

EEE404-Digital Systems and Signal Processing

Course Content

1. Introduction

- Signals, Systems, and Signal Processing
- **Classification of Signals**
- The Concept of Frequency in Continuous-Time and Discrete-Time Signals
- Analog-to-Digital and Digital-to-Analog Conversion

2. Discrete-Time Signals and Systems

- Discrete-Time Signals
- Discrete-Time Systems
- Linear Time-Invariant Systems
- Properties of Linear Time-Invariant Systems

3. Frequency Analysis of Signals

- Frequency Analysis of Continuous-Time Signals
- Frequency Analysis of Discrete-Time Signals

4. Sampling of Continuous-Time Signals

5. Transform Analysis of Linear Time-Invariant Systems

- The Frequency Response of LTI Systems
- Frequency Response for Rational System Functions
- Minimum-Phase Systems

6. Structures for Discrete-Time Systems

- Block Diagram Representation of Linear Constant-Coefficient
- Difference Equations
- Structures for the Realization of Discrete-Time Systems
- Structures for FIR Systems
- Structures for IIR Systems

7. Design of Digital Filters

BOOKS:

1. Proakis John G and Manolakis Dimitris G, Digital Signal Processing: Principles, Algorithms and Applications, Prentice-Hall, 2006.
2. Alan V. Oppenheim and Ronald W. Schaffer: Discrete-Time Signal Processing (Prentice-Hall Signal Processing Series)
3. Mitra, Sanjit K, Digital Signal Processing : A Computer Based-Approach, 4th Edition, McGraw-Hill, 2011