DEPARTMENT OF MATHEMATICS

Semester : II **Integrated M.Sc. Mathematics** **Academic Year : 2017-18**

Subject : 060090205 CC3 Advanced Calculus

Teaching Schedule

Course Objectives: To give Conceptual Knowledge of the Partial Differentiation and Vector Calculus with their implementation to resolve the real world problems.

Unit	Sub Unit	No. of Lect.(s)	Topics	Reference Chapter/ Additional Reading	Teaching Methodology to be used
Unit 1: Partial differentiation					**[10]**
1	1.1	5	Partial differentiation, Euler's theorem for homogeneous function	G.B. Thomas and R.L. Finney – "Calculus", Pearson Education, Delhi, 2005.	Chalk & Talk
	1.2	5	Modified Euler's theorem, Taylor's and Maclaurins series for two variables		
Unit 2: Applications of Partial Differentiation					**[16]**
2	2.1	4	Tangent plane and Normal line Error and Approximation	G.B. Thomas and R.L. Finney – "Calculus", Pearson Education, Delhi, 2005.	Chalk & Talk
	2.2	3	Jacobians with properties		
	2.3	4	Extreme values of function of two variables		
	2.4	5	Lagrange's methods of undetermined multipliers		
Unit 3: Vectors Functions					**[18]**
3	3.1	4	Vector and scalar, vector operations, differentiation of vector	G.B. Thomas and R.L. Finney – "Calculus", Pearson Education, Delhi, 2005.	Chalk & Talk
	3.2	4	Integration of vector, Vector function of a single scalar variable		
	3.3	4	differential operator, gradient, directional derivative		
	3.4	4	physical meaning of gradient, divergence		
	3.5	2	curl and Laplacian with their properties		
Unit 4: Vector calculus and its Applications					**[08]**
4	4.1	4	Line Integrals, Surface Integral, Volume integral	G.B. Thomas and R.L. Finney – "Calculus", Pearson Education, Delhi, 2005.	Chalk & Talk
	4.2	4	Green's, Gauss and Stoke's theorem without proof & application		

Text books:

1. G.B. Thomas and R.L. Finney – "Calculus", Pearson Education, Delhi, 2005.
2. Steward James, "Calculus - EARLY TRANSCENDENTALS", Thomson Asia, Singapore, 2003.

Reference books:

1. Maurice D. weir, Joel Hass, Frank R. Giordano, Thomas"Calculus", Pearson Education.
2. Bali and Iyengar, "Engineering Mathematics", Laxmi Publications, New Delhi, 1997.
3. Peter O. Neil., "Advanced Engineering Mathematics", Thompson, Singapore, Ind. Ed. 2002.
4. Kapur J. N., "Mathematical Models in Biology and Medicine", East west Press, New Delhi 1985.
5. Hilderband F. B., "Methods of Applied Mathematics", McGraw Hill, New York, 1968.