

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	
Prerequisites and co-requisites	MT112	
Recommended Optional Programme Components	Basic background Calculus II	
Objectives of the Course:		
<ul style="list-style-type: none"> ➤ 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 continuous 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		System 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																		
<p>Textbook: Signals and Systems, Simon Haykin and Barry Van Veen, John Wiley and Sons Addison Publishing Company, (2nd Edition 2008) (Other editions are also useful)</p> <p>Supplementary Material (s): -</p> <p>Assesments</p> <table border="1"> <tbody> <tr> <td>Research</td> <td>-</td> <td></td> </tr> <tr> <td>Laboratory</td> <td>20%</td> <td></td> </tr> <tr> <td>Midterm Exam</td> <td>30%</td> <td>Written</td> </tr> <tr> <td>Quiz</td> <td>10%</td> <td>Written</td> </tr> <tr> <td>Final Exam</td> <td>40%</td> <td>Written</td> </tr> <tr> <td>Total</td> <td>100%</td> <td></td> </tr> </tbody> </table>				Research	-		Laboratory	20%		Midterm Exam	30%	Written	Quiz	10%	Written	Final Exam	40%	Written	Total	100%	
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Laboratory	20%																				
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Final Exam	40%	Written																			
Total	100%																				
ECTS Allocated Based on the Student Workload																					
	Activities	Number	Duration (hour)																		
	Course duration in class (including the Exam week)	15	2																		
	Labs and Tutorials	8	2																		
	Assignments/Presentation/Report Writing	-	-																		
	Lab Quiz	1	4																		
	Quizzes	2	4																		
	Midterm Examination	1	12																		
	Final Examination	1	12																		
	Self Study	14	5																		
	Total Workload		152																		
	Total Workload/30 (h)		5.06																		
	ECTS Credit of the Course		5																		