LECTURE PLAN

Institute/Department	UNIVERSITY INSTITUTE OF COMPUTING (UIC)	**Program**	**Master of Computer Applications (MC305)**
Master Subject Coordinator Name:	Indu Sharma	**Master Subject Coordinator E-Code**:	**E15037**
Course Name	Advanced Computer Networks	**Course Code**	**23CAT-503**

Lecture	Tutorial	Practical	Self Study	Credit	Subject Type
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Course Type	Course Category	Mode of Assessment	Mode of Delivery
Major Core	Graded (GR)	Theory Examination (ET)	Theory (TH)

Mission of the Department	M1. To provide innovative learning centric facilities and quality-oriented teaching learning process for solving computational problems. M2. To provide a framework through Project Based Learning to support society and industry in promoting a multidisciplinary activity. M3. To develop crystal clear evaluation system and experiential learning mechanism aligned with futuristic technologies and industry. M4. To provide doorway for promoting research, innovation and entrepreneurship skills in collaboration with industry and academia. M5. To undertake societal activities for upliftment of rural/deprived sections of the society.
Vision of the Department	To be a Centre of Excellence for nurturing computer professionals with strong application expertise through experiential learning and research for matching the requirements of industry and society instilling in them the spirit of innovation and entrepreneurship.

Program Educational Objectives(PEOs)	
PEO1	Establish a well-fortified computing foundation of successful professionals by applying computing fundamentals and domain-specific knowledge, demonstrating their innovative skills and considering social and environmental concerns.
PEO2	Undertake successful implementation of ethical solutions as an individual or a member or a leader of a team by investigating, analyzing, formulating and solving complex computing problems in multidisciplinary approaches using modern tools.
PEO3	Enhance professionalism and ethical attitude in the profession while communicating with local, national, and foreign peers, bound within regulations and leading to lifelong learning.
PEO4	Promote awareness for uplifting health, safety, legal, environmental, ethical and cultural diversity issues for serving the society.

Program Specific OutComes(PSOs)	
PSO1	Analyze their abilities in systematic planning, developing, testing and executing complex computing applications in field of Social Media and Analytics, Web Application Development and Data Interpretations.
PSO2	Apprise in-depth expertise and sustainable learning that contributes to multi-disciplinary creativity, permutation, modernization and study to address global interest.

Program OutComes(POs)	
PO1	Apply mathematics and computing fundamental and domain concepts to find out the solution of defined problems and requirements. (Computational Knowledge)
PO2	Use fundamental principle of Mathematics and Computing to identify, formulate research literature for solving complex problems, reaching appropriate solutions. (Problem Analysis)
PO3	Understand to design, analyze and develop solutions and evaluate system components or processes to meet specific need for local, regional and global public health, societal, cultural, and environmental systems. (Design/Development of Solutions)
PO4	Use expertise research-based knowledge and methods including skills for analysis and development of information to reach valid conclusions. (Conduct Investigations of Complex Computing Problems)
PO5	Adapt, apply appropriate modern computing tools and techniques to solve computing activities keeping in view the limitations. (Modern Tool Usage)
PO6	Exhibiting ethics for regulations, responsibilities and norms in professional computing practices. (Professional Ethics)

PO7	Enlighten knowledge to enhance understanding and building research, strategies in independent learning for continual development as computer applications professional. (Life-long Learning)
PO8	Establishing strategies in developing and implementing ideas in multi- disciplinary environments using computing and management skills as a member or leader in a team. (Project Management and Finance)
PO9	Contribute to progressive community and society in comprehending computing activities by writing effective reports, designing documentation, making effective presentation, and understand instructions. (Communication Efficacy)
PO10	Apply mathematics and computing knowledge to access and solve issues relating to health, safety, societal, environmental, legal, and cultural issues within local, regional and global context. (Societal and Environmental Concern)
PO11	Gain confidence for self and continuous learning to improve knowledge and competence as a member or leader of a team. (Individual and Teamwork)
PO12	Learn to innovate, design and develop solutions for solving real life business problems and addressing business development issues with a passion for quality competency and holistic approach. (Innovation and Entrepreneurship)

Text Books

Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	“Data Communications and Networking”	Behrouz A Forouzan	4	McGraw Hill	2017
2	Computer Networks	Andrew S. Tanenbaum	6	Pearson Education	2022

Reference Books

Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	Computer Networking	James F. Kurose, Keith W. Ross	6	Pearson Education	2012
2	AdHoc Mobile Wireless Network: Principles, Protocols, and Applications	Subir Kumar Sarkar, T.G. Basavaraju, C. Puttaamada	1	CRC Press	2007

Course OutCome

SrNo	OutCome
CO1	Understand the fundamental concepts and principles of computer networks along with the OSI and TCP/IP model and its relevance to modern networking.
CO2	Evaluate different routing protocols and understand their role in establishing efficient routing paths in networks.
CO3	Gain knowledge of mobile computing architecture, including the presentation, application, and data tiers, and their role in mobile applications.
CO4	Analyze and compare wireless communication systems, including 2G, 3G, and 4G, and understand the architecture and security challenges associated with wireless networks.
CO5	Comprehend features of SDN and its application to next generation systems

