

# **MT-224 Complex Variable & Fourier Analysis**

## **Infinite Series:**

Application of convergence tests such as comparison, Root, Ratio, Raabe's and Gauss tests on the behavior of series.

## **Complex Variable**

Limit, continuity, zeros and poles of a complex function. Cauchy-Reimann equations, conformal transformation, contour integration.

## **Laplace Integral & Transformation**

Definition, Laplace transforms of some elementary functions, first translation or shifting theorem, second translation or shifting theorem, change of scale property, Laplace transform of the  $n$ th order derivative, initial and final value theorem Laplace transform of integrals, Laplace transform of functions  $t^n F(t)$  and  $F(t)/t$ , Laplace transform of periodic function, evaluation of integrals, definition of inverse Laplace transform and inverse transforms, convolution theorem, solutions of ordinary differential and partial differential equations using Laplace transform (I.V.P's & B.V.P's).  $Z$  and Inverse  $Z$  – transformations, properties of  $Z$  - transformation and applications.

## **Fourier series**

Introduction to Fourier series. Euler Fourier formulae, even and odd functions, application of Fourier series. Fourier transform and fast Fourier transform and properties with applications.

## **Recommended Books**

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| 1. Advance Engineering Mathematics                     | Erwin Kreyszig  | Seven Edition |
| 2. Differential Equation                               | G. Zill         |               |
| 3. Complex Analysis for Mathematics<br>and Engineering | John H. Mathews | 2001          |
| 4. Calculus & Analysis Geometry                        | Howard Anton    | Fifth         |