

ENG307 Digital Communications

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

Synopsis:

This course provides a comprehensive introduction to basic principles and fundamental theories of digital communication. Some important concepts are covered such as power spectral density and energy spectral density of signals, digital signaling technique, Inter-symbol interference, various modulation schemes and probability of error etc.

This course is intended to develop an understanding of the fundamental principles of digital communication systems, help students accumulate knowledge and lay a good foundation for future and further studies or application in engineering fields of digital communications.

Topics:

- Introduction to Analogue and Digital Communications
- Signals and Spectra
- Probability and Random variable
- Random Process
- PAM & PCM
- Digital Signaling
- Complex Envelope Representation of Signals
- Bandpass signaling
- Analogue Modulation
- Digital Modulation
- Spread Spectrum
- System Performance

Textbooks:

Couch, L.: Digital and Analog Communication Systems (eTextbook) 8th Edition Prentice Hall Pearson. (2007)

ISBN-13: 9780273774228-AA

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Learning Outcome:

- Examine the fundamentals of digital communication systems such as entropy, channel capacity, etc.
- Solve for the parameters of described random process.
- Analyze signals based on its spectra and compute the corresponding autocorrelation function and power spectral densities.
- Sketch binary signal waveforms, base-band signals and pass-band signals.
- Compute the digital communication system parameters such as bit rate, baud rate, raised cosine-rolloff factor, detection threshold etc.
- Use probability and statistical models to study digital communication signals and systems.
- Rate the different modulation schemes and bit error performance of digital communication systems.
- Verify the signal characteristics and functions of simple digital communication subsystems through computer simulations.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
CLASS TEST	10
CLASS TEST	10
LAB TEST	10
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**