Semester III
MA 211

Fourier series, Fourier Transform and Laplace Transform:

1. Periodic functions – Fourier series of periodic functions with period 2π – point wise convergence of Fourier series – Fourier series of periodic functions with arbitrary period T– Fourier series of even and odd periodic functions – Fourier series of functions defined over finite interval – full range series – half-range series.

2. Fourier integral – Fourier transform pair – properties of Fourier transform –linearity, change of scale, translation and modulation – Fourier transforms of derivatives – convolution theorem for Fourier transform – Fourier cosine and sine transforms.

3. Laplace transforms of elementary functions — existence of Laplace transform —properties of Laplace transform — linearity property, change of scale, translation (first shifting theorem) – Laplace transforms of derivatives and integrals – derivative of Laplace transform — applications of Laplace transform in solving ordinary differential equations — second shifting theorem — convolution theorem for Laplace transform.

<u>Text book</u>: 1. Advanced Modern Engineering Mathematics, Glyn James, Pearson Publisher.
<u>Ref. books</u>: 1. Advanced Engineering Mathematics, M. D. Greenberg.
          2. Advanced Engineering Mathematics, Jain, R. K. and Iyengar, S. R. K.
<u>Ref books on Fouries Series:</u>
    1. Differential Equations with Applications and Historical Notes, G.F.Simmons.
    2. Fourier Series and Boundary Value problems, J.W.Brown and R. Churchill

Instructor: Dr. Kaushik Mukherjee