Course Objectives: The objectives of offering this course are:

- To strengthen the analytical abilities of the students.
- To make strong foundation of the integral transforms and their inverses.
- To make students familiar with complex variable.
- To create zeal of working with higher mathematics in the widespread field of engineering.

16MA 103T MATHEMATICS-II										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	--	7	3	25	50	25	--	--	100

UNIT I **10**

Complex Analysis: Complex numbers, Function of a Complex variable, Analytic function, Cauchy-Riemann equations, Conformal mapping and its type, Some standard & special conformal mappings, Definition of a Complex line integral, Cauchy's integral theorem, Cauchy's Integral formula, Residue theorem, Calculation of residues, Evaluation of real definite integrals.

UNIT II **10**

Ordinary differential equation: Differential equations of first order and higher degree, Linear. independence and dependence of functions. Higher order differential equations with constant, coefficient, Rules for finding C.F. and P.I., Method of variation of parameter, and method of undermined coefficients, Cauchy and Legendre's linear equations, Linear differential equations of second order with variable coefficients; Simultaneous linear equations with constant coefficients. Various applications of higher order differential equations in solution of engineering problems, Orthogonal trajectories.

UNIT III **10**

Partial Differential Equations: Formation of P.D.E, Equations solvable by direct integration, Linear and non-linear equations of first order, Lagrange's equations. Homogeneous and non-homogeneous linear P.D.E. with constant coefficients. Rules for finding C.F. & P.I.

UNIT IV **09**

Laplace transforms: Piecewise continuous functions and exponential order functions, Definition, Existence and Properties of Laplace transform, unit step function and Heavyside function, Inverse laplace transform, laplace transform of derivative, Convolution theorem, Applications for solving differential equations.

APPROXIMATE TOTAL 39 Hours

Texts and References:

1. Complex variables and applications (7thEdition), R.V.Churchill and J.W.Brown, McGraw-Hill (2003)
2. Complex analysis, J.M.Howie, Springer-Verlag (2004)
3. Higher Engineering Mathematics, R. K. Jain & S. R. K. Iyernagar.
4. E.Kreyszig, Advanced engineering mathematics (8th Ed.), John Wiley (1999)
5. W.E.Boyce and R. DiPrima, Elementary Differential Equations (8th Ed.) John Wiley (2005)
6. Ordinary and Partial Differential Equations by M.D. Raisinghania, 8th edition, S. Chand Publication (2010)
7. Introduction to partial differential Equations, K Sankara Rao,PHI Learning pvt ltd.

Course Outcomes: On the successful completion of this course; student shall be able to

- Solve engineering problems using the principles of solution of differential equations.
- Understand analytic function of a complex variable and able to apply Cauchy integral theorem and residue theorem to solve contour integrations.
- Use Fourier transforms and it's inverse in practical applications of engineering.
- Apply Laplace transform and its inverse to solve initial value and other related problems.