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

**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

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| List of Topics | No. ofWeeks | 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.