

<b>SEMESTER</b> <i>Eighth</i>	<b>DEPARTMENT</b> <i>Telecommunication Engineering</i>	<b>COURSE TITLE</b> <i>Digital Signal Processing</i>
<b>COURSE CODE</b> <i>ET801</i>	<b>HOURS:</b> 3 <b>UNITS:</b> 3	<b>COURSE SPECIFICATIONS</b> <i>Theoretical Content</i>

**1. Concepts' Revision:**

- Revision of Fourier Series Analysis.

**2. Main Contents:**

- Introduction to Discrete-Time Signals and Systems.
  - Convolution Property.
  - Difference Equations.
- Fourier Transforms and Frequency Response.
- The Discrete Fourier Transform and Frequency Response.
- Z-Transform and Inverse Z-Transform.
- Sampling and Reconstruction.
- Important Types of LTI Systems.
- Multirate Signal Processing
  - Up sampling.
  - Down sampling.
  - Resampling Filters.
- Finite Impulse Response Filter.
  - Structures for FIR Filters (Direct and Cascaded forms).
  - FIR impulse & frequency responses.
  - FIR filter design.
- Infinite Impulse Response Filter Design.
  - Structures for IIR Filters (Direct and Cascaded forms).
  - IIR impulse & frequency responses.
  - IIR filter design.

**3. Applications of Digital Signal Processing such as:**

- Low Pass Filter Design.
- Echo canceller.
- Noise Canceller in Communication Channels.
- Channel Equalization Using Digital Filters.
- Filtering of Noisy Audio Signals.
- Extracting a Desired Signal from Two Combined Signals.

**References:**

1. Sanjit K. Mitra, *Digital Signal Processing - Computer Based Approach*, McGraw-Hill, 2<sup>nd</sup> ed.
2. V. K. Ingle and J. G. Proakis, *Digital Signal Processing Using MATLAB V. 4.* , PWS Publishing Company, 1997.