Module Title:	**Network & Internet Technology**
Module ID:	**CAP 240**
Prerequisite:	**PHYS 104**
Level:	**4**
Credit Hours:	**3 (3+0+1)**

Module Description:

Definition of computer networks, objectives and applications. Computer network types; LANs, PANs, MANs and WANs. Computer network architecture: layering, protocols &standard models. The ISO OSI & TCP/IP reference models. Physical layer of computer network: The transmission media; signal types, signal characteristics and impairments, modulation techniques and modems. Data Transmission Basics: Synchronous and asynchronous transmission, synchronization levels; bit, character and frame. Transmission Modes; full, half-duplex, simplex, parallel & serial. Data Link layer: Data link layer functions & standards. Local Area Networks: Topology and media access methods. LAN protocols and the IEEE 802 standard, Ethernet and IBM token ring LANs. Wireless LANs. WANs & Data Transport Networks, ATM & ISDN. Comprehensive coverage of Internet technologies, Web authoring, WWW Client/ Server architecture, HTML.

Module Aims:

- Familiar with OSI layered communication architectures.
- Learn the fundamentals of data transmission principles: time and frequency representation of signals, relation between data rate and channel bandwidth, and transmission impairments.
- Identify and characterize the various transmission media.
- Identify and characterize the various data encoding techniques.
- Understand the concepts of error detection techniques.
- Recognize how to share a channel by using medium access control protocols.
- Become familiar with Ethernet and IEEE standards.

- Become familiar with wireless networks.
- Compare between virtual circuit and datagram networks.
- Apply and evaluate routing algorithms.
- Describe Internet protocol (IP) specification and operation.
- Recognize transport layer services, designs, protocols and performance.
- Understand the concepts of reliable data transfer.

Learning Outcomes:

The student will gain knowledge and understanding of:

- Network architecture and the OSI reference model
- Transmission media
- Transmission Impairments
- Data encoding
- Error Detection
- Medium Access control Protocols and standards
- LAN standards & Devices
- Wireless networks
- Internet Protocol (IP)
- Routing Algorithms
- Transport Layer Protocols: TCP and UDP
- Reliable Data Transfer
- Internet Applications

List of Topics	No. of Weeks	Contact Hours
INTRODUCTION TO COMPUTER NETWORKING	2	6
OSI MODEL	1	3
PHYSICAL MEDIA	1	3
UTP AND FIBER CABLING	1	3
LAN TECHNOLOGIES	1	3
WIRLESS LAN	1	3
WAN TECHNOLOGIES	1	3
INTERNET PROTOCOL	1	3
WAN TECHNOLOGIES	2	6

ROUTING	1	3
ENTERPRISE NETWORK IMPLEMENTATION	1	3
INTERNET APPLICATIONS	1	3
REVIW	1	3

Textbook:

Data Communications & Networking , Behrous Forouzan , McGraw Hill 2007

James F. Kurose, and Keith W Ross, Computer Networking: A Top-Down Approach, Addison-Wesley, 2012.