

Course Code	US01MAMTH01	Title of the Course	Calculus
Total Credits of the Course	4	Hours per Week	4 hours

Course	1.To teach Calculus in more depth.
Objectives:	2. To make practice of drawing curves in plane.
	3. To teach Calculus of Functions in two and three variables.

Course Content				
Unit	Description	n	Weightage* (%)	
1.	Successive standard F Definition, length, Ra equations. examples.	Derivative, Higher order Derivatives, n^{th} Derivatives of form, Leibnitz's Theorem and its Applications, Curvature: Length of Arc as a function. Derivative of Arc Length, Arc adius of Curvature in Cartesian, Parametric and Polar Intrinsic equation of a curve: Derivation of formula and	25%	
2.	Functions of Derivatives Three Vari Composite	of Two variables, Neighbourhood of a Point, Partial s, Euler's Theorem on Homogeneous Functions of Two and ables, Theorem on Total Differentials, Differentiation of and Implicit Functions.	25%	
3.	Sketching o intercepts, parametric axes; horiz parametric	of curves in Cartesian coordinates system using symmetry, horizontal and vertical asymptotes. Sketching of curves in coordinates system using intercepts, tangents parallel to ontal, vertical and oblique asymptotes. Cycloids and its equations.	25%	
4 Polar coordinates in two dimensions, Relation between Cartesian and Polar coordinates, Sketching of curves in polar coordinate system using symmetry, extent and closeness of a curve. Limacons, Lemniscates, Rose curves and spirals.		25%		
Teach	Teaching Classroom teaching Presentation by students Use of ICT whonover			

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





Eval	Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage	
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%	
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%	
3.	University Examination	70%	

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

Sugges	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)		
3.	H. M. Vasavda, Analytic Geometry of Two and Three Dimensions, 1992 Chapter: 2(Only 11, 12, 13), 3, 4(1 to 5)		

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

On-line Resources





Course Code	US01MAMTH02	Title of the	PROBLEMS AND EXERCISES IN	
	(PART-1)	Course	CALCULUS (PART-1)	
Total Credits of the Course	2	Hours per Week	4 hours	
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Course	1. To teach Higher Order and Partial Derivatives in more depth.			
Objectives:	2. To teach Higher Order and Partial Derivatives of Functions in two and			
	three variables.			

Course Content			
Unit	Description	Weightage*(%)	
1.	Properties of Hyperbolic Functions, Problems of Derivatives and Integration of Hyperbolic Functions and its Inverse Functions.	12.50%	
2.	L' Hospital Rule, Indeterminate Forms and Problems of Indeterminate Forms.	12.50%	
3.	Problems of Reduction Formulae for Integration of $sin^n x$, $cos^n x$, $sin^p x cos^q x$, $tan^n x$, $cot^n x$, $cosec^n x$.	12.50%	
4.	Problems of Length of an Arc, Radius of Curvature, Intrinsic equations.	12.50%	
5.	Intrinsic Equation of a curve in Cartesian and Polar Equations	12.50%	
6.	Rectification of curves in Cartesian and Parametric Equations	12.50%	
7.	Rectification of curves in Polar Equation	12.50%	
8.	Problems of Homogeneous Functions, Euler's Result, Differentiation of Composite and Implicit Functions.	12.50%	

Teaching- Learning	Classroom teaching, Presentation by students, Group discussion, Use of ICT whenever required.
Methodology	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage





1. University Examination

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

Sugges	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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Cours	se Code	US01MAMTH02	Title of the	PROBLEMS AND E	XERCISES IN
		(PART-2)	Course	CALCULUS ()	PART-2)
Total of the	Credits Course	2	Hours per Week	4 hours	5
Course Objectives:		1.To teach Geome 2.To make practice	try in more dept e of drawing cur	h. ves in plane.	
Cours	Course Content				
Unit	Unit Description Weightage*(Weightage*(%)		
1.	Curve tracing in Cartesian Equation – 1 12.50%		12.50%		
2.	Curve tracing in Cartesian Equation – 2 12.50%				
3.	3.Curve tracing in Parametric Equations12.50%			12.50%	
4.	Parametric equations of Cycloids12.50%		12.50%		
5	5 Curve tracing in Polar Coordinates 12 500/		12 50%		

5.	Curve tracing in Polar Coordinates	12.50%
6.	Tracing of Limacons	12.50%
7.	Tracing of Rose curves	12.50%
8.	Tracing of Lemniscates and Spirals	12.50%

Teaching-	Classroom teaching, Presentation by students, Group discussion, Use of
Learning	ICT whenever required.
Methodology	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	University Examination	100%





Course Outcomes: Having completed this course, the learner will be able to		
1.	Students will realize the importance of curve sketching.	
2.	Students will be able to draw various curves using its properties.	

Suggested References:		
Sr. No.	References	
1.	H. M. Vasavda, Analytic Geometry of Two and Three Dimensions, 1992 Chapter: 2(Only 11, 12, 13), 3, 4(1 to 5)	

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

On-line Resources





Course Code	US01MIMTH01	Title of the Course	Analytic Geometry
Total Credits of the Course	2	Hours per Week	2 hours

Course Objectives:	 To teach Geometry in more depth. To make practice of drawing curves in plane.

