STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI
COURSE PLAN June - November 2024

Department : **MATHEMATICS**
Name/s of the Faculty : **Dr. BENAZIR OBILIA. X. A**
Course Title : **DIFFERENTIAL CALCULUS**
Course Code : **23MT/MC/DC14**
Shift : **II**

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	Define and recall the basic concepts of differential calculus	K1
CO2	Interpret various techniques in finding derivatives	K2
CO3	Identify appropriate methods to find the solution of problems on differential calculus	K3
CO4	Analyze and examine the results of calculus through illustrations with examples	K4
CO5	Evaluate higher order derivatives and determine the properties of well-known curves	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Jun 24 – 26, 2024 (Day Order 4 - 6)	1	**Successive Differentiation** 1.1 The nth derivatives of some special functions	K1-K5	3 hours	CO1-5	Lecture & Problem Solving	Questioning
Jun 27 – July 4, 2024 (Day Order 1 - 6)	1	**Successive Differentiation** 1.2 The nth derivatives of rational algebraic functions	K1-K5	5 hours	CO1-5	Lecture & Problem Solving	Questioning & Slip Test
July 5 – 12, 2024 (Day Order 1 - 6)	1 2	**Successive Differentiation** 1.3 Leibnitz's Theorem for the nth derivative of the product of two function **Curvature** 2.1 Formulae for radius of curvature	K1-K5	5 hours	CO1-5	Lecture & Problem Solving	III Component Test -1 Assignment **(Unit 1 : Problems 10 marks)**
July 15 – 23, 2024 (Day Order 1 - 6)	2	**Curvature** 2.2 A theorem on curvature 2.3 Curvature at the origin 2.4 Chord of curvature through the origin (pole)	K1-K5	5 hours	CO1-5	Lecture, Power point Presentation & Problem Solving	Questioning & Slip Test
July 24 – 31, 2024	2	**Curvature**	K1-K5	5 hours	CO1-5	Lecture, Power point Presentation &	Questioning & Slip Test

(Day Order 1 - 6)		2.5 Centre of curvature 2.6 Property of the centre of curvature 2.7 Evolute and Involute				Problem Solving	
Aug 1 – 5, 2024 (Day Order 1 - 3)	2	**Curvature** 2.8 Properties of the evolute	K1-K5	2 hours	CO1-5	Lecture, Power point Presentation & Problem Solving	Questioning
Aug 6 – 10, 2024		**C.A. Test - I** **(unit 1 & unit 2 till sec 2.6)**					
Aug 12 – 14, 2024 (Day Order 4-6)		**Envelopes** 3.1 Definition of envelope 3.2 Envelope of straight lines	K1-K5	3 hours	CO1-5	Lecture & Problem Solving	Questioning & Slip Test
Aug 16 – 23, 2024 (Day Order 1-6)		**Envelopes** 3.3 Envelope of the curves 3.4 Envelope of a special family	K1-K5	5 hours	CO1-5	Lecture & Problem Solving	III Component Test - 2 **(Unit 2: sec 2.7 - 2.8 20 marks)**
Aug 27 – Sep 3, 2024 (Day Order 1-6)		**Envelopes** 3.5 Envelope of two-parameter family	K1-K5	5 hours	CO1-5	Lecture & Problem Solving	Questioning
Sep 4 – 11, 2024 (Day Order 1-6)		**Extrema of functions of two variables** 4.1 Extrema with two variables 4.2 Necessary conditions for maximum and	K1-K5	5 hours	CO1-5	Lecture & Problem Solving	Questioning

		minimum of extrema with two variables 4.3 Determination of maxima and minima of extrema with two variables					
Sep 12 - 20, 2024 (Day Order 1-6)		**Extrema of functions of two variables** 4.3 Determination of maxima and minima of extrema with two variables 4.4 Lagrange's method of undetermined multipliers	K1-K5	5 hours	CO1-5	Lecture & Problem Solving	Questioning
Sep 23 - 26, 2024 (Day Order 1-4)		**Extrema of functions of two variables** 4.4 Lagrange's method of undetermined multipliers **Characteristics of some special curves** 5.1 Cycloid 5.2 Catenary	K1-K5	3 hours	CO1-5	Lecture & Problem Solving	Questioning
Sep 27 – Oct 3, 2024	**C. A. Test - II** **(unit 3 & 4)**						
Oct 4 – 5, 2024 (Day 5 & 6)		**Characteristics of some special curves** 5.3 Evolutes of parabola and ellipse 5.4 Logarithmic (or Equiangular) spiral 5.5 Spiral of Archimedes	K1-K5	2 hours	CO1-5	Lecture & Power point Presentation	Questioning

Oct 7 - 15, 2024 (Day Order 1 to 6)		**Characteristics of some special curves** 5.6 Witch of Agnesi 5.7 Cardioid 5.8 Limacon 5.9 Lemniscate **Singular Points** 5.10 Double Points	K1-K5	5 hours	CO1-5	Lecture, & Power point Presentation	III Component Test - 3 MCQ Test **(Unit 5: sec 5.1-5.9 20 marks)**
Oct 16 - 22, 2024 (Day Order 1 to 6)		**Singular Points** 5.10 Double Points 5.11 Classification of Double Points 5.12 Conditions for existence of double points on an algebraic curve	K1-K5	5 hours	CO1-5	Lecture & Problem Solving	Questioning
Oct 23 - 24, 2024 (Day Order 1 to 2)	**REVISION**						