

LECTURER GUIDANCE and DETAIL DESCRIPTION

Subject : Data Communications
Code Number : TIF207
Program : S1 - Informatics Engineering
Credit Semester : 3 (Three)
Revision : 2 / 14-04-2016
Academic Year : (Odd)– 2016/2017

Studying and Learning Process

- a. The lecturers : Explain, give examples, discuss, give assignment / homework
b. The students : Listen, study, active in discussion and do the assignment / homework
c. The Lab Assistant : Help students with the configuration problems in the lab

Learning and Teaching Guidance for General Objective

- 1 Brainstorming
2 Evaluation
3 Lab Assignment & Submission

Types of delivery the Specific Objectives

- 1 Introduction
2 Concept
3 Exercises and hands-on practices
4 Discussion
5 Conclusion

Media
a. LCD Projector
b. Glass Board
c. Text Books
d. Handout
e. Note book/ PC

Evaluation
a. Mid-Term Test (UTS) = 30%
b. Final Test (UAS) = 40%
c. Class Review Questions and Lab Assignment = 30%

Main Reference
: [Main Text Book]
[1] Behrouz Forouzan, “Data Communications and Networking”, Fourth Edition, McGraw Hill International, 2007
: [Supporting Reference]
[2] Andrew S. Tanenbaum, “Computer Networks”, Third Edition, Prentice Hall International, 1996
[3] William Stallings, “Data and Computer Communications”, Fifth Edition, Prentice Hall International, 1997
[4] Douglas E. Comer, “Internetworking with TCP/IP Volume I: Principles, Protocols, and Architecture”, Third Edition, Prentice Hall International, 1995
[5] Douglas E. Comer and David L. Stevens, “Internetworking with TCP/IP Volume II: Design, Implementation, and Internals”, Secodn Edition, Prentice Hall International, 1996

Internals : Second Edition, Prentice Hall International, 1998							
Session	General Objective (GO)	No	Specific Objective (SO)	Directions			
				Focus of delivery	Exercise	Level of Difficulty	Lecture's Remarks
Introduction to Data Communications							
I	Review the data communication terminology, areas, history and techniques, architecture.		Introduction to Data Communications	Introduction	1	Easy	[2] ch.1, [1] ch.1
		1	Introduction to Data Communications	Concept & Discussion	1.1	Easy	[2] ch.1, [1] ch.1
		2	Historical review of Computer Networking	Concept & Discussion	1.2	Medium	[2] ch.1
		3	Computer Networking Hardware	Concept & Discussion	1.3	Easy	[2] ch.1.2
		4	Computer Networking Software	Concept & Discussion	1.4	Easy	[2] ch.1.3
		5	Network Architecture	Concept & Discussion	1.5	Medium	[1] ch.1

Session	General Objective (GO)	No	Specific Objective (SO)	Directions			
				Focus of delivery	Exercise	Level of Difficulty	Lecture's Remarks
Fundamental of Communications							
II	Review the fundamental of communications, standardisation, topologies and packet, switched circuit.	1	Fundamental of Communication	Concept & Discussion	2.1	Medium	[2] ch.2.1
		2	Reference Model	Concept & Discussion	2.2	Medium	[2] ch.1.4, [1] ch. 2
		3	Standardisation	Concept & Discussion	2.3	Hard	[2] ch.6, [1] ch.1
		4	Network Topologies	Concept & Discussion	2.4	Medium	[1] ch.1
		5	Data Communication Basics	Concept & Discussion	2.5	Easy	[2] ch.2.1
		6	Packet-based Data Communication	Concept & Discussion	2.6	Hard	[2] ch.5.1.1
		7	Circuit-switched vs Packet-switched	Concept & Discussion	2.7	Medium	[1] ch.8.1
		8	Message switching datagram, virtual circuit	Concept & Discussion	2.8	Easy	[2] ch.5.1.1, 5.1.3, 5.1.4
		9	Connection vs Connectionless oriented	Concept & Discussion	2.9	Medium	[2] ch.5.1.3, 5.1.4

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Wired Based Communication							
III	Continue to review the wired communication, wireless communication, communication network	1	Wired-based Communications	Concept & Discussion	3.1	Medium	[1] ch.7.1
		2	Wireless Communication	Concept & Discussion	3.2	Hard	[1] ch.7.2
		3	Examples of Communication Networks	Concept & Discussion	3.3	Medium	

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Data Link Layer Basics							
IV	Continue to review the Data Link Layer Basics, Encoding and Framing, Error Detection, Sliding Windows	1	Data Link Layer Basics	Concept & Discussion	4.1	Medium	[2] ch.3
		2	Encoding, Framing	Concept & Discussion	4.2	Medium	[1] ch.4.1, 4.2, [2] ch.3.1.2
		3	Error Detection, error correction, reliable transmission	Concept & Discussion	4.3	Hard	[2] ch.3.2, [1] ch.10, 10.2
		4	Sliding Windows	Concept & Discussion	4.4	Medium	[2] ch.3.4

