**Debre Markos University**

**Debre Markos Institute of Technology (DMiT)**

**School of Electrical and Computer Engineering**

**Course Outline**

**Course Name**: Advanced Computer Networks

**Course Code**: ECEg5201

**Pre-requisites**: Data Communication and Computer Networks

**Target Groups**: 5th year Computer and Communication Stream Students

**Course in Charge**: Amare Mekonnen ([amaremek@gmail.com](mailto:amaremek@gmail.com), Building 701-Ground Floor, Room-2)

**Course Objectives:**

After completion of this course, students should be able to understand

* Networking Architectures and Models. Forming of various direct link Networks and recovery. How WAN operates and the use of Packet switching and routing table.
* The protocols and hardware related to internetworking & routing
* Strong knowledge of various WAN technologies
* Various Network Design and Security
* The major systems and services operating over Wide Area Networks
* Introduction to Socket programming

**Course Contents**

**Chapter One Physical Layer and Data Link Layer Brief Overview**

Introduction, Services, Error Detection and Correction, Error Control, Flow Control, LAN protocols, structure and the systems in Ethernet and Wireless LANS

**Chapter Two Network Layer and Transport Layer**

Introduction, Contents of a Router, Routing Algorithm, Routing Protocols, IPv6, the internet transport Protocol (TCP), UDP, Congestion control Algorithms, Introduction to Multi-Protocol Label Switching (MPLS)

**Chapter Three Basics of Application layer and Application Protocols**

HTTP, FTP, DNS (Domain Name System), electronic mail (SMTP, POP3, IMAP), Socket Programming with TCP and UDP, practicing programs

**Chapter Four Network Management**

Overview of the issues of network management, Use of passwords and access control mechanisms, Domain names and name services, Issues for Internet service providers (ISPs), Layers of network management Infrastructure for network management, the key areas of network management (accounting, security, configuration, performance, and fault tolerance) the Internet management framework and protocols (SNMP)

**Chapter Five Introduction to Network Security**

Possible threats and their nature, mechanisms for securing network resources

**Teaching and Learning Methods**: Lectures supported by tutorials and Laboratory

**Assessment/Evaluation & Grading System:** Assignments, Tests, Quizzes and Final examination

**References:**

1. A S Tannenbaum, “ Computer Networks" Prentice Hall of India Publication, 5th edition
2. Kuros, Ross, “Computer Networking A Top-down Approach”, Pearson Publishing, 6th edition