

### Digital Communication (ID) (EC – 4001)

Course Code	(ID) EC-4001	Credits-4	L – 3, T-1, P-0
Name of the Course	Digital Communication		
Lectures to be Delivered	52 (1 Hr Each) (L= 39, T = 13 for each semester)		
Semester End Examination	Max. Marks: 100	Min. Pass Marks: 40	Maximum Time:3hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max. Marks: 50

#### Instructions

- For Paper Setters:** The question paper will consist of five sections A, B, C, D, and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 40% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each section will carry 15% of the total marks of the semester end examination for the course.
- For Candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

#### Section A

**Analog to Digital Conversion:** Noisy communication channels, the sampling theorem, low pass signals and band pass signals, pulse amplitude modulation, channels bandwidth for a PAM signal. Pulse amplitude modulation, sampling, signal recovery and holding, Quantization of signal, Quantization error, pulse code modulation (PCM), Delta Modulation, adaptive delta modulation.

#### Section B

**Digital modulation techniques:** Binary phase shift keying, differential phase shift keying, Differential encoded PSK, quadrature PSK, Quadrature Amplitude shift keying (QSK) Binary frequency shift keying.

#### Section C

Data transmission: A baseband signal receiver, probability of error, the optimum filter, white noise- the matched filter, probability of error of the matched filter, coherent reception: correlation, correlation receiver for Q.PSK.

#### Section D

**Noise in Pulse code and Delta Modulation systems:** PCM transmission, Calculation of quantization noise, the O/P signal power, the effect of thermal noise, O/P signal to noise ratio in PCM, Delta modulation, Quantization noise in Delta modulation, the O/P signal to quantization noise ratio in delta modulation, O/P signal to noise ratio in delta modulation.

**Computer Communication System:** Introduction, types of networks, Design features of computer communication network. Examples of Digital communication: ISDN, LAN, pocket radio and satellite, ATM, etc.

#### Books:

- Taub and Schilling, Principles of Communication systems (East West Press)
- John R. Freer, Principles of Communication an Network