AMITY UNIVERSITY
UTTAR PRADESH

Course Title: ADVANCED DATA COMMUNICATION AND COMPUTER NETWORKS

Credit Units:

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	-	4	-	5

Course Level: PG
Course Code: IT602

Course Objectives:

The objective of the course is to provide thorough understanding & in-depth knowledge of concepts in computer networks Such as Internet protocols and routing, local area networks, wireless communications and networking, performance analysis, congestion control, TCP, network address translation, multimedia over IP, switching and routing, mobile IP, multicasting, IPv6. Peer-to-peer networking, network security, and other current research topics. A focus will be placed on wireless networking, reflecting rapid advances in this area. This course motivates the students to explore current research areas in the same field

Pre-requisites: Student should have idea about networking, basic means of communication, applications

Course Contents/Syllabus:

	Weightage (%)
Module I • Uses computer networks Reference Models • TCP/IP suite of protocols • Protocols for high-speed LANS, MANs, and wireless LANs. (For example, FDDI, DQDB, HIPPI, Gigabit Ethernet, Wireless Ethernet, etc.) • Fast access technologies. (For example, ADSL, Cable Modem, etc.)	**20**
Module II ▪ Network Layer Design Issues ▪ Routing Algorithms, ▪ Congestion Control Algorithms, ▪ Quality of Service, ▪ Internet Working, ▪ Network Layer in Internet. ▪ IPv6 basic protocol-extensions and options, ▪ support for QoS, ▪ security ▪ Changes to other protocols, ▪ Application Programming Interface for IPv6	**20**

Module III ▪ Mobile IP ▪ IP Multicasting. ▪ Multicast routing protocols ▪ address assignments ▪ session discovery	**15**
Module IV ▪ The Transport Protocol: The Transport Service, ▪ Elements of transport protocol, ▪ A simple Transport Protocol, ▪ Internet Transport Protocols UDP ▪ Internet Transport Protocols TCP, ▪ TCP extensions for high-speed networks ▪ Transaction-oriented applications Performance Issues. ▪ The Application Layer: DNS-(Domain Name System), Electronic Mail, World Wide Web Multimedia	**25**
Module V ▪ Overview of network security ▪ Secure-HTTP ▪ SSL, ▪ ESP, ▪ Key distribution protocols. ▪ Digital signatures, ▪ digital certificates-mail Security, ▪ Web security, ▪ Social Issues ▪ Various installations and connections of LAN, WAN etc	**20**

Student Learning Outcomes:

- To apply the knowledge gained in areas of networking
- To create a robust network foundation in theoretical and experimental work to analyze &create computer network.
- To gain expertise in designing, implementation and development of computer based network systems and IT processes.
- To support team work with a spirit of tolerance, patience and understanding to achieve common goal through networking.
- To analyze the local and global impact of Information Technology on individuals, organizations and society.
- Create simplicity and reliability out of complexity and unreliability in networking.

Pedagogy for Course Delivery:

The course would be covered under theory and laboratory. In addition to assigning project–based learning, early exposure to hands-on design to enhance the motivation among the students. It incorporates designing of problems, analysis of solutions submitted by the students groups and how learning objectives were achieved. Continuous evaluation of the students would be covered under quiz, viva etc.

Lab/Practical's details, if applicable:

Implementations of LAN, WAN, ETC concepts using network simulation tools.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical (%)	Total
60%	40%	100%

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Mid Term Exam	Home Assignment	Presentation/Viva	Attendance	
Weightage (%)	10%	8%	7%	5%	70%

Lab/ Practical/ Studio Assessment:

	Continuous Assessment/Internal Assessment				End Term Examination
Components (Drop down	Lab Record	Performance	Viva	Attendance	
Weightage (%)	10%	10%	5%	5%	70%

Text Reading:

- Computer Networks - Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
- Data Communications and Networking – Behrouz A. Forouzan. Fourth Edition TMH.

References:

- Computer Communications and Networking Technologies –Michael A.Gallo, WilliamM .Hancock - Thomson Publication.
- W. Stallings. Cryptography and Network Security: Principles and Practice Prentice Hall.
- W. R. Stevens. TCP/IP Illustrated, Volume 1: The protocols, Addison Wesley
- C. E. Perkins, B. Woolf, and S. R. Alpert. Mobile IP: Design Principles and Practices, Addison Wesley