Lecture Plan Preview-Theory

Unit No	LectureNo	ChapterName	Topic	Text/ Reference Books	Pedagogical Tool**	Mapped with CO Numer (s)
1	1	Introduction to computer network	Introduction to computer network, components for communication (mode, medium and media)	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	2	Introduction to computer network	OSI model	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	3	Introduction to computer network	TCP/IP model	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT,Video Lecture	CO1

1	4	Introduction to computer network	physical layer (Digital and Analog Signals, ethernet, IEEE standards)	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	5	Network Layer	Network Layer: IP address classes, sub netting	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	6	Network Layer	Classless Inter-domain routing (CIDR), ARP, RARP and DHCP concepts	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO2
1	7	Network Layer	IPv4 & IPv6	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	8	Network Layer	The routing protocols: RIP, OSPF, BGP, IP Multicasting	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT,Video Lecture	CO2
1	9	Network Layer	Multicast routing protocols,	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO2
1	10	Network Layer	Address assignments, session discovery, etc.	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO2
1	11	Transport layer	Transport layer: Design issues of transport layer	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	12	Transport layer	addressing	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	13	Transport layer	Establishing Connection	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	14	Transport layer	Flow Control and Multiplexing	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
1	15	Transport layer	Transport protocols: TCP and UDP	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
2	16	Application Layer	WWW, DNS	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
2	17	Application Layer	MIME	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
2	18	Application Layer	HTTP, SMTP	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
2	19	Application Layer	POP, IMAP	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
2	20	Application Layer	FTP	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
2	21	Application Layer	Telnet	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO1
2	22	Mobile Computing	Introduction to Mobile Computing	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO3
2	23	Mobile Computing	Devices	,T-“Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO3

2	24	Mobile Computing	Networks: Wireline, Wireless, Ad-hoc	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO3
2	25	Mobile Computing	Revision: Networks: Wireline, Wireless, Ad-hoc	,T-"Data Communications and Netwo,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO3
2	26	Mobile Computing	Architecture: Architecture of Mobile Computing	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO3
2	27	Mobile Computing	3- Tier Architecture	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO3
2	28	Mobile Computing	Presentation (Tier-1)	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO3
2	29	Mobile Computing	Application (Tier -2),	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO3
2	30	Mobile Computing	Data (Tier – 3).	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO3
3	31	Wireless Communication	Comparison of Common wireless system	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4
3	32	Wireless Communication	Architecture of 2G, 3G, 4G	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4
3	33	Wireless Communication	Wireless Local Area network (WLAN), Wi-Fi, WiMAX, Wireless Ad-hoc Network	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4
3	34	Wireless Communication	Security issues and challenges in a Wireless network	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4
3	35	Wireless Communication	MANET	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4
3	36	Introduction to ad-hoc networks	Introduction to ad-hoc networks – definition, characteristics features	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4
3	37	Introduction to ad-hoc networks	applications Ad-hoc Mobility Models:-Indoor and out-door models.	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4
3	38	Introduction to ad-hoc networks	Security issues and challenges in ad-hoc networks,	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4
3	39	Introduction to ad-hoc networks	Routing Protocols: Design issues, goals and classification, Data Dissemination and Clustering	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO4

3	40	SDN	SDN: Introduction and Architecture of Software Defined Network,	,T-"Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO5
3	41	SDN	Characteristics of SDN, Operations, Devices, Controller, Applications of SDN.	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO5
3	42	SDN	SDN: Introduction and Architecture of Software Defined Network	,T-"Data Communications and Netwo,T-Computer Networks,R-Computer Networking	PPT	CO5
3	43	SDN	Characteristics of SDN, Operations,	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO5
3	44	SDN	Devices, Controller	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO5
3	45	SDN	Applications of SDN.	,T-"Data Communications and Netwo,T-Computer Networks,R-AdHoc Mobile Wireless Network:,R-Computer Networking	PPT	CO5

Assessment Model			
Sr No	Assessment Name	Exam Name	Max Marks
1	20EP02	External Theory	60
2	20EP02	Attendance Marks	2
3	20EP02	Mid-Semester Test-1	20
4	20EP02	Quiz	6
5	20EP02	Short Term Paper / Research Paper	12
6	20EP02	Mid-Semester Test-2	20

CO vs PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	1	NA	1	NA	NA	NA	NA	NA	NA	NA	NA	1
CO2	3	2	NA	1	1	NA	2	1	NA	NA	NA	2	NA	2
CO3	3	3	NA	1	2	NA	2	1	NA	NA	NA	3	1	3
CO4	3	3	NA	1	3	NA	2	1	NA	NA	NA	3	NA	2
CO5	2	3	NA	1	2	NA	2	1	NA	NA	NA	3	NA	2
Target	2.8	2.4	1	1	1.8	NA	2	1	NA	NA	NA	2.75	1	2