Communication System Engineering
MIE 113

Semester: First   **Full Marks: 75**
Credit Hour: 3   **Internal: 30**
                                                         Final Exam: 45

General Objective:

- To make students familiarize with the detailed concept of communication system engineering so that they will be able analyze and design such systems.

Specific Objectives:

The specific objectives of this unit are;

- to understand the key theoretical concepts in communications system engineering,

- to be familiar with the working of the various types of commonly used communication systems,

- to be able to design some of the communication systems

COURSE CONTENTS

Unit 1: Theoretical Concepts in Communications Systems Engineering.   20 Hrs

Elements of a generic communications system/digital communication system and various issues associated with each element, Comparison between analog and digital communications systems, Nyquist sampling theorem for analog to digital conversion, Waveform Coding Techniques:PCM,DPCM,ADPCM,DM,ADM, Baseband Shaping for Data Transmission: Unipolar, Polar, Bipolar signals-NRZ,RZ,Manchester and AMI format, Analog Modulation Techniques-time domain and frequency domain analysis, Digital Modulation Techniques, Evaluation of System performance: SNR and BER, Information and Entropy, Source Coding theorem, Huffman coding, Shannon's Channel Capacity Theorem, Error-Control Coding: rational for coding and types of codes, linear, block codes,error detection and correction, convolutional codes, Multiplexing, Emerging Trends in Modulation, Error control coding and multiplexing.

Unit 2 Communications Systems   15 Hrs

Terrestrial Microwave and Satellite communication systems, Cellular Mobile Communication Systems; GSM,CDMA, WiMax, Optical Fiber Communication System.

Unit 3 Designing a Communication System.   **10 Hrs**

Design of a terrestrial microwave system, Design of an optical fiber communications system, Design of a cellular communications network.