



Course Specification

Course Name:[Computer Networks-1]

Course Code:[IT222]

I. Basic Course Information

Major or minor element of program:[General]

Department offering the course:[Information Technology Department]

Academic level:[200 level]

Semester in which course is offered:[Second (spring) Semester]

Course pre-requisite(s): [Data Communication (IT221)]

Credit Hours: 3

Contact Hours Through:

Lecture	Tutorial*	Practical*	Total
2.5	1.5	0.0	4.0

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification:[January 2015]

II. Overall Aims of Course

[This course focuses on the main concepts of computer networks and associated communication environment. It provides students with fundamental knowledge of various network types and switching techniques. It helps them differentiate between different network topologies and architectures, and their relevance to data transmission systems. In addition, it introduces students to multiple routing and flow control protocols, as well as congestion control strategies. It also familiarizes them with the main principles of security and internetworking.]

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K1,K2,K6,K10]	[I2,I3,I4,I6]	[P1,P3,P7,P9]	[G1,G2,G5,G7]



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IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

- K.1 Recognize the essential technology underlying all forms of LANs, comprising topology and transmission media.
- K.2 Recognize underlying technology and architecture of circuit-switching and packet-switching networks.
- K.3 Define fundamental concepts and principles of routing, flow control, and congestion control in data networks.
- K.4 Describe the design factors encountered in current and future development of data networks.
- K.5 Define Internetworking basics and protocols.
- K.6 Define and classify interconnecting devices.
- K.7 List data and criteria affecting the overall performance of computer networks.
- K.8 Recognizing the fundamental concepts and issues associated with modelling computer networks in terms of both quality and security.]

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 Differentiate between various network topologies.
- I.2 Formulate a clear distinction between circuit-switching and packet-switching techniques as well as the pros and cons of using each.
- I.3 Develop and defend logical arguments for the selection of a specific topology in a particular network scenario.
- I.4 Design computer network topology for a given set of requirements.
- I.5 Design a variety of computer networking configuration taking into account the industrial and commercial restraints and network security issues.
- I.6 Setup congestion and flow control strategies and plan optimal routes for computer networks taking into consideration the limitations, quality constraints, and trade-offs between different performance criteria.
- I.7 Assess and carry out performance analysis, critical appraisals and evaluation of computer networks and their security requirements.
- I.8 Setup and evaluate appropriate tools, cables and interconnecting devices for the design and implementation of internetworking.]

c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 Apply appropriate scientific, mathematical, and technical methods to solve problems related to computer networking and security.
- P.2 Execute procedures involved in different routing algorithms to measure the quality and safety of the routes obtained.
- P.3 Employ network simulators and network analyser for computing practice.
- P.4 Select appropriate cabling and interconnecting equipments to build networks and resolve problems.]

d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 Work coherently and effectively within a multidisciplinary team.
- G.2 Show the ability to identify and approach networking problems systematically.
- G.3 Use different external resources to acquire knowledge and information.
- G.4 Demonstrate efficient use of IT resources and computing facilities to solve practical problems.]



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V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	[Local Area Network Overview]	[2]	[K1,K4,K7,K8]	[I1,I3,I4,I5]	[P1]	[G2,G4]
2-	[Circuit Switching and Packet Switching]	[2]	[K2,K4,K8]	[I2]	[P1]	[G1,G2,G4]
3-	[Routing in Switched Networks]	[2]	[K3,K4,K7,K8]	[I6,I7]	[P2]	[G2,G3,G4]
4-	[Congestion in Switched Data Networks]	[2]	[K3,K4,K7,K8]	[I6,I7]	[P1]	[G2,G4]
5-	[Internetwork Protocols]	[1]	[K5,K6]	[I5,I7]	[P1]	[G2]
6-	[Internetwork Operation]	[1]	[K7,K8]	[I8]	[P4]	[G4]
7-	[Network Security]	[2]	[K4,K7,K8]	[I5,I7]	[P1,P3]	[G1,G2,G3,G4]
8-	[Flow Control]	[1]	[K3,K4,K7,K8]	[I6,I7]	[P1]	[G1,G2,G3,G4]
	Net Teaching Weeks	13				

VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours*
1	[Network Types]	2.5	2.5	
2	[Topologies and Transmission Media]	4	2.5	1.5
3	[Circuit Switching Networks]	4	2.5	1.5
4	[Packet Switching Networks]	4	2.5	1.5
5	[Routing Strategies]	4	2.5	1.5
6	[Least-Cost Algorithms]	4	2.5	1.5
7	Midterm Exam			
8	[Effects of Congestion]	4	2.5	1.5
9	[Congestion Control Strategies]	4	2.5	1.5
10	[Interconnecting Devices]	4	2.5	1.5
11	[Internetworking Operation]	4	2.5	1.5
12	[Security Attacks]	4	2.5	1.5
13	[Encryption and Authentication]	4	2.5	1.5
14	[Flow Control Strategies]	4	2.5	1.5
15	Final Exam			
Total Teaching Hours		51	33	18

* No Practical/Tutorial during the first week of the semester



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VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	Intellectual Skills	Professional Skills	General Skills
Lectures & Seminars	<input checked="" type="checkbox"/>	[K1 - K8]	[I1 - I8]	[P1, P2]	[G1- G4]
Tutorials	<input checked="" type="checkbox"/>	[K1 - K8]	[I1 - I8]	[P1 - P5]	[G2- G4]
Computer lab Sessions	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]
Practical lab Work	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]
Reading Materials	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]
Web-site Searches	<input checked="" type="checkbox"/>	[K3,K4,K8]	[I4,I5,I7,I8]	[P3, P4]	[G3,G4]
Research & Reporting	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]
Problem Solving / Problem-based Learning	<input checked="" type="checkbox"/>	[K7]	[I1 - I8]	[P1 -P5]	[G2]
Projects	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]
Independent Work	<input checked="" type="checkbox"/>	[K1 - K7]	I1,I2,I3,I6,I7	[P1,P2]	[G2]
Group Work	<input checked="" type="checkbox"/>	[K8]	[I4,I5]	[P3,P4,P5]	[G1,G3,G4]
Case Studies	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]
Presentations	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]
Simulation Analysis	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]
Others (Specify):	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]

VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	I.S.	P.S.	G.S.		
Midterm Exam	<input checked="" type="checkbox"/>	[K1, K2, K3]	[I1,I2,I3,I6]	[P1, P2]	[G2]	[20 %]	7
Final Exam	<input checked="" type="checkbox"/>	K1 - K8	[I1 - I8]	P1, P2	[G2]	60%	15
Quizzes	<input checked="" type="checkbox"/>	K1 - K7	[I1,I2,I3,I6,I8]	P1, P2	[G2]	[10%]	[8, 12]
Course Work	<input checked="" type="checkbox"/>	K1 - K7	[I1,I2,I3,I6,I8]	P1 - P5	[G1 - G4]	[10%]	[8, 12]
Report Writing	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]	[[]]	[[]]
Case Study Analysis	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]	[[]]	[[]]
Oral Presentations	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]	[[]]	[[]]
Practical	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]	[[]]	[[]]
Group Project	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]	[[]]	[[]]
Individual Project	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]	[[]]	[[]]
Others (Specify):	<input type="checkbox"/>	[[]]	[[]]	[[]]	[[]]	[[]]	[[]]



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IX. List of References

Essential Text Books	•	William Stallings. Data and Computer Communications.
Course notes	•	None
Recommended books	•	None
Periodicals, Web sites, etc ...	•	None

X. Facilities required for teaching and learning

[List the facilities required • Data Show • White Board]

Course coordinator:[Dr. Amira Kotb & Dr. Eman Sanad]

Head of Department: Prof. Hesham El Mahdy

Date:[January 2015]]