



## Course Outline

**Course** CS 252- Computer Communications & Networks

**Credit Hours** 3-1-4

**Course Instructor** Syed Shabbar Raza Zaidi

**Lab Instructor** Syed Shabbar Raza Zaidi

**Pre-requisite** Programming Experience in C++ or Python

**Year** 2017(Fall)

**Semester** V

**Email** [shabbar.raza@aumc.edu.pk](mailto:shabbar.raza@aumc.edu.pk)

**Email** [shabbar.raza@aumc.edu.pk](mailto:shabbar.raza@aumc.edu.pk)

### Text Book(s):

“Computer Networking: A Top-Down Approach” (6th edition) by Jim Kurose and Keith Ross. Addison Wesley, 2012

### Reference Book(s):

“Computer Networks” by Andrew S. Tanenbaum.

“CCNA Routing and Switching Complete Study Guide” (2nd Edition) by Todd Lammle

Further reference material shall be provided as the course proceeds.

### Objectives:

The objective of this course is to introduce the principles and practices of Computer Networking, specifically focusing on the Internet. By the end of the course, students should be able to:

- Understand the anatomy of the Internet
- Understand the design of networking stack
- Implement networking concepts on CISCO devices

### Grading and General Course Policies:

The general breakdown is as follows:

**Final Exam: 45%**

**Midterm: 25%**

**Quizzes: (4) 10%**

**Assignments: (4) 10%**

**Class Participation/LAB work: 10%**

3 hour LAB test will be performed at the end of semester.

Assignments after due date will not be accepted.

No make-up test or quiz will be given.

## **Lecture Plan:**

*Week 1 to 2:*

*Introduction and Overview:*

- *Basic Concept of Networking*
- *Network Edge*
- *Network Core*
- *Network Delays, OSI and TCP/IP Layers Model*

*Week 3 to 4:*

*Application Layer*

- *Principles of Network Applications*
- *The Web and HTTP*
- *FTP*
- *Electronic Mail*
- *DNS*
- *P2P*
- *Socket Programming: Designing our own Client & Server*

*Week 5 to 7:*

*Transport Layer*

- *Multiplexing and Demultiplexing*
- *User Datagram Protocol UDP*
- *Reliable Data Transfer RDT*
- *Transmission Control Protocol TCP*

*Week 8:*

*Mid Term Exam*

*Week 9 to 12:*

*Network Layer*

- *IPv4 addressing*
- *IPv4 header*
- *IPv4 vs IPv6*
- *IPv4 Subnetting, VLSM*
- *IP Routing Algorithms*
- *Routing in the Internet: RIP, EIGRP, OSPF, BGP*
- *Multicasting and Broadcasting*
- *NAT*

*Week 13:*

*Physical and Link Layer:*

- *Introduction to Link Layer*
- *Error Detection and Correction Techniques*
- *Switched Local Area Networks*
- *Broadcast and Collision Domains, VLANs*
- *Spanning Tree Protocol*

*Week 14 to 15:*

*Security and Monitoring:*

- *SNMP Protocol*
- *Solarwinds Monitoring*
- *Confidentiality, Integrity and Availability*
- *Principles of Cryptography*
- *Message Integrity and Digital Signatures*
- *End Point Authentication*
- *L3 and L2 Securities implementation on devices.*
- *IP Sec*