SEMESTER	***DEPARTMENT***	***COURSE TITLE***
Sixth	*Telecommunications Engineering*	*Digital Communications*
COURSE CODE	***HOURS*** 3	***COURSE SPECIFICATIONS***
ET607	***UNITS*** 3	*Theoretical Content*

1. ***Sampling theorems:***
   - Sampled data and the Sampling Theorem.
   - Basic concept of Nyquist rate applications, aliasing, and chopper sampling.
   - The fundamentals of ideal and practical samplings.
   - Reconstructing signals from their samples.

2. ***Basic types of pulse modulation (PAM, PWM and PPM):***
   - Principles of Pulse Amplitude Modulation PAM and its generation.
   - Bandwidth calculations in PAM.
   - Basic concepts of PAM demodulation circuits.
   - Principles of Pulse Width Modulation PWM and Demodulation circuits.
   - Bandwidth calculations in PWM.
   - Principles of Pulse Position Modulation PPM and Demodulation circuits.
   - Bandwidth calculations in PPM.

3. ***Pulse Code Modulation and Delta Modulation (PCM & DM) and their applications:***
   - Principles of PCM generation and reconstruction.
   - Explain the stages of a basic block diagram of PCM generator.
   - Explain the stages of a basic block diagram of PCM receiver.
   - Quantization and quantization noise.
   - Basics of DM and its applications.

4. ***Time Division Multiplexing (TDM):***
   - Principals of TDM.
   - Applications of TDM in digital systems.
   - Multiple-stage multiplexing.
   - TDM Demultiplexing.

5. Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), and (PSK):

- Explain the format concept of ASK, FSK, and PSK.
- Explain the differences between the ASK, FSK, and PSK.
- Digital transmission and coding (Non return to zero NRZ, return to zero RZ and Manchester coding).

6. Information rate and channel capacity:

- Explain the entropy as the basic measure of information.
- Explain the meaning of information rate.
- Relationship between the channel capacity and information rate.
- Identify the codes used in computers.
- Explain Parity Checking, Error Detection, and Error Correction.
- Appreciate the Hoffman code and Hamming code.

References:

1. George Kennedy and Bernard Davis. ***Electronic Communication Systems***, McGraw-Hill Book Company, Inc.
2. Paul H. Young. ***Electronic Communications Techniques***, Prentice Hall.
3. A. Carlson, Paul Crilly, and Janet Rutledge. ***Communication Systems***, McGraw-Hill Book Company, Inc.