GAU, Faculty of Engineering

Course Unit Title	Computer Networks
Course Unit Code	SEN212
Type of Course Unit	Technical Elective, Software Engineering Students
Level of Course Unit	4th Year BSc
National Credits	3
Number of ECTS Credits Allocated	6 ECTS
Theoretical (hour/week)	3
Practice (hour/week)	-
Laboratory (hour/week)	-
Year of Study	4
Semester when the course unit is delivered	7/8
Mode of Delivery	Face to Face
Language of Instruction	English
Prerequisities and co-requisities	-
Recommended Optional Programme Components	Basic bacground Computing and Boolean Algebra

Objectives of the Course:

- Introduce the fundamental concepts of computer networks.
- Teach the basic performance and network engineering concepts
- Overview the hardware/software, protocols and layers, OSI and TCP/IP reference models.
- Data link layer design issues including encoding, framing and multiple access.
- Teach basics of switching, and routing and addressing

Learning Outcomes

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

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	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)

Course Contents

Week			Exams
1	Chapter 1	Introdution	
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

Recommended Sources

Textbook:
L. L. Peterson, B. S. Davie "Computer Networks: A Systems Approach", Morgan Kaufmann, 5th Edition, 2012

Supplementary Material (s):
1. T.Lammle, "Cisco Certified Network Associate Study Guide", Sybex, 5th Edition, 2005
2. A. S. Tanenbaum, "Computer Networks", Prentice Hall, 4th Edition, 2003

Assessment

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%	

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	-	-	-
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