Cours	Course Content		
Unit	Description	Weightage* (%)	
1.	Sketching of curves in Cartesian coordinates system using symmetry, intercepts, horizontal and vertical asymptotes. Sketching of curves in parametric coordinates system using intercepts, tangents parallel to axes; horizontal, vertical and oblique asymptotes. Cycloids and its parametric equations.	50%	
2.	Polar coordinates in two dimensions, Relation between Cartesian and Polar coordinates, Sketching of curves in polar coordinate system using symmetry, extent and closeness of a curve. Limacons, Lemniscates, Rose curves and Spirals.	50%	

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

Evaluation Pattern			
Sr. No.	Details of the Evaluation	Weightage	
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%	
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%	
3.	University Examination	70%	





Course Outcomes: Having completed this course, the learner will be able to		
1.	Students will realize the importance of curve sketching.	
2.	Students will be able to draw various curves using its properties.	

Suggested References:		
Sr. No.	References	
1.	H. M. Vasavda, Analytic Geometry of Two and Three Dimensions, 1992 Chapter: 2(Only 11, 12, 13), 3, 4(1 to 5)	

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

On-line Resources





Cours	se Code	US01MIMTH02	Title of the Course	PROBLEMS AND EXERCISES IN ANALYTIC GEOMETRY	
Total Credits of the Course2Hours per Week4 ho		4 hours	3		
Cours Objec	Course Objectives:1.To teach Geometry in more depth. 2.To make practice of drawing curves in plane.				
Course Content					
Unit Description We			Weightage*(%)		
1.	Curve tracing in Cartesian Equation – 1		12.50%		
2.	Curve tracing in Cartesian Equation – 2		12.50%		

3.	Curve tracing in Parametric Equations	12.50%
4.	Parametric equations of Cycloids	12.50%
5.	Curve tracing in Polar Coordinates	12.50%
6.	Tracing of Limacons	12.50%
7.	Tracing of Rose curves	12.50%
8.	Tracing of Lemniscates and Spirals	12.50%

Teaching-	Classroom teaching, Presentation by students, Group discussion, Use of
Learning	ICT whenever required.
Methodology	

Evaluation Pattern			
Sr. No.	Details of the Evaluation	Weightage	
1.	University Examination	100%	





Course Outcomes: Having completed this course, the learner will be able to		
1.	Students will realize the importance of curve sketching.	
2.	Students will be able to draw various curves using its properties.	

Suggested References:		
Sr. No.	References	
1.	H. M. Vasavda, Analytic Geometry of Two and Three Dimensions, 1992 Chapter: 2(Only 11, 12, 13), 3, 4(1 to 5)	

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

On-line Resources





Course Code	US01IDMTH01	Title of the Course	Higher Order and Partial Derivatives
Total Credits of the Course	2	Hours per Week	2 hours

Course Objectives:	 To teach Higher Order and Partial Derivatives in more depth. To teach Higher Order and Partial Derivatives of Functions in two and
5	three variables.

Course Content			
Unit	Description	Weightage* (%)	
1.	Successive Derivative, Higher order Derivatives, n^{th} Derivatives of standard Form, Leibnitz's Theorem and its Applications, Curvature: Definition, Length of Arc as a function. Derivative of Arc Length, Arc length, Radius of Curvature in Cartesian, Parametric and Polar equations. Intrinsic equation of a curve: Derivation of formula and examples.	50%	
2.	Functions of Two variables, Neighbourhood of a Point, Partial Derivatives, Euler's Theorem on Homogeneous Functions of Two and Three Variables, Theorem on Total Differentials, Differentiation of Composite and Implicit Functions.	50%	

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

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%





Course Outcomes: Having completed this course, the learner will be able to		
1.	Students will realize the power of Leibnitz's Theorem.	
2.	Students will be able to find areas and surface areas using basic Calculus.	
3.	Students will be able to take us course 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)	

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On-line Resources





Cours	se Code		Title of the	of the PROBLEMS AND EXERCISES IN	
		US01IDMTH02	Course	HIGHER ORDER A	ND PARTIAL
				DERIVAT	IVES
Tatal	Cradita		II	DERGVIII	
Total	Creans	2	Hours per	4 hours	5
of the	Course		Week		-
Cours	e e	1 To teach Higher	r Order and Parti	ial Derivatives in more de	enth
Object	tivos	2. To teach Higher Order and Partial Derivatives of Franctions in teac and			
Objec	tives.		el Oldel alla Pa	Itial Delivatives of Fund	tions in two and
		three variables.			
C					
Course Content					
Unit	nit Description Weig		Weightage*(%)		
			/		
1.	Propertie	es of Hyperbolic Fu	nctions, Problem	ns of Derivatives and	12.50%
	Integration of Hyperbolic Functions and its Inverse Functions				
	integration of tryperoone r unctions and its inverse r unctions.				
	<u> </u>				
2.	L'Hospital Rule. Indeterminate Forms and Problems of 12 50%			12.50%	
	Indeterminate Forms				

2.	L' Hospital Rule, Indeterminate Forms and Problems of Indeterminate Forms.	12.50%
3.	Problems of Reduction Formulae for Integration of $sin^n x$, $cos^n x$, $sin^p x cos^q x$, $tan^n x$, $cot^n x$, $cosec^n x$.	12.50%
4.	Problems of Length of an Arc, Radius of Curvature, Intrinsic equations.	12.50%
5.	Intrinsic Equation of a curve in Cartesian and Polar Equations	12.50%
6.	Rectification of curves in Cartesian and Parametric Equations	12.50%
7.	Rectification of curves in Polar Equation	12.50%
8.	Problems of Homogeneous Functions, Euler's Result, Differentiation of Composite and Implicit Functions.	12.50%

Teaching-	Classroom teaching, Presentation by students, Group discussion, Use of
Learning	ICT whenever required.
Methodology	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage





1. University Examination

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

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