

CALCULUS

Semester	Subject Code	Category	Lecture		Theory		Practical	Credits
I	21CMA2A	Core III	Hrs/week	Hrs/Sem	Hrs/week	Hrs/Sem	0	4
			5	75	5	75		

COURSE OBJECTIVES:

The students will be able to

- Gain knowledge about the fundamental principles, concepts in the areas of Differential and Integral Calculus.
- Apply the acquired knowledge and improve the analytical skills.

COURSE OUTCOMES:

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level(K1-K4)
CO1	Calculate the maxima and minima of differential equations	K1
CO2	Develop the knowledge about radius of curvature in Cartesian and Polar coordinates	K2
CO3	Understand the concept of Involutives, Evolutives and Asymptotes	K2
CO4	Improve the knowledge of Beta and Gamma functions	K3
CO5	Evaluate the area, volume and surface area using double and triple integrals	K4

Knowledge Level: K1-Remember, K2-Understand, K3-Apply, K4-Analyze

MAPPING WITH PROGRAMME OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	S	S	S
CO2	M	M	S	S	S	S
CO3	S	M	M	S	S	S
CO4	S	S	S	S	S	S
CO5	S	S	M	S	M	S

S- Strong; M-Medium; L-Low

UNIT-I: DIFFERENTIAL CALCULUS**15 Hours**

n^{th} Derivative- Leibnitz's theorem (without Proof) and its application- Total Differential - Maxima and Minima functions of two and three independent variables, Lagrange's method (Without proof), problems on this concepts.

UNIT-II: DIFFERENTIAL CALCULUS (Contd.)**15 Hours**

Curvature, Radius of Curvature in Cartesian and Polar coordinates, p-r equation, Centre of Curvature.

UNIT-III: DIFFERENTIAL CALCULUS (Contd.)**15 Hours**

Evolutes and Involutives - Asymptotes: Methods (without proof) of finding Asymptotes of rational algebraic curves with special cases.

UNIT- IV: INTEGRAL CALCULUS**15 Hours**

Reduction Formulae: $\sin^n \theta$, $\cos^n \theta$, $\tan^n \theta$, $\operatorname{cosec}^n \theta$, $\sec^n \theta$, $\cot^n \theta$ -Jacobians -Beta and Gamma functions - properties and problems.

UNIT- V: INTEGRAL CALCULUS (Contd.)**15 Hours**

Double Integrals- Triple Integrals- Application to Area, Surface Area and Volume.

DISTRIBUTION OF MARKS: THEORY 10% AND PROBLEMS 90%

TEXT BOOK

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	S.Narayanan and T.K.Manickavachagompillay	Calculus Volume I,II	S.Viswanathan printers and publishers pvt.ltd-Chennai	Volume I(2007) Volume II(2010)

REFERENCE BOOKS

S.N O	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Shanthi Narayan	Differential Calculus	Shymlal charitable trust, Newdelhi	2001
2	S.Sudha	Calculus	Emerald publishers, chennai	1998
3	P.Kandasamy, K.Thilagavathy	Mathematics for B.Sc Volume I,II,III,IV	S,Chand& company ltd ,Newdelhi-55	2004

WEB RESOURCES

1. <https://www.khanacademy.org/math/calculus-1>
2. <https://www.britannica.com/science/calculus-mathematics>

TEACHING METHODOLOGY

1. Class room teaching
2. Assignments
3. Discussions
4. Home Test
5. PPT presentation

SYLLABUS DESIGNERS

1. Dr.M. Kasthuri, Assistant professor of Mathematics.
2. Mrs.B. Babyshalini, Assistant professor of Mathematics.