

Digital communication and Probability

Course Title	Digital communication and Probability
Course Category	Pedagogy
Relevant Discipline(s)	Electrical, Electronics and Communication Engineering
Duration of course	4 days
Proposed dates	Each slot of 3:30 Hrs below consists of 2 sessions of 1:30 Hrs each and a 30 mins break November 28: 5:00-8:30pm November 29: 10:00 am – 1:30 pm, 3:30-7:00 pm, December 5: 5:00-8:30pm December 6: 10:00 am – 1:30 pm, 3:30-7:00 pm December 12: 5:00-8:30pm December 13: 10:00 am – 1:30 pm

Brief Course Description and Course Contents

Course description:

In this course, we will cover some topics that form the foundation of a UG/PG course on Digital Communication and Probability. In addition to covering the key concepts from digital communication, we will also discuss some important topics from probability that are essential for a thorough study of digital communication. The course will have theory lectures, some hands-on numerical / simulation component, and pedagogical methodology for teaching such a course to undergraduate and postgraduate students.

Course content:

The following topics, together with suitable pedagogical aspects, will be covered in the course.

Sampling and interpolation, quantization, vector quantization, Lloyd-Max algorithm, digital modulation techniques, matched filter receiver, probability of error analysis, union bound,

Information theory: entropy, mutual information, channel capacity, source compression: Huffman codes, Lempel-Ziv codes, error correction techniques: parity check code, repetition codes, Hamming codes.

Probability, random variables, distribution, expectation, conditional probability and conditional expectation, law of large numbers, central limit theorem, Markov, Chebyshev, and Chernoff bounds, random processes, stationarity, autocorrelation function, power spectral density, white noise.

Instructor Details			
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