University of Technology Computer Engineering Department Academic Year 2023-2024 3st Year- Second semester- All Branches	

CE-CN341	Data Communication	2 Hr/Week	2 Units

Contents of syllabus	Hours
1.Data and signal-Analog and digital signals 1. What is Data Communication? 1.1. Components of data communication system 1.2. Data Representation 1.2.1 Data and Data Types. 1.2.2 Signal and Signal Types. 1.3. Time and frequency domain representation. 1.4. Spectrum and Bandwidth of a signal. 1.5. Propagation Time and Wavelength. ❖ Transmission Impairments and Channel Capacity 1.1. Sources of impairment. 1.2. Attenuation. 1.3. Distortions of a signal. 1.4. Distinguish between Bite Rate and Baud Rate. 1.5. Effect of noise.	
2. Data and signal-Analog and digital signals 2.1. Bandwidth, bit rate, bit length. 2.2. Baseband and broadband transmission 2.3. Attenuation and distortion, 2.4. Throughout, delay, Jitter, Bandwidth delay product. 2.5. SIGNAL ENCODING TECHNIQUES. 2.5.1. Uipolar ,Polar and Bipolar 2.5.2.Line coding Techniques Polar(Manchester and Differential Manchester).	

3.Multiplexing and Switching Techniques 3.1 Frequency-division Multiplexing (FDM). 3.2 Time-division Multiplexing (TDM). 3.3. Wavelength division multiplexing(WDM) **4.Transmission and Encoding** 2.1. Parallel and serial transmission, 2.2. Synchronous and Asynchronous transmission 2.3. Simplex, half duplex and full duplex Modes 2.4.Non return to zero codes, return to zero codes, bipolar line codes, bauds , modem, Line configurations-Point to point and point to multipoint configuration.	
5. Switching Techniques Circuit Switching 5.1. packet and hybrid switching 5.2. Packet and hybrid switching 5.3. Integrated services digital network. 5.4. ISDN interface, ISDN devices, reference points ,ISDN services, 5.5.ISDN Protocols	

6.Error Detection and Correction 6.1. Types of error, single bit error, burst error, Error detection, cyclic redundancy check, Sources of error control approaches. 6.2. Implementation of error control Echo checking parity checking and cyclical purity, Hammering code, checksums, 6.3. Secured Communication **6.Transmission Media** 6.3 Guided (Wired) and Unguided (Wireless) 6.4. Twisted pair, Unshielded twisted pair and Shielded twisted pair. 6.5. Coaxial cable and fiber optic cable. 6.6. Cable standard-Category 5, 6 and 7, cross connection, straight connection cable coding standards. 6.6. Propagation Methods	
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References:-

1. “Data communication and networking”, Forouzan, TMH 4 th edition
2. Data communication and Computer Networks, Prakash C Gupta ,PHI Learning
3. **“**Computer Networks” - Tanenbaum ,PHI Learning.
4. “Communication Networks-Fundamental concepts and key Architectures”,Leon-Garcia,Widjaja, TMH
5. “Computer Communications & Networking Technologies”-Michael A. Gallo &William M. Hancock -Cengage pearsen publications
6. “Network for computer scientists & engineers” –Youlu zheng & shakil akhtar , Oxford pub.