

EE-3005 SIGNALS AND SYSTEMS

COURSE OBJECTIVE

This course introduces students about the signals and systems mathematically and understands how to perform mathematical operations on them.

COURSE CONTENT

Classification of signals and systems: Continuous time signals (CT signals), Discrete time signals (DT signals) - Step, ramp, pulse, impulse, sinusoidal and exponential signals, basic operations on signals, classifications of CT and DT signals- Periodic and aperiodic signals, energy and power signals, random signals, CT systems and DT systems, basic properties of systems, basic properties of systems, linear time invariant systems and properties.

Analysis of continuous time signals: Time and frequency domain analysis, Fourier series analysis, spectrum of CT signals, Fourier transform and Laplace transform, region of convergence, wavelet transform.

Linear time invariant continuous time systems: Differential equations representation, block diagram representation, state variable representation and matrix representation of systems, impulse response, step response, frequency response, reliability of systems, analog filters.

Analysis of discrete time signals: Convolution sum and properties, sampling of CT signals and aliasing, DTFT and properties, Z transform and properties, inverse Z transform.

Linear time invariant discrete time systems: Difference equations, block diagram representation, impulse response, analysis of DT LTI systems using DTFT and Z transform, state variable equations and matrix representation of systems, Digital filters.

COURSE OUTCOME

Student after successful completion of course must possess an Understanding of various signals and systems properties and be able to identify whether a given system exhibits these properties and its implication for practical systems.

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES

1. Alan V. Oppenheim, Alan S. Willsky, S Hamid Nawab, 'Signals and Systems', 2 ed 2015 Pearson New International Edition
2. A. Anand Kumar, Signals and Systems, PHI, III edition, 2015
3. Mahmood Nahvi, Signals and Systems, McGraw Hill
4. Simon Haykins and Barry Van Veen, Signals and Systems, Wiley India
5. A. Nagoor Kani; 'Signals and Systems' McGraw Hill
6. Robert A. Gabel and Richard A. Roberts, Signals & Linear Systems, Wiley.
7. Rodger E. Ziemer, William H. Tranter, D. Ronald Fannin. Signals & systems, Pearson Edu.