Department of Mathematics **Faculty of Science**

MATH 312 (206312) **INTRODUCTION TO FOUNDATION OF GEOMETRY** **3(3/3-0/0)**

Abbreviation **INTRO TO FOUND OF GEOMETRY**

Prerequisite MATH 207 (206207) or MATH 216 (206216) or MATH 217 (206217)

Course Description

Foundations of geometry. Analytic projective geometry. Affine geometry. Euclidean and Non-Euclidean geometry. Introduction to topology.

Course Contents	**No. of Lecture Hours**
1. Foundation of geometry. Axiomatic system. Euclid's geometry. Hilbert's axioms. Neutral geometry. Synthetic projective geometry.	9
2. Analytic projective geometry Representation in space. Representation in plane and line. Matrices. Classification of projective transformations. Conics	9
3. Affine geometry Ideal points. Parallels, midpoint. classification of conics. Affine transformations. translations. Dilations. Line reflections. Survey.	9
4. Euclidean and Non-Euclidean geometry Early Greek influence. Descriptive geometry. Euclid's fifth postulate. Saccheri and Lanbert. Hyperbolic geometry. Elliptic and spherical geometry.	9
5. Topology Metric space. Topology. Homeomorphic figues. Jordan curve theorem Four-color problem. Survey.	9
Total	**45**