INSTITUTE OF MATHEMATICS
College of Science
University of the Philippines Diliman

Math 140 Course Syllabus

A. Course Catalogue Description

Course Number	Math 140
Course Title	Introduction to Modern Geometries
Course Description	Development of modern geometries; finite geometries; geometric transformations; projective geometry; non-Euclidean geometries
Prerequisite	Math 108/equiv. or COI
Course Credit	3 units
Number of Hours	3 hours/week

B. Course Content

I. Course Introduction and Orientation

II. A Historical Introduction

1. Geometry before Euclid (Babylonians, Egyptian, Greek)
2. Axiomatic systems (independence, consistence, completeness)
3. Euclid's Postulates
4. Development of Modern Geometries

III. Finite Geometries

1. Examples of Finite Geometries
   a. 3-point
   b. 4-point
   c. 4-line
   d. Fano's
   e. Young's
   f. Pappus
   g. Desargue
2. Near linear and linear spaces

IV. Projective Geometry

1. Axioms
2. Duality
3. Harmonic sets
   Projective transformations, special projectivities
   Homogeneous coordinates
   Equations for projective transformations
4. Topological transformations (optional)

V. Non-Euclidean Geometries

1. Euclid's Fifth Postulate
2. Playfair's Axiom and other statements equivalent to the Fifth Postulate
3. Hyperbolic Geometry
4. Elliptic Geometry

For a more detailed syllabus, send an email request to ddapr@math.upd.edu.ph.