INSTITUTE OF MATHEMATICS
College of Science
University of the Philippines Diliman

Math 158 Course Syllabus

A. Course Catalogue Description

Course Number	Math 158
Course Title	Introduction to Discrete Mathematics
Course Description	Permutations and combinations; binomial and multinomial coefficients; the Principle of Inclusion and Exclusion; graphs and their properties; families of graphs, distance and connectivity in graphs; selected topics in discrete mathematics
Prerequisite	Math 108/equiv. or COI
Course Credit	3 units
Number of Hours	3 hours/week

B. Course Content

I. Course Overview and Orientation

II. Enumerative Combinatorics
1. Two basic counting principles
2. Permutations
3. Combinations
4. The Injection and Bijection Principles
5. Arrangements and selections with repetitions
6. Distribution problems
7. The Binomial Theorem and applications
8. Multinomial coefficients and the Multinomial Theorem
9. The Pigeonhole Principle
10. Principle of Inclusion and Exclusion

III. Graph Theory
1. Introduction to Graph Theory
2. Special types of graphs
3. Isomorphic graphs
4. Degree of a vertex
5. Trees
6. Paths and distance
7. Eulerian graphs
8. Planarity
9. Connectivity
10. Ramsey numbers and Ramsey-type problems

IV. Selected topics (lecturer may choose any topic in Discrete Mathematics, including but not limited to the following)
1. Additional topics in enumerative combinatorics
2. Additional topics in graph theory
3. Designs and Latin squares
4. Discrete geometry
5. Combinatorics on words
6. Coding Theory
7. Lattices

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