Short Syllabus

BECE401L Computer Communications and Networks (3-0-0-3)

Layered Network Architecture - Network Topologies, ISO/OSI Reference Model; Internetworking devices – Repeater, Hubs, Switches, Bridges; Data Link Layer Logical Link Control - Error Detection Techniques; Data Link Layer Medium Access Control – Ethernet, Wireless LAN; Network Layer – Internetworking; Transport Layer - Connection oriented and Connectionless Service; Application Layer – SMTP, FTP, HTTP.

Course Code	Course Title	L	T	P	C
BECE401L	Computer Communications and Networks	3	0	0	3
Pre-requisite	BECE306L, BECE306P	Syllabus Version			
		1.0			

Course Objectives:

1. To familiarize the students with the basic terminologies and concepts of OSI, TCP/IP reference model and functions of various layers.
2. To make the students understand the design and performance issues associated with the functioning of LANs and WLANs.
3. To introduce the students to analyze the IP addressing and basics of transport and application layer protocols.

Course Outcome:

The students will be able to:

1. Infer the basic concepts of OSI and TCP reference model in computer network protocols and internetworking devices.
2. Examine the LAN bridges such as Transparent Bridges and Source Routing Bridges
3. Deploy the error & flow control mechanism and medium access control.
4. Configure the network with IP address and find the shortest path.
5. Analyze transport layer protocols and congestion control algorithms
6. Understand the fundamentals of DNS, FTP, SMTP, HTTP and network security.

Module:1	**Layered Network Architecture**	**6 hours**

Evolution of data Networks – Network Topologies –Switching Techniques – Multiplexing – Categories of networks – ISO/OSI Reference Model – TCP/IP Model – Addressing – Network performance metrics.

Module:2	**Internetworking devices**	**5 hours**

Repeaters – Hubs – Switches – Bridges: Transparent and Source Routing– Routers.

Module:3	**Data Link Layer-** Logical Link Control	**6 hours**

Error Detection Techniques – ARQ protocols – Framing – HDLC –Point to Point protocol.

Module:4	**Data Link Layer-** Medium Access Control	**8 hours**

Random access Protocols – Ethernet (IEEE 802.3) – Wireless LAN (IEEE 802.11); Scheduling approaches to MAC – Controlled Access – Token Bus/Ring (IEEE 802.4/5).

Module:5	**Network Layer**	**8 hours**

Internetworking – IP Addressing – Subnetting – IPv4 and IPv6– Routing – Distance Vector and Link State Routing – Routing Protocols.

Module:6	**Transport Layer**	**5 hours**

Connection oriented and Connectionless Service – User Datagram Protocol – Transmission Control Protocol – Congestion Control – QoS parameters.

Module:7	**Application Layer**	**5 hours**

Domain Name System – Simple Mail Transfer Protocol – File Transfer Protocol – Hypertext Transfer Protocol; Network Security and Cryptography– Virtual LAN – VPN – Enterprise Network: Types and Trends – Private Network.

Module:8	**Contemporary Issues**	**2 hours**
	Total Lecture:	**45 hours**

Text Book(s)			
1.	Alberto Leon-Garcia, Communication Networks, 2017, 2nd Edition, Tata McGraw-Hill, USA.		
Reference Books			
1.	Dimitri P. Bertsekas & Robert Gallager, Data Networks, 2013, 2nd Edition, Prentice Hall, USA.		
2.	W. Stallings, Data and Computer Communications, 2017, 10th Edition, Pearson Prentice Hall, USA.		
3.	Behrouz A Forouzan, Data Communications and Networking, 2017, 5th Edition, Tata McGraw-Hill, USA.		
Mode of Evaluation: Continuous Assessment Test, Digital Assignment, Quiz and Final Assessment Test			
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