

Topics Covered in Digital Communications Subjects
School of Information Technology, Swinburne University of Technology

	<u>Data Communications*</u>	<u>Local Area Networks*</u>	<u>Wide Area Networks*</u>
Application Layer	<ul style="list-style-type: none"> • Security, encryption, private and public key encryption algorithms • Email delivery, MIME, Simple Mail Transfer Protocol (SMTP) • Hypertext Transfer Protocol (HTTP) • Multimedia delivery protocols 	<ul style="list-style-type: none"> • Network management • Simple Network Management Protocol (SNMP & SNMPv2) • LAN interoperability issues at the application layer, resource and file sharing: NFS and SAMBA 	<ul style="list-style-type: none"> • Domain Name System (DNS)
Transport Layer	<ul style="list-style-type: none"> • Transport layer protocols, connection-oriented and connectionless services • Overview of TCP • Overview of UDP 		<ul style="list-style-type: none"> • Internet security • Firewall design
	<ul style="list-style-type: none"> • JAVA networking API, experiments with UDP datagrams 		<ul style="list-style-type: none"> • Detailed study of TCP, congestion and flow control at transport layer • Round-trip-time estimation algorithms
Network Layer	<ul style="list-style-type: none"> • IP addressing • Basic functions of routing 	<ul style="list-style-type: none"> • Routers in LAN interconnection • Subnet organization and addressing 	<ul style="list-style-type: none"> • Organization and evolution of the Internet • Principles of routing: link-state and distance-vector algorithms • Routing protocols: RIP, OSPF • Autonomous systems, interior and exterior gateway protocols: BGP • Internet multicasting • IPv6, differentiated and integrated services
			<ul style="list-style-type: none"> • X.25 packet switched networks • Frame relay networks • ISDN networks
Data Link Control Layer	<ul style="list-style-type: none"> • Principles of data communication protocols, error, flow and congestion control • Stop-and-wait, window based flow control protocols • DLC layer functions, High Level Data Link Control (HDLC) protocol operation • Analysis of protocol efficiency, effects of propagation and transmission delays • Protocol implementation issues 	<ul style="list-style-type: none"> • DLC layer in LANs • Logical Link Control (LLC) and Media Access Control (MAC) sublayers, IEEE standards, frame formats • Operation and properties of Ethernet, token-bus and token-ring MAC protocols • LAN bridging, transparent and source routing bridges, spanning tree algorithm • High-speed Ethernet-like LAN technologies: Ethernet switches, VG-AnyLAN, Gigabit Ethernet • FDDI and FDDI-II • ATM LANs, LAN emulation 	<ul style="list-style-type: none"> • DLC layer in WANs • IP over ATM
Physical Layer	<ul style="list-style-type: none"> • Physical layer standards and media properties 	<ul style="list-style-type: none"> • LAN cabling 	<ul style="list-style-type: none"> • SDH/SONET based fiber optic networks

* Shaded squares show the particular topics studied in greater detail.

2/1/00 10:38:14 Ahmet Sekercioglu