**COMPUTER NETWORKING 3 Credits**

**Course Description**

Computer networking concerns issues on efficient linkage of computers for data exchange. It encompasses the storage, processing and transfer of data (i.e. digital information) between two entities. The entities can be machines, software processes or human beings. Competence in computer communication networks is very fundamental for graduates of ICT. This course is complementary to, and builds upon the fundamental principles introduced in COMS202 Data Communications. Hence, topics treated include networking interconnectors, network layer protocols and mechanisms, transport layer protocols and mechanisms, application layer protocols and mechanisms and network and computer security. Students engage in a case study of networks (i.e. LANs) as an aid to understanding the principles taught. This provides a solid foundation for advanced level courses in networking.

**Course Objective**

1. Understand and apply the basic terminology and principles of computer communication networks, especially issues relating to the layers 3 to 5 of the TCP/IP (or 3 to 7 of the ISO/OSI) reference model
2. Recognize and understand the basic principles, components and protocols of higher layers of computer networks
3. Differentiate between the basic networking technologies and protocols for LAN, MAN and WAN as well as their specific protocols.
4. Apply basic computer networking principles to the analysis, evaluation and design of an enterprise computer network for a client who has ambiguously specified the requirements of the network.
5. Demonstrate professional skills such as logical reasoning, teamwork, punctuality and efficient communication of technical concepts.

**Course Content**

Introduction of Networking models, Understanding the meaning of computer networking, Know the various applications of computer networking, Know, and understand the various networking models

Know and understand network Software, Know and understand Protocol hierarchies, Know and understand the 7-layer OSI model, Know and understand the TCP/IP model, Know the difference between the 7-layer OSI model and the TCP/IP models.

Switching techniques, Know and understand the meaning of switching, Know the different types of switching systems, Know their pros and cons.

Connection- Oriented networks. Know and understand the term Connection- Oriented networks, Know the types of Connection- Oriented networks, know their data rates and where they Are employed.

Routing algorithm. Know the different types of routing algorithm, Link state, Distance-Vector, Hierarchical Routing, Know their pros and cons.

Transmission Media. Understand the term transmission media, Know the difference types of transmission media, Know the difference between guided and unguided transmission media. Know the pros and cons of the various media types.

Network and file Protection. Data aback-up as Security measure, Network Security, Network hardening using firewalls.

Network Security. Plaintext, Encryption and decryption, Cyphers, DES, AES.

**Mode of Delivery**

Lectures

**Reading Materials**

Andrew Tanenbaum, Computer Networks, Prentice Hall PTR, 4th ed. or later

Behrouz A. Forouzan, Data Communications and Networking, 4 edn. or later, McGraw Hill

James Kurose and Keith Ross, Computer Networking: A Top-Down Approach, Addison Wesley, 2009.

William Stallings, Business Data Communications, 6/e, Prentice Hall, 2008.

William Stallings, Data and Computer Communications, 9/e, 2010

James E. Goldman, Applied Data Communications, 2nd Edition, 2004