

INSTITUTE OF MATHEMATICS
College of Science
University of the Philippines Diliman

Math 123.1 Course Syllabus

A. Course Catalogue Description

Course Number	Math 123.1
Course Title	Advanced Calculus I
Course Description	The real number system; point set topology; sequences of real numbers; limits and continuity; the derivative; the Riemann integral; sequences of functions; uniform convergence
Prerequisite	Math 23/equiv. and Math 108/equiv., or COI
Course Credit	3 units
Number of Hours	3 hours/week

B. Course Content

- I. Course Introduction and Orientation
- II. The Real Numbers
 1. Supremum and Infimum
 2. Completeness Property of \mathbb{R}
 3. Topology of \mathbb{R}
- III. Sequences in \mathbb{R}
 1. Limit of a Sequence
 2. Monotone Sequences and Subsequences
 3. Cauchy Sequences
 4. Properly Divergent Sequences
- IV. Limits of Functions
 1. Limit of a Function and Sequential Criterion for Limits
 2. Limit Theorems
 3. One-Sided Limits, Infinite Limits, Limits at Infinity
- V. Continuous Functions
 1. Continuity of a Function at a Point
 2. Continuity of a Function on an Interval
 3. Uniform Continuity
- VI. Derivative of a Function
 1. Differentiability of a Function
 2. Differentiation Rules
 3. Mean Value Theorem and its Consequences
 4. L'Hospital's Rule
- VII. Riemann Integral
 1. Upper and Lower Sums
 2. Riemann Integrability
 3. Fundamental Theorem of Calculus
- VIII. Sequences of Functions
 1. Pointwise and Uniform Convergence
 2. Interchange of Limits

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