

COURSE TITLE	TE142448: Internet and Web Engineering Credits: 2 ELECTIVE COURSE
LEARNING OBJECTIVES	To study Internet architecture and various protocols used for the operation of Internet, as well as Web modeling and techniques used to analyze performance and content application in Internet.
COMPETENCY	The students are expected to: <ul style="list-style-type: none"> • Understand Internet architecture and various protocols used in Internet • Understand modeling of Web structure and techniques to analyze performance and content applications
SUBJECTS	<ul style="list-style-type: none"> • IPv4, addressing: address space, broadcast address, NAT, ICMP; unicast & multicast, IGMP. Addressing in IPv6, packet format, interoperation between IPv4 and IPv6. Routing and forwarding techniques, autonomous system, routing table; distributed routing information: distance vector, link state routing, path calculation, OSPF, traffic engineering, RIP, IS-IS, BGP-4, multicast. • Service management: DiffServ, integrated services, RSVOP. ECMP, IP flows routing, service based routing; offline and dynamic traffic engineering. • Introduction to MPLS, packet labeling, data mapping, signaling protocol, LDP, GMPLS. Distributed switch, GSMP, switch configuration, port management and connection. • Application protocols: DNS, host, DNS message format, Telnet, FTP, HTTP. • Web documents: SGML and HTML; resource identifiers: URI, URL; log files & search engines. • Web representation using graph: power law connectivity, small-world network, generation model for web graph. Text indexing, lexical processing, content-based ranking, latent semantic analysis, document clustering. Link analysis techniques, nonnegative matrix, dominant eigenvector, PageRank, probabilistically link stability and analysis; crawling technique: selective and distributed. Web dynamics.
MAIN REFERENCES	<ul style="list-style-type: none"> • Adrian Farrel, <i>The Internet and Its Protocols: A Comparative Approach</i>, Morgan Kaufmann, 2004. • Pierre Baldi, Paolo Frasconi & Padhraic Smyth, <i>Modeling the Internet and the Web: Probabilistic Methods and Algorithms</i>, John Wiley & Sons, 2003.
OPTIONAL REFERENCES	<ul style="list-style-type: none"> • Deepankar Medhi & Karthikeyan Ramasamy, <i>Network Routing: Algorithms, Protocols, and Architectures</i>, Morgan Kaufmann, 2007. • Gustavo Rossi, Oscar Daniel Schwabe & Luis Olsina, eds., <i>Web Engineering: Modelling and Implementing Web Applications</i>, Springer-Verlag, 2008. • IEEE/ACM Trans. on Networking
PREREQUISITE	-