Advanced Calculus (MAL101)

Course no: MAL 101	Open course (YES/NO)	HM Course (Y/N)	DC (Y/N)	DE (Y/N)
	NO	N	N	N
Type of course	Theory			
Course Title	Advanced Calculus			
Course Coordinator	Dr. Prashant Kumar			
Course objectives:	This course is aimed to cover differential, integral and vector calculus for functions of one and more than one variable. These mathematical tools and methods are used extensively in physical sciences, engineering, and computer graphics.			
POs				

Semester: 1st	Autumn: Yes		Spring:		
	Lecture	Tutorial	Practical	Credits	Total Teaching Load
Contact Hours	3	1	0	4	48
Prerequisite course code as per proposed course numbers	Nil	Nil			
Prerequisite credits	Nil	Nil			
Equivalent course codes as per proposed course and old course	Nil	Nil			
Overlap course codes as per proposed course numbers	Nil	Nil			

Text Books:		
1.	Title	*Thomas' Calculus*
	Author	G. Thomas, M. Weir, J. Hass
	Publisher	Pearson Pub.
	Edition	2010
2.	Title	*Introduction to Real Analysis*
	Author	R.G. Bartle, D.R. Sherbert
	Publisher	John Wiley and Sons
	Edition	2011

Reference Book:		
1.	Title	*Advanced Engineering Mathematics*
	Author	E. Kreyszig
	Publisher	Jon Wiley and Sons
	Edition	2008

Content	**Unit I: Differential Calculus:** Limit and Continuity of functions; differentiability; Jacobian, Rolle's theorem; Mean value theorem; Taylor's and Maclaurin's theorems with remainders, Expansions; Convergence of sequences and series of real numbers; Power series; Functions of several variables, limit and continuity, Partial Derivatives and Differentiability, Maxima & Minima of two variables, Lagrange method of multiplier. (18 hours) **Unit II: Integral Calculus:** Fundamentals theorem of integral calculus, Riemann Integration, Improper Integrals, Double and Triple integrals-computation of surface area and volumes-change of variables in double and triple integrals. (14 hours) **Unit III: Vector Calculus:** Scalar and vector field; Vector differentiation; Level surfaces, Directional Derivatives, Gradient of Scalar field; Divergence and Curl of a vector field; Laplacian, Line and Surface integrals; Green's theorem in plane Gauss Divergence's theorem and Stoke's theorem. (16 hours)
Course Assessment	Continuous Evaluation 25% Mid Semester 25% End Semester 50%