Annexure XVIII Syllabi of Common Courses at Second Year B. Tech.

MA201: Advanced Engineering Mathematics

Teaching Scheme			Credits	Marks Distribution				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	CE	ESE	CE	
4	0	0	4	70	30	0	0	100

Course Content:

Sr. No.	Topics	Teaching Hrs.
1	**Introduction to Some Special Functions:** Gamma function, Beta function, Error function and their properties.	08
2	**Laplace Transforms and Applications:** Definition of the Laplace transform, Inverse Laplace transform, Linearity property, Laplace transform of some standard functions, First Shifting theorem, Transforms of derivatives and integrals, solution to Differential equations, Differentiation and Integration of transforms, Unit step function, Second shifting theorem, Dirac's delta function, Convolution and integral equations.	15
3	**Fourier Series and Fourier integral:** Definitions of Sinusoidal Pulse function, Rectangle function, Gate function, Signum function, Saw tooth wave function, Triangular wave function, Half wave rectified sinusoidal function, Full rectified sine wave, Square wave function. Periodic function, Fourier series, Functions of any period, Even and odd functions, Half-range Expansion, Fourier integral.	12
4	**Ordinary Differential Equations and Applications:** Introduction of differential equations, Linear differential equations of higher order: Definition of Higher order linear differential equations, Higher order homogeneous with constant coefficients, Higher order non homogeneous equations with constant coefficients. Solution by [1/f(D)] r(x) method for finding particular integral. Finding particular integral using shortcut methods, Wronskian, method of variation of parameters, solution to Euler-Cauchy equations, and solution to Legendre's equation.	15

5	**Series Solution of Differential Equations:** Ordinary point, singular points, regular singular points, Power series method, Theory of power series methods, Frobenius method.	10
	Total Hrs.	**60**

Reference Books:

1. Grewal, B. S., Higher Engineering Mathematics, Khanna Publisher, New Delhi.
2. Kreyszig E., Advanced Engineering Mathematics, Wiley-India.
3. Boyce W. E. and Di Prima R., Elementary Differential Equations, John Wiley.
4. Bali N.P. and Manish Goyal, A Textbook of Engineering Mathematics, Laxmi Publications Pvt. Ltd.
5. Dass H.K. Advanced Engineering Mathematics, S. Chand Publishing.