SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2022-2023

Integrated Bachelor-Master Programme
(Integrated B.Sc.-M.Sc.) (Mathematics) Semester (I)

Course Code	IS01CMTH52	Title of the Course	PROBLEM SOLVING AND EXCERCISES IN CALCULUS
Total Credits of the Course	01	Hours per Week	02

Course Objectives:	1. This course is aimed at enhancing the skill of problem solving in mathematics. 2. To teach Calculus in more depth. 3. To teach Calculus of functions in two and three variables.

Course Content		
Unit	Description	Weightage* (%)
1.	Problems based on Hyperbolic Functions: Definition and Properties; Derivatives and Integrations of Hyperbolic Functions; Inverse Hyperbolic Functions and it's Derivative.	
2	Successive Derivative: Higher Order Derivatives; nth Derivatives of Standard Forms; Leibnitz's Theorem and its Applications.	
3.	Problems based on Indeterminate Forms: L'Hospital's Rule; $\frac{0}{0}, \frac{\infty}{\infty}, \infty - \infty, 0.\infty, 0^0, 1^\infty, \infty^0$ forms.	
4.	Problems based on Reduction Formulae for Integration of $sin^n x, cos^n x, sin^p x.cos^q x, tan^n x, cot^n x, sec^n x, cosec^n x$; Evaluation of Reduction Formulae using Properties of Definite Integration and applications.	
5.	Problems based on Function of Two Variables, Neighborhood of a Point in Plane; Partial Derivatives, Partial Derivatives of Higher Orders; Homogeneous Function; Euler's Theorem on Homogeneous Function of Two Variables and it's Corollaries.	
6.	Problems based on Theorems on Total Differentials; Differentiation of Composite Functions; Euler's Theorem on Homogeneous Function of Three Variables; Differentiation of Implicit Functions.	

Teaching-Learning Methodology	Classroom teaching, Presentation by students, Problem Solving in groups, Use of ICT whenever required.

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	----
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	30%
3.	University Examination	70%

Course Outcomes: Having completed this course,	
1.	Students will realize the power of Leibnitz's Theorem and L'Hospital's Rule.
2.	Students will be able to find areas and surface areas using basic Calculus.
3.	Students will be able to take courses of Calculus of multivariable functions.

Suggested References:	
Sr. No.	References
1.	Shanti Narayan, Differential Calculus, 14th Edition, S. Chand & Company Ltd., New Delhi, 1996 Chapter: 5, 6(6.6 Only), 9, 10, 12(12.1, 12.2, 12.3 Only)
2.	Shanti Narayan, Integral Calculus, 14th Edition, S. Chand & Company Ltd., New Delhi, 1996 Chapter: 4(Except 4.7, 4.8, 4.9), 8(Except 8.5)

On-line resources to be used if available as reference material
On-line Resources

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