Computer Networks Course Specifications

Faculty: Computer Information

Department: Computer Science

Course Specifications

Program(s) on which the course is given   : Bachelor in Computer and Information Sciences

Major or Minor element of programs   : Computer Systems, Computer Science

Department offering the program   : Computer Science

Department responsible for the course   : Computer Systems

Academic year / Level   : 4th year/B.Sc.

Date of specification approval   : Dec. 2009

A. Basic Information

Title: Computer Networks   **Code:**   CHW 465

Lecture: 3 hrs/week   **Practical:** 2 hrs/week   **Tutorial: ---**

Total: 5 hrs/week

B. Professional Information

1. Overall Aims of Course:

The course provides a broad introduction to data communications systems and modern computer networks and their applications, with specific emphasis on the protocols and devices involved and how they inter-work. At the end of the course students should have general knowledge on how the Internet works and have basic network programming skills.

The main aims of the course are:

- To introduce the fundamental concepts and theory of data communications

- To provide a solid understanding of the technologies that support modern networked computer systems

- To introduce low-level network programming concepts

- To give students the ability to evaluate and advise industry on the use and deployment of networked systems.

2. Intended Learning Outcomes of Course (ILOs):

At the end of this course, the student is expected to be able to:

A- Knowledge and Understanding :

A1) Basic theories of data transmission

A2) OSI and TCP/IP Architecture.

A3) Network Protocols : Transmission and Routing Protocols

A4) Physical layer characteristics and serial bit transmission

A5) Switching Techniques : Circuit Switching and Packet Switching

A6) Internetworking

A7) NAT technology

B- Intellectual Skills :

 B1) Distinguish between Data Link Protocols and physical Layer protocols

B2) Analyze and compare data link layer transmission and physical transmission

B3) Analyze and compare the different transmission modes and error checking protocols.

 B4) Analyze and compare the different routing strategies.

B5) Analyze and compare the different congestion control and flow control methods.

B6) Analyze and compare the different LAN topologies and protocols.

C) Subject Specific Skills :

C1) Learn the physical Layer encoding techniques.

C2) Learn error checking codes.

C3) Learn the Data Link Protocols

C4) Learn the Routing Protocols

d) Transferable Skills :

d1. Discuss the different cable types that are used at the physical   Layer.

d2. Discuss the optimum network set-up in terms of the choice of internetworking devices and the appropriate protocols to use.

d3. Work effectively as a part of a team to apply skills gained throughout the course to build and configure a complex network and to produce reports and presentations

e) Attitude

e1- A knowledge and respect of ethics and ethical standards in relation to a major area of study.

e2- Explain the nature of privacy and how it is protected by the Data Protection.

Course Contents:

Topic	No. of hours	Lecture	Tutorial/ Practical
Introduction	6	4	2
Network Models : OSI and Internet	5	3	2
Data and Signals	8	5	3
Analog-to-analog Conversion	2.5	1.5	1
Transmission Media	2.5	1.5	1
Multiplexing, Switching, and Using Telephone and Cable Networks for Data Transmission	7	4	3
Error detection and Correction	4.5	2.5	2
Data Link Control	5	2.5	2.5
Ethernet and Multiple Access	4.5	3	1.5
Connecting LANs, Backbone Networks, and VLANs	5.5	3	2.5
Network Layer : IPv4,	3	2	1
Network Layer : Address Mapping, Error Reporting, Delivery, Forwarding, and Routing	9	6	3
Transport Layer : Process-to-Process Delivery, UDP, TCP	5.5	3.5	2
Application Layer : DNS	1	0.5	0.5