Paper Code	THEORY	Credits:3
MT302	**Title: Differential Equations**	**45 L**
Unit 1	**Differential Equations of first order first degree**	**15 L**
	Variable separable form, homogeneous differential equations, Exact Equations and Integrating Factors, rules of finding integrating factors, linear differential equations, Bernoulli's equation	
Unit 2	**Second and higher Order Linear Differential Equations**	**15 L**
	Auxiliary equation, real and distinct roots, equal roots, complex roots of auxiliary equation. Particular solution, Undetermined Coefficient method, variation of parameters method.	
Unit 3	**Partial Differential Equations**	**15 L**
	Surfaces and Curves in three dimensions, solution of equation of the form $\frac{dx}{P}=\frac{dy}{Q}=\frac{dz}{R}$. Origin of first order and second order partial differential equations, Linear equations of the first order, Lagrange's method.	

References:

1. A.H.Siddiqi & P. Manchanda – A First Course in Differential Equation with Applications (Macmillian)
2. George. F. Simmons – Differential equation with applications and historical notes (Tata McGraw Hill)
3. Sankara Rao - Introduction to Partial Differential Equation,2nd edition, PHI.

Additional References:

1. E.A. Coddington - An Introduction to Ordinary Differential Equation, PHI.
2. W.E. Boyce & R.C. Diprima - Elementary Differential Equations and boundary value Problems, (Wiley India)
3. B. K. Dutta – Introduction to Partial Differential Equations (New Central Books)
4. Zafar Ahsan - Differential Equations and their Applications , 2nd edition, PHI

Paper Code	Practical	Credits:3
MP301	**Title: Practicals based on MT301 and MT302**	**45 L**
	Group A: Linear Algebra-I	
	1. Vector space and subspaces – examples 2. Finding the basis and dimension of a vector space. 3. Linear transformation – examples 4. Rank-Nullity theorem 5. Quotient space – examples 6. Finding basis and dimension of a quotient space.	
	Group B: Differential Equations	
	1. Solving first order linear equation using variation of parameters, integrating factors. 2. Solving linear differential equations, Bernoulli's equation. 3. Solving non-homogeneous differential equation with UDC method. 4. Solving non-homogeneous differential equation with variation of parameters method. 5. Surfaces and curves in three dimensions. 6. Solving linear first order partial differential equation.	