**ACMP 271- Foundations of Data Communication and Networks**

**Course outline**

**Course Aim and/or Objective**

The course is designed to give practical knowledge of the fundamental principles of modern data communications with a focus on physical layer of the network protocol stack. Class discussion complements a series of lab experiments. The course provides practical knowledge of the optical, wireless and wire cable data communication systems relevant to digital data communications, and provides hands-on experience by performing a series of laboratory experiments with a number of important laboratory instruments.

**Course Description**

Communication concepts. Bit and Baud rates. Synchronous, parallel and serial transmission modes. Modulation and demodulation. Communication protocols and architecture. Network topologies; bus, star, ring and hierarchical set ups. Basic TCP/IP, Messages, circuit and packet switching. Examples of standard network architecture.

**Learning Outcomes**

1. Identify and discuss the basic components of data communications, data networking, and the Internet.
2. Describe protocol architecture, TCP/IP, and Internet-based applications.
3. Explain data transmission, guided and wireless transmission.
4. Analyze and describe Local Area Networks and Wide Area Networks.
5. Evaluate communications architecture and protocols.
6. Describe digital encoding techniques and digital data communication techniques.

**Course Outline**

Topic 1: Concepts & terminology

Topic 2: Analog & Digital signals

Topic 3: Terminal devices i.e. modems, service units etc

Topic 4: OSI model

Topic 5: Protocols

Topic 6: Multiplexing

Topic 7: Network architecture

Topic 8: Packet/Circuit switching

Topic 9: Wireless

CATS: 4th and 9th Weeks = 30%. EXAM: 70%

**References**

1. Data & Computer networks, Prakash Gupta
2. William Stallings, Data & Computer networks 8th edition
3. Any other data communication and networking relevant books, journals, articles e.t.c