GAU, Faculty of Engineering

Course Unit Title	Electromagnetic Theory II
Course Unit Code	EEN348
Type of Course Unit	Compulsory, Electrical-Electronics Engineering
Level of Course Unit	3rd Year, Undergraduate
National Credits	4
Number of ECTS Credits Allocated	7 ECTS
Theoretical (hour/week)	4
Practice (hour/week)	-
Laboratory (hour/week)	-
Year of Study	3
Semester when the course unit is delivered	6. Semester, Spring
Mode of Delivery	Face to Face
Language of Instruction	English
Prerequisities and co-requisities	EEN347 Electromagnetic Theory I
Recommended Optional Programme Components	Vector Calculus and Differential Equations

Objectives of the Course: At the end of the course, students will be able to,

- Analyse simple magnetic circuits
- Distinguish the mathematical expressions that represent waves and electromagnetic waves
- Express the Wave Propagation
- Relate the electromagnetic waves with the classical and modern applications.

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Analyze simple magnetic circuits	1
2	Explain main characteristics of time varying fields	1
3	Compute the field components under the given conditions	1
4	Solve the one dimesional wave equation	1,2
5	Formulate the polarization of plane waves	1,2

Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5 Lab. Work

Course's Contribution to Program

		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	5
2	Ability to design and conduct experiments as well as to analyze and interpret data	1
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	1
4	Ability to apply systems thinking in problem solving and system design	4
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	2
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	3
7	Ability to express their ideas and findings, in written and oral form	2
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	2
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	1
10	Strong foundation on the fundamentals of Electrical and Electronics Engineering such as Circuit Theory, Signals, Systems, Control and Communications, which are necessary for successful practice in the field	5
11	Awareness on the contemporary requirements, methods and applications of the Electrical and Electronics Engineering	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate 4: High, 5:Very High)

Course Content

Week		Exams
1	Static Magnetic Fields	
2	Faraday's Law	
3	Magnetic Circuits and Transformers	
4	Time Varying Fields and Maxwell's Equations	
5	Equation of Continuity	
6	Potential Functions	
7	The Wave Equation	
8		Midterm
9	Solution of the one dimesional wave equation and the wave propagation	
10	Time harmonic Fields	
11	Plane Waves	
12	Boundary Conditions	Quiz
13	Lossy Media	
14	Polarization of Waves	
15	Fundamentals of anttenas	Final

Recommended Sources

Textbook: David K. Cheng, Fundamentals of Electromagnetic Theory, Addison-Wesley, 1994.

Supplementary Material (s): W. Hayt, Engineering Electromagnetics, McGraw-Hill, 1989.

Assessment

Attendance	5%	
Midterm Exam	30%	Written
Quiz	20%	Written
Final Exam	45%	Written
Total	100%	

ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including the Exam week)	15	4	60
Labs and Tutorials	-	-	-
Assignments	4	4	16
Project/Presentation/Report Writing	1	8	8
E-learning Activities	8	2	16
Quizzes	1	15	15
Midterm Examination	1	15	15
Final Examination	1	15	15
Self Study	13	4	52
Total Workload			197
Total Workload/30 (h)			6.567
ECTS Credit of the Course			7