

## GAU, Faculty of Engineering

<b>Course Unit Title</b>	Communication System	
<b>Course Unit Code</b>	EEN403	
<b>Type of Course Unit</b>	Compulsory, All electrical students	
<b>Level of Course Unit</b>	4th Year BSc	
<b>National Credits</b>	3	
<b>Number of ECTS Credits Allocated</b>	5 ECTS	
<b>Theoretical (hour/week)</b>	2	
<b>Practice (hour/week)</b>	-	
<b>Laboratory (hour/week)</b>	2	
<b>Year of Study</b>	4	
<b>Semester when the course unit is delivered</b>	7	
<b>Mode of Delivery</b>	Face to Face, Assignments	
<b>Language of Instruction</b>	English	
<b>Prerequisites and co-requisites</b>	EEN307	
<b>Recommended Optional Programme Components</b>	Signal applications in communication systems.	
<b>Objectives of the Course:</b>		
<ul style="list-style-type: none"> <li>➤ Introduce students to the fundamental theory of analog and digital communication systems.</li> <li>➤ Study time and frequency domain representation of linear systems.</li> <li>➤ Overall system characteristics</li> <li>➤ To develop mathematical skills to analyze signals using transformation methods.</li> </ul>		
<b>Learning Outcomes</b>		
When this course has been completed the student should be able to		Assesment.
1	Understand the main units in communications	1
2	Study the main difference between different electromagnetic wave propagations	1
3	Calculate the information measure and rate in DT signal during transmission	1
4	Identify bandwidth limitation and possible improvements in channel during transmission	1
5	Design convolutional coding using shift registers in transmission	3,5
Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5 Lab. Work		
<b>Course's Contribution to Program</b>		
		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)		

<b>Course Contents</b>			
Week			Exams
1		Basic continuous and discrete time signals and their properties.	
2		Signals and their spectra	
3		Electromagnetic wave propagations in communication	
4		Fourier transformation	
5		Shannon's theory in communication channel	
6		Cont.	
7		Pulse modulation	
8			Midterm
9		Amplitude Modulation	
10		Frequency modulation	
11		Double Side Band Transmission	
12		Single Side Band Transmission	
13		Frequency division multiplexing	
14		Time division multiplexing	
15			Final
<b>Textbook:</b> Communication Systems, 4th Edition, Prentice Hall, USA 2001			
<b>Supplementary Material (s): -</b>			
<b>Assesments</b>			
Research	-		
Laboratory	10%		
Midterm Exam	30%	Written	
Quiz	20%		
Final Exam	40%	Written	
Total	100%		
<b>ECTS Allocated Based on the Student Workload</b>			
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