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Channel Allocation							
V	Continue to review the channel allocation, multiple access protocols, ethernet	1	Channel Allocation	Concept & Discussion	5.1	Easy	
		2	Multiple Access Protocols	Concept & Discussion	5.2	Medium	[2] ch.4.2, [1] ch.12.1
		3	Ethernet	Concept & Discussion	5.3	Medium	[2] ch.4.3

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Network Layer							
VI	Review the network layer, addressing, IPv4 and IPv6, routing algorithm	1	Network Layer	Concept & Discussion	6.1	Medium	[1] ch.19, 20, 21, 22
		2	Network Layer Addressing	Concept & Discussion	6.2	Easy	[2] ch.5.6.2, [1] ch.19.1, 19.2, 21.1
		3	IPv4 and IPv6	Concept & Discussion	6.3	Medium	[2] ch.5.6.1, 5.6.2 [1] ch.19.1, ch.20.2
		4	Routing Algorithm	Concept & Discussion	6.4	Hard	[2] ch.5.1.1, [1] ch.22.3, 22.4

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Spanning Tree and intra/interdomain routing protocols							
VII	Continue to Review the spanning tree, intra/inter-domain routing protocols, CIDR	1	Spanning Tree	Concept & Discussion	7.1	Medium	[2] ch.5.2.7
		2	Intra/inter-domain routing protocols	Concept & Discussion	7.2	Medium	[1] ch.22.3
		3	CIDR	Concept & Discussion	7.3	Hard	[2] ch.5.6.2

MID SEMESTER TEST

Session	General Objective (GO)	No	Specific Objective (SO)	Directions			
				Focus of delivery	Exercise	Level of Difficulty	Lecture's Remarks
Internet Protocol and Quality of Services							
VIII	Review the principles of internet protocols, quality of services and congestion control	1	Internet Protocol (IP)	Concept & Discussion	8.1	Medium	
		2	Quality of Services	Concept & Discussion	8.2	Medium	[2] ch.5.4 [1] ch.24.5, 24.6, 24.9
		3	Congestion Control	Concept & Discussion	8.3	Hard	

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End to end protocol, data presentation							
IX	Review the End to end protocol, data presentation and compression	1	End to end protocol	Concept & Discussion	9.1	Hard	
		2	Data presentation	Concept & Discussion	9.2	Medium	[1] ch.1, 29.1
		3	Compresion	Concept & Discussion	9.3	Medium	[2] ch.7.4.2 [1] ch.29.2

Session	General Objective (GO)	No	Specific Objective (SO)	Directions			
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Transport services and protocol							
X	Review the Transport services, and its protocol	1	Transport services	Concept & Discussion	10.1	Hard	
		2	Transport protocol	Concept & Discussion	10.2	Medium	[2] ch.6 , [1] ch.23

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UDP, TCP and Performance Issues							
XI	Review the UDP, TCP and performance issues.	1	UDP	Concept & Discussion	11.1	Hard	[2] ch. 6.4, [1] ch.23.2
		2	TCP	Concept & Discussion	11.2	Medium	[2] ch.6.5, [1] ch.23.2, 23.4
		3	Performance issues	Concept & Discussion	11.3	Medium	[2] ch.6.6

Session	General Objective (GO)	No	Specific Objective (SO)	Directions			
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Application Services (DNS, e-mail, www)							
XII	Review the DNS, E-mail, WWW, Multimedia and Streaming application services.	1	DNS	Concept & Discussion	12.1	Hard	[2] ch.7.1, [1] ch.25
		2	Email	Concept & Discussion	12.2	Medium	[2] ch.7.2, [1] ch.26.2
		3	WWW	Concept & Discussion	12.3	Hard	[2] ch.7.3 [1] ch.27.1, 27.2
		4	Multimedia	Concept & Discussion	12.4	Medium	[2] ch.7.4, [1] ch.29.1
		5	Streaming	Concept & Discussion	12.5	Medium	[2] ch.7.4.3, [1] ch.29.3, 29.4

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Wireless and Wimax							
XIII	Review the wireless networking, security, wireless broadband, wimax	1	Wireless networking	Concept & Discussion	13.1	Medium	[2] Ch.4.4
		2	Security	Concept & Discussion	13.2	Medium	[2] ch.8.6.4
		3	Wireless broadband	Concept & Discussion	13.3	Hard	[2] ch.4.5
		4	WIMAX	Concept & Discussion	13.4	Medium	

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Network and Internet Security							
XIV	Review the Network and Security	1	Network Security Basic	Concept & Discussion	14.1	Medium	[2] ch.8, [1] ch.31
		2	Cryptography	Concept & Discussion	14.2	Hard	[2] ch.8.1, [1] ch.30
		3	Symmetric Key Algorithm	Concept & Discussion	14.3	Hard	[2] ch.8.2, [1] ch.30.2
		4	Public Key Infrastructure	Concept & Discussion	14.4	Medium	[2] ch.8.3, [1] ch.31.7
		5	Internet Security	Concept & Discussion	14.5	Medium	[1] ch. 32
		6	IPSec	Concept & Discussion	14.6	Hard	[1] ch.32.1
		7	PGP	Concept & Discussion	14.7	Hard	[1] ch.32.3
		8	Firewalls	Concept & Discussion	14.8	Medium	[1] ch.32.4

FINAL SEMESTER TEST