

University of Asia Pacific (UAP)
Department of Electrical and Electronics Engineering (EEE)

Course Outline

Program:	Electrical and Electronics Engineering (EEE)
Course Title:	Computer Networks
Course Code:	CSE 447
Semester:	Spring-2018
Level:	8th Semester
Credit Hour:	3.0
Name & Designation of Teacher:	Md Akhtaruzzaman Adnan, Assistant Professor
Office/Room:	7th Floor, teacher's compound
Class Hours:	Sunday: 08:00 a.m. -09:30 a.m.; Thursday: 15.30-16.50 p.m.
Consultation Hours:	Sunday : 11:00 am -02:30 p.m.
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Rationale:	Required course and this knowledge is very important for the field of ISP and Networking professional.
Pre-requisite (if any):	Basic Computer and Networking Knowledge

Course Synopsis::

Introduction, History of Networking, Basic Computer Networks, Networking Devices, Different Servers, Networking Terminologies and their Introduction, Industry Overview of Networking, How Different Networks Work, Network Model, Network Topology, Network Architecture, IP Overview, IPv4, IPv6, Transition from IPv4 to IPv6, Subnet, Routing, Switching, IP in Detail, Subnetting in Detail, Transmission Media, Error Detection & Correction Schemes and Implementation of those Schemes, Routing Protocol: Static, OSPF, RIP, BGP, Servers in Detail,

IP in more Detail, ATM Network, IPv6 Facilities, VoIP, Security Issues in Networking, Different Security Protocols, Hacking, Ethical Hacking, Encryption, VPN, IPSec, Firewall, SSL, Wireless Sensor Network, Cloud Network, NFC Grid Network, More Detail about Cloud Network, Ad-hoc Networks, Servers: DNS-Mail-Proxy-DHCP.

Course Objectives (CO):

The objectives of this course are:

1. To **provide** knowledge and understanding on principles of data communication system, data communication technology and its applications.
2. To **introduce** the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
3. To **Learn** the fundamental concepts of computer networking
4. To **enable** the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.
5. To **emphasize** the student with the basic taxonomy and terminology of the computer networking area.

Learning Outcomes (LO):

Upon completion of the course, the students will be able to:

LO 1: **Describe** the concept of data communication and various data communication protocols.

LO 2: **Recognize** the concept of data encoding and responsibility of OSI and TCP/IP layers.

LO 3: **Understand** the different types of data communication operation and flow control and IP addressing.

LO 4: **Use** of different types of transmission media and network devices

LO 5: **Analyze the** error detection and correction in transmission of data.

LO 6: **Apply** data communication and modulation techniques.

Teaching-learning and Assessment Strategy: Lectures, assignments, quizzes, exams

Linkage of LO with Assessment Methods & their Weights:

LO	Assessment Method	(%)
1 – 3	Quiz	10
1 – 6	Class attendance	10
4,5,6	Assignment	10
1– 4	Midterm Exam	20
1 – 6	Final Exam	50

Minimum attendance: 70% class attendance is mandatory for a student in order to appear at the final examination.

Mapping of Course LO and Generic Skills:

Learning Outcome (LO) of the Course	Generic Skills* (Appendix-1)											
	1	2	3	4	5	6	7	8	9	10	11	12
LO 1: Describe the concept of data communication and various data communication protocols.												
LO 2: Recognize the concept of data encoding and responsibility of OSI and TCP/IP layers.												
LO 3: Understand the different types of data communication operation and flow control.												
LO 4: Use of different types of transmission media and network devices												
LO 5: Analyze the error detection and correction in transmission of data.												
LO 6: Apply data communication and modulation techniques.												

