

**DEPARTMENT OF COMPUTER SCIENCE,
RABINDRANATH THAKUR VISHWAVIDYALAYA, HOJAI: ASSAM**
Computer Science Syllabus for UG courses, according to NEP2020 (CBCS)

Subject details For Fifth Semester(Minor):

<i>Class</i>	<i>Courses</i>	<i>Subject papers</i>	<i>Credits</i>
SEM-V	CORE (MIN-CSC-5.1)	Computer Networking	3 1
			Total credit:4
SEM-V	CORE (MIN-CSC-5.2)	OPERATING SYSTEMS AND NETWORK MANAGEMENT	3 1
			Total Credit:4

SEMESTER-V

CORE COURSE

MIN – CSC- 5.1 (COMPUTER NETWORKING)

Total marks: 100 (Theory: 45, Internal Assessment: 25, Practical: 30)

Total credit: 4 (L-3,P-1,T-4),

Total marks: 100 -- (Theory: 45, Internal Assessment: 30, Practical 25) Total credit: 4 (L-3, P-1, T-4)

1. Course objectives:

- At the end of the course, students will be able to:
- Understanding the basics concepts and principles of computer networks.
- Explain the OSI and TCP/IP reference models.
- Study the various transmission media and data communication techniques.
- Develop an understanding of network security.

2. Perquisite : NIL

3. Semester: 5

4. Course Level : 100 – 199

5. Theory Credit :3

6. Practical Credit :1

7. Number of required hours :

- a) Theory : 45 hours**
- b) Practical : 30 hours**
- c) Non-Contact : 5 hours**

UNIT 1: Basic concepts (6 Lectures Prac: 5)

Components of data communication, standards and organizations, Network Classification, Network Topologies ; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

UNIT 2: Physical Layer (6 Lectures Prac: 5)

Cabling, Network Interface Card, Transmission Media Devices- Repeater, Hub, Bridge, Switch, Router, Gateway.

UNIT 3: Data Link Layer (6 Lectures Prac: 5)

Framing techniques; Error Control; Flow Control Protocols; Shared media protocols - CSMA/CD and CSMA/CA.

UNIT 4: Network Layer (6 Lectures Prac: 5)

Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive)

UNIT 5: Transport Layer (5 Lectures)

Transport services, Transport Layer protocol of TCP and UDP

UNIT 6: Application Layer (6 Lectures Prac:5)

Application layer protocols and services – Domain name system, HTTP, WWW, telnet, FTP, SMTP

UNIT 7: Network Security (5 Lectures Prac: 3)

Common Terms, Firewalls, Virtual Private Networks

Lectures- 40 Tutorials – 07 Practical: 28 Total Hours : 75

REFERENCE BOOKS:

B.A. Forouzan: Data Communication and Networking, 4th Edition, Tata McGraw Hill, 2007.
D.E. Comer, Internetworking with TCP/IP, Vol. I, Prentice Hall of India, 1998.
W. Stalling, Data & Computer Communication, 8th edition, Prentice Hall of India, 2006.
D. Bertsekas, R. Gallager, Data Networks, 2nd edition, Prentice Hall of India, 1992.

SOFTWARE LAB BASED ON COMPUTER NETWORKS:

Implement the concepts of Computer Networks such as:

1. Simulate Checksum Algorithm.
2. Simulate CRC Algorithm
3. Simulate Stop & Wait Protocol.
4. Simulate Go-Back-N Protocol.
5. Simulate Selective Repeat Protocol.

SEMESTER-V

CORE COURSE

MIN – CSC- 5.2 (OPERATING SYSTEMS AND NETWORK MANAGEMENT)

Total marks: 100 (Theory: 45, Internal Assessment: 25, Practical: 30)

Total credit: 4 (L-3,P-1,T-4)

Total marks: 100 -- (Theory: 45, Internal Assessment: 30, Practical 25) Total credit: 4 (L-3, P-1, T-4)

1. COURSE OBJECTIVES:

- To introduce the concepts associated with operating system and their design considerations.
- To provide necessary tools for choosing operating system for certain environment.
- To understand the networking concepts.
- To expose the relationship between operating systems and computer networks.

2. **Perquisite** : NIL

3. **Semester**: 5

4. **Course Level** : 100 – 199

5. **Theory Credit** :3

6. **Practical Credit** :1

7. **Number of required hours** :

d) **Theory** : 45 hours

e) **Practical** : 30 hours

f) **Non-Contact** : 5 hours

UNIT:1 Introduction to Operating System : (8 Lectures Prac: 6)

Serial Processing, Batch Processing, Multiprogramming, Operating System Structure, Layered Structure Approach, Virtual Machine, Client-Server Model, Kernel Approach, Classification of Advanced Operating System, Characteristics of Modern Operating System, Microkernel Architecture, Multithreading, Symmetric Multiprocessing.

UNIT: 2 Introduction to Networking Concepts : (8 Lectures Prac: 6)

Reference models, network topologies, types of network, transmission media, IP addressing, internetworking devices, media access control.

UNIT: 3 Linux Operating System: (8 Lectures Prac: 6)

Features of Linux, components of Linux, Memory Management subsystems Linux Process and Thread Management, File Management System, Device Drivers, Linux commands Utilities and Editor ,Some Useful Commands, Permission Modes and Standard Files, Pipes, Filters and Redirection, Shell Scripts, Graphical User Interface, Editor.

UNIT:4 Windows 2000 networking : (8 Lectures Prac: 6)

Windows 2000 Operating System Architecture and services, managing Windows 2000 Server Using Windows 2000 and Client, Advanced Windows 2000 Networking.

UNIT:5 Windows XP Networking : (8 Lectures Prac: 6)

Introduction to Windows XP Networking, TCP/IP Protocol Setting for Windows XP, Virtual Private Networks and Remote Networking, Sharing Files in Windows XP, Sharing Folders in Windows XP, Sharing Drives in Windows XP, Enabling Offline File Features.

Lectures- 40 Tutorials – 05 Practical: 30 Total Hours: 75

SOFTWARE LAB BASED ON COMPUTER NETWORKS:

Implement the concepts of Computer Networks such as:

1. Simulate Checksum Algorithm.
2. Simulate CRC Algorithm
3. Simulate Stop & Wait Protocol.
4. Simulate Go-Back-N Protocol.
5. Simulate Selective Repeat Protocol.

SUGGESTED READINGS/REFERENCES

1. Tanenbaum, Andrew S.; Woodhull, Albert S., Operating Systems. Design and Implementation, Upper Saddle River, N.J.: Pearson/Prentice Hall, 2006, ISBN0-13-142938-8.
2. Behrouz A. Forouzan, Data Communication and Networking, 4th Edition, TMH 2004.
3. Gouglas Comer, Internetworking with TCP/IP, Volume 1, 4th Edition, Prentice Hall, 2000.
4. Resource Kit, Windows 2000 Professional, Microsoft Press.
