

## GAU, Faculty of Engineering

<b>Course Unit Title</b>	Computer Networks	
<b>Course Unit Code</b>	CEN410	
<b>Type of Course Unit</b>	Technical Elective, Computer Engineering Students	
<b>Level of Course Unit</b>	4 <sup>th</sup> Year BSc	
<b>National Credits</b>	3	
<b>Number of ECTS Credits Allocated</b>	6 ECTS	
<b>Theoretical (hour/week)</b>	3	
<b>Practice (hour/week)</b>	-	
<b>Laboratory (hour/week)</b>	-	
<b>Year of Study</b>	4	
<b>Semester when the course unit is delivered</b>	7/8	
<b>Mode of Delivery</b>	Face to Face	
<b>Language of Instruction</b>	English	
<b>Prerequisites and co-requisites</b>	-	
<b>Recommended Optional Programme Components</b>	Basic background Computing and Boolean Algebra	
<b>Objectives of the Course:</b>		
<ul style="list-style-type: none"> <li>➤ Introduce the fundamental concepts of computer networks.</li> <li>➤ Teach the basic performance and network engineering concepts</li> <li>➤ Overview the hardware/software, protocols and layers, OSI and TCP/IP reference models.</li> <li>➤ Data link layer design issues including encoding, framing and multiple access.</li> <li>➤ Teach basics of switching, and routing and addressing</li> </ul>		
<b>Learning Outcomes</b>		
When this course has been completed the student should be able to		Assesment.
1	have the basic knowledge of computer networking	1
2	Know the functions of layers in OSI and TCP/IP protocol stacks	1
3	Identify the factors affecting network performance	1
4	Have a basic understanding of multiple access, switching, bridging, and addressing	1
5	Have a basic understanding of Data-Link Layer Protocols	1
6	Desgin and Implement addressing in IP networks and subnets	1
7	Have a basic understanding of Routers and Routing Protocols	1
8	Identify the need for Connection-oriented and/or connectionless services provided by TCP/IP	1
9	Research and understand the new trends and emerging networking issues themselves during their future career	2,3,4
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	1
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	3
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	5
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	4
7	Ability to express their ideas and findings, in written and oral form	5
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	3
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3
10	To apply fundamental concepts of software design, database design, data processing and artificial intelligence in the modeling, designing, implementing, testing and deploying software solutions.	1
11	Ability to analyse and design hardware systems by applying the principles of embedded systems, microprocessors, computer networks, distributed systems and data communication.	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate 4: High, 5:Very High)		

<b>Course Contents</b>			
Week			Exams
1	Chapter 1	Introduction	
2		OSI Model	
3		TCP/IP Model	
4	Chapter 2	Data Link Layer Basics	
5		Ethernet Protocol	
6		Switching	
7			Midterm
8	Chapter 3	Network Layer Basics	
9		IP Addressing	
10		Routers and Routing Protocols	
11		Subnetting	
12	Chapter 4	Transport Layer Protocols	Quiz
13		Handshaking and windowing	
14		Application Layer	
15			Final
<b>Recommended Sources</b>			
<b>Textbook:</b> L. L. Peterson, B. S. Davie "Computer Networks: A Systems Approach", Morgan Kaufmann, 5 <sup>th</sup> Edition, 2012			
<b>Supplementary Material (s):</b> 1. T.Lammle, "Cisco Certified Network Associate Study Guide", Sybex, 5 <sup>th</sup> Edition, 2005 2. A. S. Tanenbaum, "Computer Networks", Prentice Hall, 4th Edition, 2003			
<b>Assessment</b>			
Attendance	10%	Less than 25% class attendance results in NG grade.	
Laboratory	-		
Midterm Exam	30%	Written Exam	
Quiz	20%	Written Exam	
Final Exam	40%	Written Exam	
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	3	45
Labs and Tutorials	-	-	-
Assignments	-	-	-
Project/Presentation/Report Writing	1	25	25
E-learning Activities	-	-	-
Quizzes	1	15	15
Midterm Examination	1	15	15
Final Examination	1	15	15
Self Study	15	4	60
Total Workload			175
Total Workload/30 (h)			5.83
ECTS Credit of the Course			6