GAU, Faculty of Engineering

Course Unit Title	Signals and systems
Course Unit Code	EEN307
Type of Course Unit	Compulsory, All electrical students
Level of Course Unit	3rd Year BSc
National Credits	3
Number of ECTS Credits Allocated	5 ECTS
Theoretical (hour/week)	2
Practice (hour/week)	-
Laboratory (hour/week)	2
Year of Study	3
Semester when the course unit is delivered	5
Mode of Delivery	Face to Face, Assignments
Language of Instruction	English
Prerequisities and co-requisities	MT112
Recommended Optional Programme Components	Basic background Calculus II

Objectives of the Course:

- Understand the fundamental characteristics of signals and systems.
- Study time and frequency domain representation of linear systems.
- Overall system characteristics
- To develop mathematical skills to analyze signals using transformation methods.

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Understand the difference between continous and discrete time signals	1
2	Ability to determine period of any real time signal.	1
3	Understand and being able to apply time scaling, time shifting on signals	1
4	Calculate Fourier series coefficients on real time signals	1
5	Conduct experiments(using matlab software) to support all work covered in the course	3,5

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	4
2	Ability to design and conduct experiments as well as to analyze and interpret data	5
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	2
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	
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	4
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	1
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3
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		Basic continous and discrete time signals and their properties.	
2		Signal energy and signal power	
3		Even and odd components of signals	
4		Periodicity and periods of real time signals	
5		Transformation of the independent variable	
6		Elementary signals (Exponential, Sinusoidal, Complex)	
7		Step and impulse response functions.	
8			Midterm
9		Sytem viewed as interconnection of operations.	
10		System properties	
11		Time domain Linear Time Invariant systems(LTI)	
12		The convolution sum and convolution integral operations	
13		Fourier series	
14			Quiz
15			Final

Textbook: Signals and Systems, Simon Haykin and Barry Van Veen, John Wiley and SonsAddison Publishing Company, (2nd Edition 2008) (Other editions are also useful)

Supplementary Material (s): -

Assesments

Research	-	
Laboratory	20%	
Midterm Exam	30%	Written
Quiz	10%	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	2	30
Labs and Tutorials	8	2	16
Assignments/Presentation/Report Writing	-	-	-
Lab Quiz	1	4	4
Quizzes	2	4	8
Midterm Examination	1	12	12
Final Examination	1	12	12
Self Study	14	5	70
Total Workload			152
Total Workload/30 (h)			5.06
ECTS Credit of the Course			5