Gujarat University

K. S. School of Business Management and Information Technology
[Five Years' (Full – Time) M.Sc. (CA&IT) Integrated Degree Course]
First Year M.Sc. (CA&IT) (Semester - I)

Course Name: Mathematical Concepts.

Course code: DSC-M-IMSCIT-113T

Course Credit: 2

Course Outcomes:

The aim of this course is to enable students to

- Develop a good insight of basic two and three dimensional geometry.
- Be able to evaluate area of triangle whose vertices are given.
- Learn about dot product of vectors and cross product of vectors.
- Be able to determine whether the given lines are intersecting or not.
- Be able to work with matrices, find inverse and perform some operations on matrix.
- Be able to solve system of linear equations using matrix theory.
- Learn to find rank of any matrix.

Contents:

Unit No.	Course Content	Hours	Credits
1	**Geometry** **Introduction to two dimensional co-ordinate geometry:** Distance formula, section formula, area of triangle, concurrent points: centroid, incenter and circumcenter of a triangle. **Straight lines in two dimensional space:** Line and its equation (point slope form, two-point form, double intercept form, angle of inclination form), angle between two lines, condition for the set of lines to be parallel, perpendicular, overlapping or intersecting. **Straight lines in three dimensional space:** Geometric understanding of 3D space and coordinate point representation, distance formula, dot product, cross product, equation of line in space, direction ratio and direction cosines of a line, condition for the set of lines in space to be parallel, perpendicular, overlapping or intersecting.	**15**	**1**

2	**Theory of matrices** **Introduction to matrices:** Matrix and its types, operations on matrices, adjoint of a matrix **Elementary row operations on a matrix and RRE form of a matrix:** elementary row operations, row reduced echelon form of a matrix, rank of matrix, matrix inversion by adjoint method, matrix inversion by row operations, determinant, properties of determinant **Solution of system of linear equations using RRE form:** solution of simultaneous system of linear equations by adjoint method, Gauss Jordon method, Gauss elimination method.	**15**	**1**

Reference Books:

1. Syllabus is roughly entirely covered from 11th Science Gujarat Board textbook and 12th Science Gujarat Board textbook
2. Coordinate geometry, S.K. Goyal, Arihant publications.
3. Analytic geometry of two and three dimensions by Hema Vasavada.
4. Engineering mathematics, B.S. Grewal, Khanna publishers, New Delhi
5. Advanced engineering mathematics, H.K. Dass, S. Chand.

Accomplishments of the student after completing the Course:

After completion of this course Student would be able to

- Calculate distance between points given in 2-D and 3-D space.
- Visualize line in 2-D and 3-D space.
- Perform various operations like addition, subtraction, multiplication on matrices.
- Solve system of linear equations.