SEMESTER	***DEPARTMENT***	***COURSE TITLE***
Fourth	*General Engineering*	*Linear Systems*
COURSE CODE	***HOURS:*** 3	***COURSE SPECIFICATIONS***
EG408	***UNITS:*** 3	*Theoretical Contents*

1. ***Introduction to Linear Systems:***
   - Signals and classification of signals.
   - Systems and classification of systems.
2. ***Discrete Time Systems:***
   - Properties of discrete time LTI systems.
   - Linear difference equations.
   - The Frequency Response of Discrete Time Systems.
   - Convolution sum and Impulse response.
   - State variables.
3. ***The Z-Transform :***
   - Introduction.
   - Properties of z- transform.
   - Rational z-Transforms.
   - Inversion of z- transform.
   - Analysis of discrete time LTI systems using z-transform.
4. ***Continuous Time Systems:***
   - Linear Differential Equations.
   - Properties of continuous time systems.
   - Convolution Integral
   - State variables.
5. ***Laplace Transform:***
   - Introduction.
   - Inversion of Laplace Transform.
   - Solution of Differential equations by using Laplace transform.
   - Analysis of electrical networks.

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6. ***Fourier Analysis of Continuous-Time LTI Systems:***

- Fourier series representation of periodic signals.
- Fourier transform.
- Properties of the continuous time Fourier transform.
- Frequency response of continuous time LTI systems.
- Filtering.

7. ***Fourier Analysis of Discrete-Time LTI Systems:***

- Discrete Fourier series.
- The frequency response of DLTI systems.
- Sampling Theorems.
- Fast Fourier transform.

References:

1. Hwei P. Hsu, ***SCHAUM'S OUTLINES OF: Theory and Problems of Signals and Systems***, McGraw hill
2. B. P. Lathi, ***Signal Processing and Linear Systems,*** Berkeley Cambridge Press.
3. ***Signals and Linear Systems***, Gabel & Roberts.