COURSE DESCRIPTION
Students learn fundamental networking concepts, design considerations, and topologies. Students focus on the components related to building Local Area Networks (LANs) and Wide Area Networks (WANs), utilising client server models, network operating systems (NOS), switches and routers. Students practical knowledge in network design tools, topology and cabling.

SPECIFIC OBJECTIVES
Upon successful completion of this course, students will be able to
1) explain the fundamental types of network and the various elements that constitute a client/server network;
2) evaluate different networking standards and models;
3) describe the Open Systems Interconnection(OSI) Model;
4) describe signaling techniques used on modern networks for transmission;
5) identify the different network hardware devices;
6) design various physical and logical topologies;
7) discuss the importance of a network operating system and the role that the active directory plays;
8) identify the differences between a UNIX, Linux and a Mac OS;
9) discuss the advantages and disadvantages of Novell NetWare operating system; and
10) describe the Transmission Control Protocol/Internet Protocol (TCP/IP) based network concepts.

COURSE CONTENT
I. Networking
   A. History and importance
   B. Categories
      i. Physical scope
      ii. Administrative methods
      iii. Operating systems
      iv. Protocols
      v. Topology
      vi. Architecture
   C. Model and standards
      i. Regulatory bodies
      ii. Specifications
   D. Communication methods
      i. Signaling
      ii. Media access
   E. Elements of a client/server network
F. Linking LANs to WANs
   i. Ethernet
   ii. Token ring
   iii. Fiber Distributed Data Interface (FDDI)
   iv. Apple Talk
   v. Topologies
   vi. Hardware
   vii. Switching types
   viii. Connectivity

II. Network Standards Organisation
    A. International Standards Organisation (ISO)
    B. American National Standards Institute (ANSI)
    C. Institute of Electrical and Electronic Engineers (IEEE) Networking Specification
    D. Consultative Committee for International Telephone and Telegraph/International Telecommunication Union (CCITT/ITU)

III. Transmission Media
    A. Common media characteristics
    B. Wired
       i. Coaxial cable
       ii. Twisted-pair cable
       iii. Fiber-optic cable
    C. Wireless
       i. Microwave
       ii. Radio
       iii. Infrared

IV. Network Protocols
    A. TCP/IP protocol suite
    B. Netware protocols
    C. NetBOIS and NetBEUI
    D. Apple Talk

V. Network Hardware
    A. NIC
    B. Repeaters and hubs
    C. Bridges
    D. Routers
    E. Gateways
    F. Switches

VI. Topologies
    A. Simple
    B. Hybrid
    C. Ethernet
D. Token ring
E. FDDI

VII. Access Methods
A. Switching
B. ATM
C. Wireless networks

VIII. WAN, Internet Access, and Remote Connectivity
A. WAN essentials
B. WAN topology
C. Public Switched Telephone Network (PSTN)
D. X.25 and frame relay
E. Digital Subscriber Line (DSL)
F. Broadband cable
G. Synchronous Optical Network (SONET)
H. Wireless WAN’s and internet access
I. Virtual Private Network (VPN)

IX. Networking Operating Systems (NOS) and Window Server
A. Introduction
B. NOS services and features
C. Window server hardware requirements
D. Planning
   i. Installation
   ii. Configuration

X. Networking with UNIX-Type Operating Systems
A. History
B. UNIX dialects
   i. Debian
   ii. Fedora
   iii. Red hat LINUX

XI. Netware-Based Networking
A. Server hardware requirements
B. Planning
   i. Installation
   ii. Configuration
C. Client services

XII. TCP/IP Networking
A. Designing TCP/IP-based networks
B. Mail services
C. Voice Over Internet Protocol (VOIP)
D. Additional TCP/IP Protocols
XIII. Integrity and Availability
   A. Virus protection
   B. Designing fault tolerance networks
   C. Data backup
   D. Disaster recovery

ASSESSMENT
Tests 30%
Homework/Assignments 15%
Project Portfolio/Term Paper 25%
Final Examination 30%
Total .................................................. 100%

REQUIRED TEXT

SUPPLEMENTARY READINGS/MATERIALS


JOURNALS
IEEE Network Magazine
Journal of Communications and Networks
Mobile Networks and Applications
Network Magazine Online

WEBSITES
www.pcguidebook.com
www.itp-journals.com
www.watchit.com