

**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**  
**M.Sc. (I.T.) [Five Years Integrated Course]**  
**B.Sc. (Information Technology)**  
**1<sup>st</sup> Semester Syllabus**

Effective From July-2003

**Paper No : 101**  
**Paper Title : Maths – I.**  
**Prerequisite : Set Theory.**

**[L : 4, P : 0 Hrs]**

**1. Relations:**

Cartesian Product of sets; relations as sets of ordered pairs; types of relations; Properties of relations; Congruence relations; Equivalent classes; Composition of relations; Algebra of relations.

**2. Functions:**

Functions as sets of ordered pairs; Types of functions; Equality of functions; Algebra of functions; Composition of two functions; Inverse functions; Characteristics functions; Functions in Business economics; Equilibrium prices.  
Binary operations; Properties of Binary operations.

**3. Theory of Matrices:**

Matrices; Types of matrices; Equality of matrices; Operations on matrices; Properties of Operations Singular Matrices; Inverse of Matrix; Adjoint of Matrix; Rank of Matrices; Elementary Row/Column transformations; Row/Column equivalent canonical forms; Inverse using elementary transformations; Solution of a system of linear equations using elementary transformations.

**4. Basic Statistics:**

Introductions: Definitions Merits and demerits: Frequency distributions and frequency charts;  
Measures of Central tendency: Arithmetic mean; geometric mean; Harmonic mean; Median; Mode; Quartiles, Deciles and Percentiles.  
Measures of Dispersion: Range, Quartile deviation; Mean deviation; Standard deviation; Skewness and Kurtosis.

**5. Probability Theory:**

Introduction: Definition; Sample spaces: Events: Types of events; algebra of events; Conditional Probability; theorems on probability; Baye's theorem.

**6. Random variables and distributions:**

Random variables (discrete and continuous); Mathematical expectations and Variance. Discrete Probability Distributions: Binomial Distribution; Density function; Mean and variance of the Distribution Properties and uses.  
Poisson Distribution: Density function; Mean and Variance of the distribution, properties and uses.

**Main Readings :**

1. C. L. Liu: Elements of Discrete Mathematics, 2<sup>nd</sup> Edition: McGraw Hill 1985.
2. B.S. Vatssa: Discrete Mathematics; Wishwa Prakashan.
3. K.B. Datta: Matrix and Linear algebra; Prentice Hall of India; 1991.
4. B.L. Agrawal: Basic Statistics (1996). New – age International Publishers, New Delhi.
5. A.M. Goon; M.K. Gupta & B. Dasgupta; Fundamentals of Statistics (Vol. 1) (1986)
6. Kapur and Gupta: Fundamentals of Mathematical Statistic; S. Chand and Co.