SEMESTER	*DEPARTMENT*	*COURSE TITLE*
Eighth	*Telecommunication Engineering*	*Digital Signal Processing*
COURSE CODE	*HOURS:* 3	*COURSE SPECIFICATIONS*
ET801	*UNITS:* 3	*Theoretical Content*

1. **Concepts' Revision***:*

➢ Revision of Fourier Series Analysis.

2. *Main Contents:*

➢ Introduction to Discrete-Time Signals and Systems.

    o Convolution Property.

    o 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

    o Up sampling.

    o Down sampling.

    o Resampling Filters.

➢ Finite Impulse Response Filter.

    o Structures for FIR Filters (Direct and Cascaded forms).

    o FIR impulse & frequency responses.

    o FIR filter design.

➢ Infinite Impulse Response Filter Design.

    o Structures for IIR Filters (Direct and Cascaded forms).

    o IIR impulse & frequency responses.

    o 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, 2nd ed.

2. V. K. Ingle and J. G. Proakis, *Digital Signal Processing Using MATLAB* V. 4. , PWS Publishing Company, 1997.