, 13.7.

28. Dec. 5 Antenna arrays, lecture notes, and effective area and backscatter cross section, radars, 13.8.

29. Dec. 10 Radar equation, 13.9; Review for the Final Exam

30. TBA Final Exam.