

**AIDS2203: Computer Networks**  
**Session 2022-23 (ODD Term)**

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- 1. Course Teacher : Prof. Shweta N. Jain**  
**Office : Computer Technology Department**  
**Office Hours : Monday to Friday 10.00 A.M.to 5.00P.M**  
**Phone : 9021860276**  
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**Course Website : <http://www.ct.ycce.in/>**

- **Vision of YCCE**

“To become the most preferred institution providing innovative, research and value based, professional education for the society at large”.

- **Mission of YCCE**

**YCCE is committed to:**

- Attract best talent and create learning ambience
- Practice Innovative teaching-learning & research
- Integrate Industry-Institute Collaborations
- Nurture students towards holistic development and choicest career

- **Vision of Department**

To be a well-known center for pursuing computer education through innovative pedagogy, value-based education and industry collaboration.

- **Mission of Department**

To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary arena by developing problem-solving skills through emerging technologies.

**2. Course Objectives**

1. Understand the importance of layering architecture and classify different types of networks.
2. Study of different protocols at various layers.
3. Study of modern networking tools.

**3. Course Outcomes**

CO1: Understand design issues of layers and network reference model

CO2: Solve the given problems related to networking domain

CO3: Analyze different networking protocol at various layers

CO4: Evaluate the performance of network using different tools

**4. Mapped Program Outcomes: 1,2,3,5,6,7,8, PSO1, PSO2**

- 1] Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.
- 2] Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3] Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate

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consideration for public health and safety, and cultural, societal, and environmental considerations.

5] Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities, with an understanding of the limitations.

6] The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7] Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8] Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PSO1. An ability to acquire skills to design & develop quality software using cutting-edge technologies of Computer Engineering.

PSO2. An ability to use knowledge of various domains as per thrust areas to formulate and implement ideas for providing innovative solutions

5. **Grading:** Grading is based on the following components that are weighted as described below

SN	Criteria	Distribution of marks(%)
1	Proctored online exam 1 on campus – 3 marks on unit no 1, 2, 3 Proctored online exam 2 on campus – 3 marks on unit no 4, 5, 6	6
2	Assessment Methods Infosys Spring Board Certification Course, Electronic Question Bank Solution and Value added courses. (4+4+3=11 Marks)	11
3	Class performance Attendance	3
4	Mid Semester Examinations-I	30
5	Mid Semester Examinations-II	
7	End Semester Examination	50
<b>TOTAL</b>		<b>100</b>

**6. Syllabus and Mark Distribution Unit Wise**

CT2301	Computer Networks			L=3	T=0	P=0	CREDITS = 3
EVALUATION SCHEME							
MSE – I, MSE – II		TA	ESE	TOTAL		ESE DURATION	
15	15	20	50	100		3 Hr	

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Unit	Syllabus	MSE-I	MSE-II	ESE
<b>I</b>	Introduction: The uses of computer networks, LAN's, MAN's, WAN's., protocol hierarchies, design issues for layers, interfaces and services, connection oriented and connectionless services, service primitives relationship of services to protocols. The OSI reference model. TCP/IP reference model, Comparison of OSI & TCP/IP reference models, Critique of OSI model & protocols, critique of TCP/IP reference model.	<b>5</b>	<b>--</b>	<b>6 OR 7</b>
<b>II</b>	Transmission Impairments, Transmission Media: Guided, unguided, Architecture of the Internet, Wireless LANs: IEEE 802.11, IEEE 802.16 , The Public Switched Telephone Network, Switching: circuit, packet and message switching, Modems	<b>5</b>	<b>--</b>	<b>6 OR 7</b>
<b>III</b>	The Data Link Layer: Data link layer design issues- Framing, Error Control, Flow Control, Link Management, Error detection and Correction-Error-Correcting Codes, error-detecting codes, Elementary data link protocols-An Unrestricted simplex Protocol, A simplex stop and wait protocol, A simplex protocol for a noisy channel, Sliding window protocols- A one bit sliding window protocol, Go Back N protocol, Selective Repeat Protocol.	<b>5</b>	<b>--</b>	<b>6 OR 7</b>
<b>IV</b>	The Medium Access Sublayer: Static and Dynamic Channel allocation in LAN's and MAN's, Access Protocols-ALOHA, Persistent and Non Persistent CSMA, CSMA/CD, Collision free protocols, Binary countdown, Limited-connection protocol: The adaptive tree walk protocol.	<b>--</b>	<b>5</b>	<b>6 OR 7</b>
<b>V</b>	The Network Layer: Network Layer design issues-services provided to the transport layer, Logical Addressing: Classbase and classless, Subnetting and Supernetting, Routing and Routing Algorithms-Flooding, Flow-Based, Distance Vector, Link State, Hierarchical. Congestion Control algorithms-Preallocation of buffers, Packet discarding, Choke packets, Load shedding, Jitter control. Leaky bucket algorithm, token bucket algorithm, IP header format (IPv4, IPv6)	<b>--</b>	<b>5</b>	<b>6 OR 7</b>
<b>VI</b>	The Transport Layer: Transport layer design issues-services provided to the session layer, Quality of service, transport service primitives, Elements of transport protocols-Addressing, Establishing and Releasing a connection, Flow control and Buffering, Multiplexing, Crash Recovery. Transmission Control Protocol (TCP). The Application Layer: DNS, SMTP, FTP, TFTP.	<b>--</b>	<b>5</b>	<b>6 OR 7</b>

