EC 3023: COMPUTER NETWORKS

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Module 1 (8 hrs)
Introduction: Building blocks- links, nodes - Layering and protocols - OSI architecture - Internet architecture – Multiplexing -Circuit switching vs packet switching - Datagram Networks - Virtual Circuit networks.

Module 2 (10 hrs)
Direct link Networks: Framing - Error detection - Reliable transmission - Multiple access protocols - Ethernet (IEEE 802.3) - Token Rings (IEEE 802.5) - wireless LAN (IEEE 802.11) - Bridges and LAN switches - ATM networks.

Module 3 (14 hrs)
Internetworking: IPv4- addressing, datagram forwarding – ARP - Routing- distance vector (RIP) - Link state (OSPF) - routing for mobile hosts - Global Internet- subnetting – CIDR - inter-domain routing (BGP) - IPv6.
End to End protocols: Simple demultiplexer (UDP) - Reliable byte stream (TCP)- segment format, connection management, sliding window, flow control, adaptive retransmission, congestion control, TCP extension, performance.

Module 4 (10 hrs)
Broadband services and QoS issues: Quality of Service issues in networks- Integrated service architecture- Queuing Disciplines- Weighted Fair Queuing- Random Early Detection- Differentiated Services- Protocols for QOS support- Resource reservation-RSVP- Multi protocol Label switching- Real Time transport protocol.

Reference:

1.   Peterson L.L. & Davie B.S., "Computer Networks: A System Approach", Morgan Kaufman Publishers, 3rd edition, 2003.
2.   James. F. Kurose and Keith.W. Ross, "Computer Networks, A top-down approach featuring the Internet", Addison Wesley, 3rd edition, 2005.
3.   D. Bertsekas and R. Gallager, "Data Networks", PHI, 2nd edition, 2000.
4.   S. Keshav, "An Engineering Approach to Computer Networking", Pearson Education, 2005.