



| Course No. | Course Title | No. of Units | | | Pre-requisites |
|------------|--|--------------|-----|--------|----------------|
| | | Th. | Pr. | Credit | |
| MATH 462 | Euclidean and non-Euclidean Geometries | 3 | - | 3 | MATH 342 |

Course Objectives:

At the end of the course, students should have a strong working knowledge of the following topics:

- To introduce to the students the basic concepts of Euclidean and non-Euclidean geometries.
- To improve the students logical thinking.
- Using elliptic property, the student will learn geometry without parallel lines.
- Using hyperbolic parallel property, the student will learn geometry with several parallel lines through a point.
- They will learn the use of ordered fields in various geometries.
- They will learn the extension of affine plane as a projective plane.

Course Description:

Fundamentals of Euclidean and non-Euclidean geometries, Axioms of Incidence, Betweenness, Congruence, Hilbert-Euclidean, Dedekind, Elliptic Euclid's and hyperbolic parallel properties, Affine and projective geometries, Ordered field, Defect of a triangle, Saccheri's quadrilateral, Lobachevskian geometry, Independence of Parallel Postulate Beltrami-Klein Model.

Main Text Book:

- Euclidean and non-Euclidean Geometries, Development and History, by Marvin Jay Greenberg, W. H. Freeman and Company, New York 2007.

Subsidiary Books:

- Experiencing Geometry: Euclidean and Non-Euclidean with History, by D. W. Henderson and D. Taimina, Pearson; 3rd edition, 2004.