National Institute of Technology Meghalaya
An Institute of National Importance

CURRICULUM

Programme	Bachelor of Technology in Electronics and Communication Engineering					Year of Regulation			**2018-19**
Department	Electronics and Communication Engineering					Semester			VI

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EC 314	**Data Communication and Networks**	3	1	0	4	50	50	100	200

Course Objectives		Course Outcomes	
	To introduce communication network architecture	CO1	Able to understand data communication networks and identification of its applications
	To teach the utility of the layered architecture	CO2	Able to relate the TCP/IP layer model with real-life data communication
	To develop an ability and skill to design various communication networks	CO3	Able to analyze the requirements for an organizational network layout and give the most appropriate networking architecture and technologies suited
	To develop an ability and skill to design various wired and wireless networks	CO4	Able to design a computer communication network (Such as LAN) and having a working knowledge of connectionless and connection-oriented protocols and their security features.

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
1	CO1	3	2	3	1	-	-	-	-	-	-	-	-	3	-	2	3
2	CO2	2	2	-	1	-	-	-	-	-	-	-	-	2	-	3	2
3	CO3	3	3	2	1	2	-	-	-	-	-	-	-	2	3	2	2
4	CO4	2	2	2	-	2	2	-	-	-	-	-	-	2	3	2	2

SYLLABUS

No.	Content	Hours	COs
I	**Data Communication and Networking Overview:** A Communication Model, Data Communication, Data Communication Networking Concept, ISP, Topology and Transmission Media, Concept of Client and Server, An Example Configuration. **Protocol Architecture:** The Need for Protocol Architecture, A Simple Protocol Architecture, OSI Reference Model, The TCP/IP Protocol Architecture.	**08**	**CO1, CO2**
II	**Digital Data Communication Issues:** Asynchronous and Synchronous Transmission, Concept of Frames and Packets, Types of Errors, Error Detection, Error Correction, Line Configurations, Interfacing, Physical, Logical and Port Address	**08**	**CO1, CO2**
III	**Data Link Layer** Data Link Control Medium Access Control (Mac) And Logical Link Control (LIC) Sub layer Issues, Flow Control, Error Control, Sliding Window Protocol, Polling, High-Level Data Link Control (HDCL), Performance Issues. **Local Area Network Overview:** LAN Protocol Architecture, Bridges, Emergence of High Speed LANs, Ethernet, Token Bus, Token Ring, Wireless LAN Technology (Wi-Fi).	**10**	**CO2, CO3**
IV	**Routing And Congestion Control In Switched Networks:** Routing In Circuit-Switching Networks, Routing In Packet-Switching Networks, Broadcasting, Multicasting, Flooding, Routing Algorithm, Effects of Congestion, Congestion Control In Packet Switching Networks. **Internetwork Protocols:** Basic Protocol Functions, Principles Of Internetworking, Fragmentation Concept, Connectionless Internetworking, Gateway And Routers, IPv4, Subnet, The Internet IPv6. **Transport Protocols:** Quality of Service Parameter, TCP And UDP Protocols.	**12**	**CO4**
V	**Network Security:** Security Requirement and Attacks, Confidentiality With Encryption, Message Authentication and Hash Functions, Public-Key Encryption and Digital Signatures. **Distributed Applications:** File Transfer Protocol (FTP), Electronic Mail - SMTP and MIME, Hyper Transfer Protocol (HTTP), Network Management - SNMP, Domain Name Server (DNS), URL, WWW, ATM And ISDN Networks	**10**	**CO3, CO4**
	Total Hours	**48**	

Essential Readings

1. Behrouz A. Forouzen , "Data Communications and Networking", 4th ed.,Tata Mcgraw-Hill, 2007.

2. William Stalling, "Data and Computer Communications", 8th ed. PHI, 2006.

Supplementary Readings

1. Andrew S. Tanenhaun , "Computer Networks", 5th ed.,PHI, 2014.

2. Garcia Leon and Widjaja , "Communication Networks", 2nd ed. Tata Mcgraw-Hill, 2004.