

## DEPARTMENT OF COMPUTER APPLICATIONS

### COURSE MODULE: Computer Networks

<b>Course Coordinator:</b> Prof. Poojitha S				<b>Academic Year:</b> 2025-26		
<b>Department:</b> Bachelor of Computer Application						
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours		Total Hrs/ Sessions
				L:T: P:S		
BBCA304	Computer Networks	PCC		3:0:0:0	40- 45(TH)	
<b>Course Learning Objective:</b> <ul style="list-style-type: none"> <li>• Study the TCP/IP protocol suite, switching criteria and Medium Access Control protocols for reliable and noisy channels.</li> <li>• Learn network layer services and IP versions.</li> <li>• Discuss transport layer services and understand UDP and TCP protocols.</li> <li>• Demonstrate the working of different concepts of networking layers and protocols.</li> </ul>						
<b>Teaching-Learning Process (General Instruction):</b> <ol style="list-style-type: none"> <li>1. Adopt different types of teaching methods to develop the outcomes through PowerPoint presentations and Video demonstrations.</li> <li>2. Adopt collaborative (Group Learning) Learning in the class.</li> <li>3. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills and develops thinking skills such as evaluating, generalizing, and analyzing information.</li> </ol>						
<b>Module-1</b>						
<b>Introduction:</b> Data Communications, Networks, Network Types. <b>Networks Models:</b> Protocol Layering, TCP/IP Protocol suite, The OSI model, <b>Transmission Media:</b> Transmission media, Guided Media, Unguided Media.						
<b>Module-2</b>						
<b>Data Link Layer: Error Detection and Correction:</b> Introduction, Block Coding, Cyclic Codes. <b>Datalink control:</b> DLC Services: Framing, Flow Control, Error Control, Connectionless and Connection Oriented, Data link layer protocols, High Level Data Link Control. <b>Media Access Control:</b> Random Access, Controlled Access.						
<b>Module-3</b>						
<b>Network Layer:</b> Network layer Services, Packet Switching, IPv4 Address, IPv4 Datagram, IPv6 Datagram. <b>Routing Algorithms:</b> Unicast Routing Protocols: DVR, LSR, PVR, Unicast Routing protocols: RIP, OSPF, BGP, Multicasting Routing-MOSPF.						
<b>Module-4</b>						
<b>Transport Layer: Introduction,</b> Transport-Layer Protocols: Introduction, User Datagram Protocol, Transmission Control Protocol: services, features, segments, TCP connections, flow control, Error control, Congestion control.						
<b>Module-5</b>						
<b>Application Layer:</b> Introduction, Client-Server Programming Standard Client Server Protocols: World Wide Web and HTTP, FTP, Electronic Mail, Domain Name System (DNS), TELNET, Secure Shell (SSH).						

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### Course outcome (Course Skill Set)

At the end of the course the student will be able to :

- CO1. Explain fundamentals of computer networks.
- CO2. Understand error detection and control in data link layer.
- CO3. Apply routing protocols in network layer.
- CO4. Analyze the principles of protocol layering in modern communication systems.
- CO5. Demonstrate various client-server protocols in application layer.

### Assessment Details (both CIE and SEE) of Course;

To satisfy academic requirements and earn credits for each subject/course, students must meet the following criteria:

- Secure at least 40% (20/50 marks) in Continuous Internal Evaluation (CIE)
- Obtain a minimum of 35% (18/50 marks) in the Semester End Exam (SEE)

Achieve a combined total of at least 40% (40/100 marks) in both CIE and SEE

### Continuous Internal Evaluation (CIE) Components:

- Unit Tests (Internal Assessment Tests): 2 tests, each 25 marks (1 hour duration)
  - Test 1: After completing 40-50% of the syllabus
  - Test 2: After completing 85-95% of the syllabus
- Assignments: 2 assignments, each 25 marks (1 hour duration)
  - Any two methods

### CIE Marks Calculation:

- Sum of marks from two tests and two assignments = 100 marks
- Scaled down to 50 marks

### CIE Design:

- Each CIE method should cover a different portion of the syllabus to minimize stress and repetition
- CIE methods/question papers are designed to assess different levels of Bloom's taxonomy as per the course outcomes

### Semester End Examination:

Theory SEE:

- Conducted by the University as per the scheduled timetable
- Common question papers for the subject (duration: 3 hours)
- Question Paper Structure:
  - 10 questions, each worth 20 marks
  - 2 questions from each module, with a mix of topics under each module (max. 3 sub questions per question)

Answering Scheme:

- Students must answer 5 full questions, selecting one from each module.

Marking Scheme:

- Marks scored will be proportionally reduced to 50 marks Each full question will have a sub-question covering all the topics under a module.

### Suggested Learning Resources:

#### Books

1. Behrouz A. Forouzan, Data Communications and Networking, 5th Edition, Tata McGraw-Hill, 2013.

#### Reference Books:

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1. Larry L. Peterson and Bruce S. Davie: Computer Networks – A Systems Approach, 4th Edition, Elsevier, 2019
2. Nader F. Mir: Computer and Communication Networks, 2nd Edition, Pearson Education, 2015.
3. William Stallings, Data and Computer Communication 10th Edition, Pearson Education, Inc., 2014.

### The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Subject Code: BBKA304		TITLE: Computer Science						Faculty: POOJITHA S	
List of Course Outcomes	Program Outcomes								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
CO-1									
CO-2									
CO-3									
CO-4									
CO-5									
Total									

**Note:** 3 = High Contribution 2 = Medium Contribution 1 = Low Contribution - = No Contribution