

**SWAMI RAMANAND TEERTH MARATHWADA
UNIVERSITY, NANDED.**

B.A./B. Sc. F.Y. MATHEMATICS SYLLABUS:

**SEMESTER SYSTEM
WITH EFFECT FROM JUNE 2009**

SEMESTER: I

Paper I: (MT101): Differential Calculus: (Maximum periods: 60)

Unit I: The Real Numbers: The real numbers system,
Mathematical Induction, the Real line.

Unit II: Differential Calculus of functions of one Variable:
Functions and Limits, Continuity.

Unit III: Differentiable Function of one Variable, L'Hospital's
Rule, Taylor's theorem.

Text Book Introduction To Real Analysis.
-William F. Trench, Pearson Education Pub.(March 2009)

Scope **Chapter 1 :** Complete (Theorem 1.3.7 without Proof., Delete Ex. 1.3.11)
Chapter 2 : Art. 2.1: Delete Ex 2.1.13, Theorem 2.1.11 without proof.
Art. 2.2: Theorem 2.2.14 and 2.2.15 without proof.
Art. 2.3: Delete Consequences of Mean value theorem.
Art 2.4: Delete Indeterminate forms.
Art. 2.5: Delete Theorems 2.5.3 to 2.5.5, Delete Examples
2.5.4 and 2.5.7.

Reference Books:

- 1) Introduction to Real Analysis By R.G. Bartle.(John Wiley and Sons)
- 2) Differential calculus By Shanti Narayan.(S. Chand and Co.)
- 3) Elements of Real Analysis By Shanti Narayan and M.D. Raisinghania.
(S. Chand and Co).

B.A./B. Sc. F.Y.

SEMESTER I

Paper II: (MT102): Algebra and Complex Numbers

(Maximum Periods:60)

- Unit I** Prerequisites, Standard form of a complex number, Geometrical representation, Product and quotient of Complex numbers, Geometrical representation of Sum and difference, Results concerning conjugate, Modulus and Amplitude.
De Moivre's theorem: Statement, Roots of Complex number, Some standard results, Solutions of equations.
Polynomial: Definition, Zero polynomial, Degree, Equality, Complete and incomplete polynomial, zero of Polynomial, Division Algorithm, Fundamental theorem of algebra.
- Unit II** Prerequisites, Multiplication of two Matrix, Properties of multiplication, Positive integral powers of a matrix, Transpose of matrix, Conjugate of a matrix, Determinant of a square matrix, minor of an elements, co-factor, Ad joint of a square matrix, Inverse of a square matrix, Singular and non-singular matrix.
- UnitIII** Rank of a matrix and Linear equations: Minor of Order K of a matrix, Rank of a matrix, Elementary Row, Column operations, Elementary operations, inverse of an elementary operations.
Equivalent Matrices: Row, Column equivalent matrix, Row-Echelon matrix, Row rank and column rank of a matrix.
Linear Equation: Equivalent system, system of homogeneous equations.

Textbook Topics in Algebra By O.M.P.Chug, K. Prakash, A.D. Gupta.
Anmol Pub. Pvt.Ltd. New Delhi.

Scope Chapters1: 1.1 to 1.3, 1.5,1.6 (Prerequisites)
Art: 1.7, 1.8 (a) (Delete theory 1.8b), 1.9, 1.10 (a), (b), 1.12, 1.13, 1.14.
Chapter 2: Art 2.1 to 2.6 [Delete Exercise 2(a)] 2.3 (only statement).
Chapter 3: Art 3.1 to 3.8, 3.8(only statement), 3.15(only statement).
Chapter10: 10.9 to 10.14(10.13 only statement),10.20,10.21,10.22,
10.27 to 10.32.
Chapter11: Art 11.1, 11.2, 11.5 to 11.16, 11.32 to 11.39.

Reference Book:-

1. Elementary Topics in Algebra, By K. Khurana and S.B. Malik.
(Vikas Publishing House Pvt. Ltd., New Delhi.)

2. A Text Book of Matrices By Shanti Narayan
(S.Chand and Company Ltd., Ram Nagar, Delhi-11055)
3. Complex Variables and Applications By. Ruel V Churchill, James Ward Brown, (McGraw-Hill International Book Company).
4. Theory of Functions of a Complex Variable By Shanti Narayan and P.K. Mittal. (S. Chand and Company LTD, New Delhi).