



Code	Subject Title	Cr. Hrs	Semester
PHY-307	Mathematical Methods of Physics-II	3	VI
Year	Discipline		
3	Physics		

Special functions, Hermite polynomial, Legendre and associate Legendre polynomial, Laguerre polynomial, Bessel function, Neumann function, Hankel function, Modified and spherical Bessel function, Gamma function, error function.

Fourier series, cosine and sine series, change of interval, Fourier integral, complex form of Fourier series, Fourier transform, Fourier transform of derivatives, convolution theorem, Laplace transform, Laplace transform of derivatives, applications of Fourier and Laplace transforms.

Boundary value problem in physics, boundary value problems and series solution, the Sturm-Liouville problem, non-homogeneous boundary value problem and Green's function, Green's function for one-dimensional problem, eigenfunction expansion of Green's function, Green's function in higher dimensions, Green's function for Poisson's equation, quantum mechanical scattering problem.

Book Recommended:

1. *Advanced Engineering Mathematics* by E. Kreyszig, Wiley, New York, 1999.
2. *Mathematical Methods for Physicists* by G. B. Arfken and H. J. Weber, A Press, New York, 1995.
3. *Mathematical Methods for Physics and Engineering* by K. F. Riley, M. P. Hobson and S. J. Bence, Cambridge University Press, 1997.