

## **FMCC 403 MATHEMATICAL METHODS (3-1-0)**

### **Module-I (12 Hours )**

Laplace Transform: Definition, Notation, Some simple transform, existence of Laplace transforms, Inverse Laplace Transform

Laplace transform of Derivatives, Transform of integrals, solution of differential equation using Laplace transforms, solution of simultaneous differential equation using Laplace transforms.

Unit step function and its LT, Heaviside step function, 1<sup>st</sup> shifting theorem and 2<sup>nd</sup> shifting theorem, impulse function and its LT.

### **Module-II (14 Hours )**

Z Transform: Definition and Notation, Linearity property of z transform, 1<sup>st</sup> shift property, 2<sup>nd</sup> shift property , Inverse z transform. Difference equation, Solution of Difference equation using Z transform,

Z transform function, Impulse response, Stability, convolution, Relation between Laplace transform and Z transform

### **Module-III (14 Hours )**

Fourier transform: Fourier integral, Fourier Transform, Linearity property, Differentiation, Time Shift Frequency shift and symmetry property of Fourier Transform, Relation between LT and FT

Fourier transform of step and impulse function, Convolution

Fourier transform of sequence, discrete FT, Estimation of the continuous FT, The fast Fourier Transform

#### **Text Books:**

1 .Advanced Modern Engineering Mathematics (3<sup>rd</sup> Edition) By Glyn James , (Pearson Education)

Chapter 2.1,Ch-2.2.1 to 2.2.9, Ch-2.3.1 to 2.3.4, Ch-2.5.1 to2.5.4, 2.5.8 to 2.5.10

Chapter-3.1, Ch-3.2.1 to 3.2.3, Ch-3.3.1 to 3.3.5, Ch-3.4.1, ch-3.5.1 to 3.5.3, Ch-3.6.1 to 3.6.5, ch-3.7

Chapter 5.1, Ch-5.2.1 to 5.2.4, Ch-5.3.1 to 5.3.6, Ch-5.4.1 to 5.4.3, Ch-5.5.1 to 5.5.3, Ch-5.6.1 to 5.6.6