I	Course Code	**MA 224003**
II	Course Title	**Integral Transforms and Applications**
III	Credit Structure	L T P C 3 0 0 3
IV	Prerequisite (If any)	Students should have basic knowledge of Calculus and Differential Equations
V	Course Content	**Laplace Transform:** Definition of Laplace Transform, linearity property, conditions for existence of Laplace Transform. First and second shifting properties, Laplace Transform of derivatives and integrals, unit step functions, Dirac delta-function, error function. Differentiation and integration of transforms, convolution theorem, inversion, periodic functions. Evaluation of integrals by Laplace Transform. Solution of initial and boundary value problems. **Fourier Series:** Periodic functions, Fourier series representation of a function, half range series, sine and cosine series, Fourier integral formula, Parseval's identity. **Fourier Transform:** Fourier Transform, Fourier sine and cosine transforms. Linearity, scaling, frequency shifting and time shifting properties. Self-reciprocity of Fourier Transform, convolution theorem. **Other Transforms (if time permits):** Brief Introduction of Z-Transform, Mellin transform and Wavelet Transform, Hilbert Transform, Radon Transform.
VI	Text/References	• B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi (2004). • Amarnath T., Elementary Course in Partial Differential Equations, Narosa Publ. House, New Delhi, 1997. • Debnath, Lokenath; Bhatta, Dambaru, Integral transforms and their applications. Second edition. Chapman & Hall/CRC, Boca Raton, FL (2007). • K. SankaraRao, Introduction to Partial Differential Equations, Prentice Hall India Learning Pvt. Ltd., Third Edition (2011). • M. D. Raisinghania, Advanced Differential Equations, S Chand Publishing