GAU, Faculty of Engineering

Course Unit Title	Circuit Theory
Course Unit Code	EEN303
Type of Course Unit	Compulsory, Electrical engineering students
Level of Course Unit	3rd Year BSc
National Credits	4
Number of ECTS Credits Allocated	7 ECTS
Theoretical (hour/week)	3
Practice (hour/week)	-
Laboratory (hour/week)	2
Year of Study	5
Semester when the course unit is delivered	Fall
Mode of Delivery	Face to Face, Laboratory Experiments, E-learning activities
Language of Instruction	English
Prerequisities and co-requisities	ENG201
Recommended Optional Programme Components	Differential Equations

Objectives of the Course: Students will be able to,

- Distigguish the need of different methods in analysing circuits.
- Analyse Circuits in phasor domain.
- Analyse Power in circuits
- Analyse Circuits in Laplace domain.

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Analyze circuits by phasors	1
2	Calculate AC power, Active reactive power	1,4
3	Analyse the First order circuits by Diff. Equations	1
4	Analyse Circuits by Laplace Transforms	1,4
5	Use a circuit simulator efficiently	2,5

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	4
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	3
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	1
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 Contents

Week			Exams
1		Introduction	
2		Review of methods and theorems of circuit theory	Assign. 1
3	Chapter 9	Phasors	
4		Circuit Analysis with Phasors	Assign. 2
5		"	
6	Chapter 10	Power in Circuits (time domain)	Assign. 3
7		Power in Circuits (phasor domain)	
8		"	
9			Midterm
10	Chapter 13	Intro. to Laplace Transforms	
11		"	Assign. 4
12	Chapter 14	Laplace transforms in circuit analysis	Quiz
13		"	
14		"	
15			Final

Recommended Sources

Textbook: Electric Circuits, James W. Nilsson and Susan A. Riedel, Addison Wesley Publishing Company, (8th Edition 2008) (Other editions are also useful)

Supplementary Material (s): Fundamentals of Electric Circuits, C.K. Alexander & M. N. O. Sadiku, McGraw-Hill, 2001

Assessment

Attendance& E-learning	5%	
Laboratory+e-learning	10%	
Midterm Exam	25%	Written
Quiz	15%	Written
Final Exam	40%	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	3	45
Labs and Tutorials	13	2	26
Assignments	-	-	-
Project/Presentation/Report Writing	4	4	16
E-learning Activities	12	4	48
Quizzes	1	6	6
Midterm Examination	1	12	12
Final Examination	1	15	12
Self Study	14	3	42
Total Workload			207
Total Workload/30 (h)			6.9
ECTS Credit of the Course			7