Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Electrical-Electronics Engineering Department
2023-2024 Fall Semester

Syllabus

Code/Name	EEE 303 / Electromagnetic Waves
Type	Required
Credit/ECTS	6/6
Hour per Week	4
Level/Year	Undergraduate/3
Semester	Fall
Classroom	A103
Content	Maxwell's equations in time and frequency domains, Electromagnetic Energy and Power, Wave Equation, Uniform Plane Waves, Reflection Transmission and Refraction. Introduction to Transmission Lines.
Prerequisites	None
Textbooks	***Primary*** D.Cheng, Field and Wave Electromagnetics, Addison-Wesley, 2nd Edition ***Supplementary*** J.A.Edminister, Electromagnetics, Schaum Outline Series.
Objectives	• To learn Maxwell's equations and constitutive relations in the most general form • To learn fundamental principles and teorems of Electromagnetic Wave Theory • To learn plane wave functions • To learn transmission lines
Course Outcomes	In this course you will be able to: CO1 Understand and can use Maxwell equations in point form and in integral form CO2 Understand Faraday's law and can use it in problem solving CO3 Can derive wave equation using Maxwell's equations CO4 Know and use planar wave solutions of wave equation CO5 Analyze the behaviour of planar waves at interfaces

Weekly Schedule of Topics

W	Topic
1	Review of vector analysis, potential functions
2	Point form and integral form of maxwell's equations, time-harmonic fields
3	Scalar wave equation, solutions of wave equation, helmholtz equation.
4	Plane waves in a simple, source-free medium
5-6	The propagation of time-harmonic electromagnetic waves in a lossless medium, wave behavior in space and time
7	Uniform plane wave propagation in lossy dielectric and in a good conductor
8	Boundary conditions for electromagnetic fields.
9	Uniform plane waves in an arbitrary direction, non-uniform plane waves
10	Poynting' theorem, electromagnetic power carried by a uniform plane wave, instantaneous and time-average power, complex poynting theorem.
11	linear polarization, circular polarization, elliptical polarization
12	Reflection, transmission and refraction of waves at planar interfaces: normal incidence , multiple dielectric interfaces, oblique incidence, total internal reflection

13-14 Transmission line parameters, transmission line equations, voltage and current wave equations

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	0	0	0	0	1	3	0	0	0
CO2	3	3	0	0	0	0	1	3	0	0	0
CO3	2	2	0	0	0	0	1	3	0	0	0
CO4	3	3	0	0	0	0	1	3	0	0	0
CO5	3	3	0	0	0	0	1	3	0	0	0

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Requirements	Basic knowledge of Electromagnetic Field Theory
Course Policy	• Be in the class on time. • English should always be used to communicate with one another. • At least 70% attendance is required, otherwise a grade of **DZ** will be assigned.
Cheating & Plagiarism	• Copying or letting someone copy your work on exams, assignments, or reports is cheating. • Cutting and pasting text, figures and tables from web sources or any other electronic source is plagiarism. • The consequence of academic dishonesty is to receive a grade of **FF** for the course.
Evaluation	Midterm 40% Final Exam 60% Total 100%

Instructor

Name/Surname	Akın Uslu	Email	akin.uslu@alanya.edu.tr
Room	209	Office Hours	W 11.30-12.30 | F 13.30-14.30

Prepared by Akın Uslu on june 10th, 2024.