



Faculty of Computer Studies (FoCS)

Course Name: Fundamentals of Computer Networking

(UG/PG): PG

Number of Credits: 03

Level: 3

Learning Objective(s):

The course

- provides an introduction to fundamental concepts in computer networking, their protocols, and applications.
- Includes discussions on network architectures, applications, network programming interfaces (e.g., sockets), transport, congestion, routing, and data link protocols, addressing, local area networks, wireless networks.

Pedagogy:

- Lectures
- Class work discussion
- Case studies
- Video sessions
- Presentations
- Research by students

Pre-learning:

- Programming
- Knowledge of Computer Fundamental

Course Content

Session	Topic	Hours
1	Introduction: Internet –Protocol - The Network Edge: Access Networks and Physical Media - Network Core: Packet Switching and Circuit Switching - Delay, Loss and throughput in Packet-Switched Networks - Protocol Layers and Their Service Models - A Brief History of Computer Networking and the Internet.	6
2	Application Layer: Principles of Network Application - Layer Protocols - The World Wide Web: HTTP - File Transfer: FTP - Electronic Mail in the Internet - The Internet's Directory Service: DNS - Peer-peer Applications - Socket Programming.	8
3	Transport Layer: Transport Layer Services - Multiplexing and Demultiplexing - Connectionless Transport: UDP - Principles of Reliable of Data Transfer – Connection-Oriented Transport: TCP - Principles of Congestion Control - TCP Congestion Control.	7
4	Network Layer: Introduction: Forwarding and Routing - Network Service Models - Virtual Circuit and Datagram Networks – Inside a Router - The Internet Protocol (IP): Forwarding and Addressing in the Internet – Routing Algorithms - Routing in the Internet - Broadcast and Multicast Routing.	8
5	Link Layer and Local Area Networks: Introduction to Link Layer - Error-Detection and -Correction Techniques - Multiple Access Links and Protocols - Switched Local Area Networks - Link Virtualization: A Network as a Link Layer - Data Center Networking.	8
6	Wireless and Mobile Networks: Introduction - Wireless Links and Network Characteristics - WiFi: 802.11 Wireless LANs - Cellular Internet Access - Mobility Management: Principles - Mobile IP - Managing Mobility in Cellular Networks - Wireless and Mobility: Impact on Higher-Layer Protocols.	8
	Total	45

Books Recommended

- 1) Computing Networking: A Top Down Approach, 7th edition (2017), J.F. Kurose & K.W. Ross. Published by Pearson/Addison-Wesley
- 2) Understanding the Network: A Practical Guide to Internetworking By: Martin J. Michael Publisher: Sams
- 3) Internetworking with TCP/IP - Douglas Comer
Academic year 2019-20

- 4) Microsoft Press – MCSE/MCITP books
- 5) CWNA: Certified Wireless Network Administrator Official Study Guide, David D. Coleman; David A. Westcott Publisher: Sybex
- 6) Building a Cisco Wireless Lan : Syngress

Suggested Evaluation Methods:

- 1) Moodle Based Examination
- 2) Open Book Written Examination
- 3) Research Based Assignments
- 4) Group Projects and Presentation
- 5) Viva Voce

Parallel/Similar courses the existing curriculum:

S.No.	Name of the course	Institute where it was offered
1	Computer Networks	Ryerson University Canada
2	Computer Communication and Networking	Florida International University
3	Computer Hardware and Network Administration	Pune University
4	Network Essentials	SICSR
5	Advanced Networks	SICSR

Name of Member	Prof. Harshad Gune	Dr. Naganathan Rengasari	Prof. Priti Kulkarni		
Designation	Dy. Director & Associate Professor	Professor	Assistant Professor		
Org. / Inst.	SICSR	SICSR	SICSR		
Signature					

Name of the Experts:

Signature:

Date:

Academic year 2019-20

M Sc SS