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**7. TEACHING PLAN:**

<b>Lect. No.</b>	<b>Unit No.</b>	<b>Topic Cover</b>
1	<b>I</b>	Introduction: The uses of computer networks
2	<b>I</b>	LAN's, MAN's, WAN's
3	<b>I</b>	Protocol hierarchies, Design issues for layers, interfaces and services
4	<b>I</b>	Connection oriented and connectionless services, service primitives relationship of services to protocols
5	<b>I</b>	The OSI reference model
6	<b>I</b>	TCP/IP reference model, Comparison of OSI & TCP/IP reference models, Critique of OSI model & protocols, critique of TCP/IP reference model
7	<b>II</b>	Transmission Impairments
8	<b>II</b>	Transmission Media-Guided, Unguided
9	<b>II</b>	Architecture of the Internet
10	<b>II</b>	Wireless LANs: IEEE 802.11, IEEE 802.16
11	<b>II</b>	Public switched Telephone Network
12	<b>II</b>	Switching: circuit, packet and message switching, Modems
13	<b>III</b>	The Data Link Layer: Data link layer design issues
14	<b>III</b>	Framing, Error Control
15	<b>III</b>	Flow Control, Link Management
16	<b>III</b>	Error detection and Correction-Error-Correcting Codes, Error-detecting codes
17	<b>III</b>	Elementary data link protocols: An Unrestricted simplex Protocol, A simplex stop and wait protocol
18	<b>III</b>	A simplex protocol for a noisy channel
19	<b>III</b>	Sliding window protocols - A one bit sliding window protocol
20	<b>III</b>	Go Back N protocol, Selective Repeat Protocol
21	<b>IV</b>	The Medium Access Sublayer: Static and Dynamic Channel allocation in LAN's and MAN's

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22	<b>IV</b>	Access Protocols-ALOHA,
23	<b>IV</b>	Persistent and Non Persistent
24	<b>IV</b>	CSMA, CSMA/CD
25	<b>IV</b>	Collision free protocols, Binary countdown
26	<b>IV</b>	Limited-connection protocol. The adaptive tree walk protocol
27	<b>V</b>	The Network Layer: Network Layer design issues-services provided to the transport layer
28	<b>V</b>	Logical Addressing: Classbase and classless,
29	<b>V</b>	Subnetting and Supernetting
30	<b>V</b>	Routing and Routing Algorithms-Flooding, Flow-Based,
31	<b>V</b>	Distance Vector
32	<b>V</b>	Link State, Hierarchical
33	<b>V</b>	Congestion Control algorithms- Preallocation of buffers, Packet discarding, Choke packets, Load shedding, Jitter control
34	<b>V</b>	Leaky bucket algorithm, token bucket algorithm
35	<b>V</b>	IP header format(IPv4, Ipv6)
36	<b>VI</b>	The Transport Layer: Transport layer design issues-services provided to the session layers
37	<b>VI</b>	Quality of service, transport service primitive
38	<b>VI</b>	Elements of transport protocols-Addressing, Establishing and Releasing a connection
39	<b>VI</b>	Flow control and Buffering, Multiplexing, Crash Recovery
40	<b>VI</b>	Transmission Control Protocol (TCP)
41	<b>VI</b>	The Application Layer: DNS, SMTP
42	<b>VI</b>	FTP, TFTP

**8. Examinations:**

- i. Proctored online exam 1 on campus –unit no 1, 2, 3 **(03 MARKS)**  
Proctored online exam 2 on campus –unit no 4, 5, 6 **(03 MARKS)**

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ii. **TEACHERS ASSESSMENT (11 MARKS) :**

1. Infosys Spring Board Certification Course.(4 marks)

In this, all the students have to do a certified course “World of Computer Networking” of Infosys Spring Board and submit the certificates.

2. Electronic Question Bank Solution. (4 marks)

In this, each student has to give solutions of two questions given by teacher. Every student will be having two different questions.

Submission on time: 2 marks

Correct solution: 2 marks

3. Value added Course (VAC) (3 marks)

iii. **SCHEDULED EXAMINATIONS:** There will be 3 scheduled exams during semester. There will be Two Mid Sem Examinations (MSE) and shall be compulsory for evaluation of course assessment marks. The schedule of these examinations is given in the Academic Calendar for the session published by the Dean (Academic matters)

MSE #1 : On the basis of Unit 1, 2 and 3 of the syllabus

MSE #2 : On the basis of unit 4, 5 and 6 of the syllabus.

REMSE : In lieu of **at the most one MSE** in which student remained absent on the basis of All Unit 1, 2, 3, 4, 5 and 6 of the syllabus

ESE : On the basis of Units 1 to 6 of the syllabus

**9. Innovative Teaching Method Planned:**

S.N.	Innovative Teaching Method
1	Spring Board

**10. Text Books**

SN	Author Name	Title	Publication
1.	Andrew S. Tannenbaum	Computer Networks	Pearson Education

**11. Reference Book**

SN	Author Name	Title	Publication
1.	Behrouz A. Forouzan Firouz Mosharraf	Computer Networks	Tata McGraw Hill

Name and Signature of HOD:  
Dr. Rakhi Wajgi

Name and Signature of Course Teacher:  
Shweta N. Jain