

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: Analytic Geometry and Trigonometry

Course Code: DSC-M- IMSCIT-113T

Course Credit: 2

Course Outcomes:

By completing this course a student will:

- Develop a good insight of basic 2 and 3 dimensional geometry.
- Learn about dot product of vectors and cross product of vectors.
- Be able to determine whether the given lines are intersecting or not.
- Know about trigonometric functions and their inter-relationships.
- Learn some useful identities involving trigonometric functions.

Contents:

Unit No.	Course Content	Hours	Credits
1	<p>Geometry</p> <ul style="list-style-type: none"> • Distance formula, section formula, area of triangle, concurrent points: centroid, incenter and circumcenter of a triangle. • 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. • 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	<p>Trigonometry</p> <ul style="list-style-type: none"> • Definition of trigonometric functions, its domain range and graph, identities, formulae for $\sin(A + B)$, $\sin(A - B)$ etc., formulae for $\sin A \cos B$, $\sin A \sin B$ and $\cos A \cos B$, formulae for $\sin 2A$, $\sin 3A$ etc., problems on heights and distances. • Introduction to inverse trigonometric functions, its domain range and graph, some identities involving inverse trigonometric functions (all formulae in this module are without proof). 	15	1

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Reference Books:

1. 11th Science Gujarat Board textbook and 12th Science Gujarat Board textbook
2. Coordinate geometry,
By S.K. Goyal, Arihant publications.
3. Analytic geometry of two and three dimensions,
By Hema Vasavada.
4. Plane trigonometry part-1 and part-2,
By SL Loney, Arihant Prakashan.
5. How to memorize formula in Mathematics: Book 2 Trigonometry,
By Rajesh Sarswat, kindle ebook.
6. Trigonometry,
By Ted Sundstrom and Steven Schlicker, Grand valley state university.
7. Algebra and trigonometry: Functions and applications,
By Paul A. Foerster, Prentice Hall.

Accomplishments of the student after completing the Course:

Upon successful completion of the "Analytic Geometry and Trigonometry" course, students will be able to:

- Calculate and interpret distances, sections, and areas using appropriate formulas, such as the distance formula and section formula.
- Formulate equations of lines using different methods and analyze the relationship between two lines, determining whether they are parallel, perpendicular, overlapping, or intersecting.
- Understand and apply the concepts of dot product and cross product for vectors, especially in the context of geometric representation in 3D space.
- Formulate and interpret the equation of a line in three-dimensional space, including understanding direction ratios and direction cosines of such lines.
- Gain knowledge about the foundational trigonometric functions, their domains, ranges, and graphical representations.
- Apply trigonometry in practical problems, especially those related to heights and distances, showcasing real-world applicability of trigonometric principles.