

INSTITUTE OF MATHEMATICS
College of Science
University of the Philippines Diliman

Math 10 Course Syllabus

A. Course Catalogue Description

Course Number	Math 10
Course Title	Mathematics, Culture and Society
Course Description	Appreciation of the beauty and power of mathematics through the examination of its nature, development and utility, and its relationship with culture and society
Prerequisite	None
Course Credit	3 units
Number of Hours	3 hours/week

B. Course Content

I. Introduction

1. Overview of the course
2. Numeracy and quantitative literacy
3. Student and public attitudes and perceptions of math
4. Preliminary reflections on the nature and practice of math

II. Nature of Math: Math as a Language, Way of Thinking, Creative Activity, and Tool

1. Logic and reasoning
2. Philosophical foundation: Platonism, formalism: is math created or discovered?
3. Abstraction, symbols
4. Axiomatic systems, rigor, proof, and truth in mathematics
5. Sets: finite and infinite
6. Numbers
 - a. Numeration systems
 - b. Real numbers, modular number systems
7. Shapes
 - a. Euclid's geometry and the discovery of non-euclidean geometries
 - b. Finite and other modern geometries
8. Functions
 - a. Change, growth, and mathematical modeling
 - b. Deterministic, probabilistic/stochastic behavior
 - c. A peek into the calculus
9. Mathematics as the science of patterns

III. Utility and Ubiquity: math in different disciplines

1. Arts and Humanities
 - a. Math in visual arts and design
 - b. Math in music and dance
 - c. Math in literature
 - d. Math in folk and popular culture
2. Social Sciences
 - a. Voting theory and the math of social choice
 - b. Game theory and analysis of conflict and competition
 - c. Group theory and kinship relations
 - d. Social networks, small world networks, and the use of graphs

3. Science, Engineering and Technology

- a. Math in nature: golden ratio, Fibonacci numbers
- b. Technology, computers and their impact on mathematics
- c. Math in medicine and the life sciences
- d. Operations research, manufacturing, transportation and mathematical programming

IV. Issues and Trends in Mathematics

(Suggested Topics)

1. Math and Gender
2. Truth and Certainty in Math
3. State of Mathematics and Mathematics Education in the Philippines
4. Ethnomathematics/ Critical Mathematics/ Humanistic Mathematics
5. Great Problems: Solved and Unsolved

V. What is Mathematics, Really? (Integration and Summary)

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