Reference text(s):

TCP/IP: Protocol Suite -Behrouz A. Forouzan

Additional reading material: PowerPoint slides & PDF provided by the teacher

Lecture Plan:

Lecture	Topic	<u>Reading Materials</u>	Work assignment
Week 1	Introduction, History of Networking	Text Book	
	Basic Computer Networks, Networking Devices, Servers		
Week 2	Basic Computer Networks, Networking Terminologies and their Introduction,	PowerPoint slides, Text Book	
	Industry Overview of Networking		
Week 3	How Different Networks Work, Network Model	Text Book	
	Network Topology, Network Architecture		
Week 4	IP Overview, IPv4, IPv6,	Powerpoint slides & PDF given in the class	
	Transition from IPv4 to IPv6, Subnet, Routing, Switching	Powerpoint slides & PDF given in the class	
Week 5	IP in Detail, Subnetting in Detail, Transmission Media	Text Book	
Week 6	Continuation of week 5	Text Book	
Week 7	Error Detection & Correction Schemes and Implementation of those Schemes	Text Book	
	Continuation of week 7		
Mid-term Exam			
Week 8	Servers: DNS-Mail-Proxy-DHCP, Firewalls	Text Book	
Week 9	ISP-IIG-IGW-ICX-ITC-SMC Configuration and Design Concept	Text Book	
	Routing Protocol: Static, OSPF, BGP		
Week 10	Servers in Detail, IP in more Detail, ATM Network, IPv6 Facilities, VoIP	Text Book	

Week 11	Security Issues in Networking	Text Book	
	Different Security Protocols, Hacking, Ethical Hacking, Encryption		
	VPN, IPSec, Firewall, SSL		
Week 12	Wireless Sensor Network,	Text Book	Quiz 4
	Cloud Network, Grid Network		
Week 13	More Detail about Cloud Network	Text Book	
	Ad-hoc Networks		
Week 14	Overview , Semester-Final Preparation		

Required References: William Stallings, Data and Computer Communications, Published by Pearson, 8th Edition.

Recommended References: Behrouz A. Forouzan, Data Communications and Networking, *McGraw Hill*, 4th Edition.

Grading System: As per the approved grading scale of University of Asia Pacific (Appendix-2).

Student's responsibilities: Students must come to the class prepared for the course material covered in the previous class (es). They must submit their assignments on time. No late or partial assignments will be acceptable. There will be no make-up quizzes.

Appendix-1: Generic Skills

No.	Generic Skills
1.	Engineering Knowledge
2.	Problem Analysis
3.	Design/Development of Solutions
4.	Investigation
5.	Modern Tool Usage
6.	The Engineer and Society
7.	Environment and Sustainability
8.	Ethics
9.	Communication
10.	Individual and Team Work
11.	Life Long Learning
12.	Project Management and Finance

Generic Skills (Detailed):

1. **Engineering Knowledge (T)** -Apply knowledge of mathematics, sciences, engineering fundamentals and manufacturing engineering to the solution of complex engineering problems;
2. **Problem Analysis (T)** – Identify, formulate, research relevant literature and analyze complex engineering problems, and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences;
3. **Design/Development of Solutions (A)** –Design solutions, exhibiting innovativeness, for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues.
4. **Investigation (D)** Conduct investigation into complex problems, displaying creativeness, using research-based knowledge, and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions;
5. **Modern Tool Usage (A & D)** -Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations;
6. **The Engineer and Society (ESSE)** -Apply reasoning based on contextual knowledge to assess societal, health, safety, legal, cultural, contemporary issues, and the consequent responsibilities relevant to professional engineering practices.
7. **Environment and Sustainability (ESSE)** -Understand the impact of professional engineering solutions in societal, global, and environmental contexts and demonstrate knowledge of and need for sustainable development;
8. **Ethics (ESSE)** –Apply professional ethics with Islamic values and commit to responsibilities and norms of professional engineering code of practices.
9. **Communication (S)** -Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
10. **Individual and Team Work (S)** -Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
11. **Life Long Learning (S)** -Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
12. **Project Management and Finance (S)** -Demonstrate knowledge and understanding of engineering management and financial principles and apply these to one’s own work, as a member and/or leader in a team, to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship.

Appendix-2: Grading Policy

Numeric Grade	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	D	2.00
Less than 40%	F	0.00

Prepared by:

Checked by:

Approved by:
(Head of the Detp.)
