SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER -I
FSMA-101
(ANALYTIC GEOMETRY AND COMPLEX NUMBERS)
TWO HOURS PER WEEK (2 CREDIT)
Effective from June 2010.
Marks:-100 (30 internl+70 external)

Unit 1

Sketching of curves using symmetry and horizontal and vertical asymptotes.; Equation of tangents and normal to curves given by parametric equations. Parametric equations of conics and other curves; Tangent parallel to the axes, Asymptotes: horizontal, vertical and oblique to a curve; cycloid and its application.

Unit 2

Polar coordinates in two dimensions; Relation between polar and Cartesian coordinates; Symmetry, extent and closedness of a curve, Limacons, Lemniscates, Rose curves and Spirals.

Unit 3

Polar equations of line, Circle and Conics, Reciprocal curves and their applications.

Unit 4

Complex numbers, Polar form of complex number. De Movire theorem, n^{th} roots of a complex number, Fundamental theorem of algebra (statement only), multiple roots and test for multiplicity.

Recommended Texts :

1. Vasavada H.M., Analytical geometry of two and three dimensions , 1992 Chapter 2(11,12,13), Chapter 3(2,3,4, except example 10,11,12,13), Chapter 4 (1,2,3,6,7(except example 8,9),8), Chapter 5(2,6,7,8)

2. Grewal, B.S., Higher engineering mathematics, Thirty fifth edition, Khanna publ. 2000.

3. The calculus with analytic geometry, Louis Leithod, Harper-Collins Pub.

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER -I
FSMA-102
(CALCULUS AND DIFFERENTIAL EQUATIONS)
TWO HOURS PER WEEK (2 CREDIT)
Effective from June 2010.
Marks:-100 (30 internl+70 external)

Unit 1

Successive derivative, Higher order derivatives: n^{th} derivatives of standard form. Leibnitz's theorem and its applications; Angles between radius vector and tangent to the curve.

Unit 2

Curvature, derivative of arc, radius of curvature for Cartesian, Parametric and polar equations. Rectification: Expression for the length of arcs given in Cartesian, parametric and polar forms; derivation of intrinsic equation for Cartesian and polar equations.

Unit 3

Limit and continuity of a 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 implict functions.

Unit 4

Exact differential equations; integrating factors; differential equations of the first order but not of first degree solvable for p and for y; Clairaut's equation; Orthogonal trajectories in Cartesian coordinates.

Recommended Texts:

1. Introduction to calculus and differential equations, By D J Karia, N Y Patel, B P Patel, M L Patel [Standard Text]
   Articles: 8,9,10,17,18,19,49,50,51,20 to 25,26.2,54(case 6 only), 55 (method 1 only), 56,57,58,60, 62(only 62.1,62.2,62.4 to 62.7)

2. Differential Calculas. Shanti Narayan, Fourteenth Edition, Shamlal charitable trust, New Delhi, 1996

3. Integral Calculas. Shanti Narayan, Fourteenth Edition, Shamlal charitable trust, New Delhi, 1996

4. Higher Engineering Mathematics, Thirty-fifth edition. Grewal, B.S. [Khanna Publ]

5. The calculus with analytic geometry, Louis Leithod, Harper-Collins Pub.

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
SYLLABUS FOR B.Sc.(MATHEMATICS)
SEMESTER -I
FSMA-103
(PROBLEMS AND EXERCISES IN MATHEMATICS)
FOUR HOURS PER WEEK (2 CREDIT)
Effective from June 2010.
Marks:-100(30 internl+70 external)

- L'Hospital's rule and exercises
- Sketching of Cartesian curve, parametric curves, polar curves and reciprocal curves
- Angles between two curves
- Radius of curvature for Cartesian, Parametric and polar equations
- Arc length of the curves given in Cartesian, parametric and polar forms
- Intrinsic equation for Cartesian and polar equations
- Euler's theorem on homogeneous functions, Change of variables
- Maxima and minima for a function of two variables
- Taylor's expansion
- Exact Differential equations
- Differential equations of the first order but not of first degree solvable for p, for x and for y
- Orthogonal trajectories of a family of curves
- Algebra of complex numbers

NOTE:

- Problem solving skill in mathematics is an important aspect in the teaching of mathematics.
- There would be a batch of problem solving session will be of four hours per week and they will be conducted in batches of students of size 25 per batch.

Recommended Texts:

1. Introduction to calculus and differential equations, By D J Karia, N Y Patel, B P Patel, M L Patel [Standard Text]

2. Vasavada H.M., Analytical geometry of two and three dimensions, 1992

3. Differential Calculas. Shanti Narayan, Fourteenth Edition, Shamlal charitable trust, New Delhi, 1996

4. Integral Calculas. Shanti Narayan, Fourteenth Edition, Shamlal charitable trust, New Delhi, 1996

5. Higher Engineering Mathematics, Thirty-fifth edition. Grewal, B.S. [Khanna Publ]

6. The calculus with analytic geometry, Louis Leithod, Harper- Collins Pub.

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Vallabh Vidyanagar
SYLLABUS FOR B.Sc.
SEMESTER -I
FSELE-101
(MATHEMATICS)
TWO HOURS PER WEEK (2 CREDIT)
Effective from June 2010.
Marks:-100(30 internl+70 external)

Unit-1

Function: Domain, Range, One-one, onto function, composition of functions, Complex number: Algebra of complex number.
Quadratic equation and its solution.

Unit-2

Exponential & Logarithmic function: Elementary properties.
Trigonometric functions: sine, cosine, tan, cot, cosec, sec and their inverse function. Formulae: cos(A±B), sin(A±B), tan(A±B), sin(2θ), cos(2θ), tan(2θ).

Unit-3

Determinant: 2×2, 3×3 order, Expansion, elementary properties, Matrices: 2×2, 3×3 order, Algebra of matrices
(Addition, Scalar product, product of two matrices)

Unit-4

Vector algebra: Vector space R^2 and R^3, Operation: Addition, scalar multiplication and vector multiplication , magnitude of vector , Inner product, Box/Triple product, angle between two vectors.

Recommended Texts:

1. College Algebra, 2nd Edition, By Spiegel M.R., Moyer R.E., Tata Macgrow-hill Publishing Co. Ltd.
2. Analytic Calculus, Fuller and Parker.
3. Differential Calculus, By Shanti Narayana, S.Chand Publishing co.,
4. Vasavada H.M., Analytical geometry of two and three dimensions , 1992