

INSTITUTE OF MATHEMATICS
College of Science
University of the Philippines Diliman

Math 150.2 Course Syllabus

A. Course Catalogue Description

Course Number	Math 150.2
Course Title	Mathematical Statistics II
Course Description	Limiting distributions; estimation of parameters; tests of hypothesis; regression and correlation; analysis of variance; applications
Prerequisite	Math 150.1
Course Credit	3 units
Number of Hours	3 hours/week

B. Course Content

- I. Course Introduction and Orientation
- II. Sampling Distributions
 1. Introduction to Statistical Inference
 2. Random Sample
 3. Statistics and Sampling Distributions
 4. Distributions Derived from the Normal Distribution (t , χ^2 , F)
 5. Order Statistics
 6. Limit Theorems (Law of Large Numbers, Central Limit Theorem)
- III. Point Estimation
 1. Introduction and Definitions for Parametric Point Estimation
 2. Optimal Properties of Point Estimators (Consistency, Sufficiency and Completeness, Unbiasedness, Minimum Variance, Mean Square Error, Efficiency, Invariance, Robustness)
 3. Methods of Finding Point Estimators (Method of Moments, Percentile Matching, Maximum Likelihood Estimation)
- IV. Interval Estimation
 1. Introduction and Definitions for Parametric Confidence Interval Estimation
 2. Optimal Properties of Confidence Interval Estimators
 3. Methods of Finding Confidence Interval Estimators (Pivotal Quantity Method, Statistical Method, Asymptotic Methods)
 4. Sampling from the Normal Distribution (One and Two Sample Case, Sampling from Bivariate Normal and Bernoulli Distribution)
- V. Hypothesis Testing
 1. Introduction and Definitions for Parametric Hypothesis Testing
 2. Optimal Properties of Tests of Hypothesis (Power of a Test, Unbiasedness)
 3. Methods of Constructing Tests of Hypothesis
 4. Sampling from the Normal Distribution (One and Two Sample Case, Test on Paired Observations)
 5. Relationship Between Hypothesis Testing and Confidence Interval
- VI. Applications of Statistical Inference
 1. Introduction to Statistical Data Analysis (Sampling and Experimental Designs, Levels of Measurement, Normality Assumption, Choosing the Appropriate Statistical Method, Statistical vs. Practical Significance)
 2. Tests for Means (t and z tests)
 3. Tests for Variances (F test)
 4. Tests for Proportions (Binomial test)

5. Measures of Association (Correlation and Simple Linear Regression)
6. Tests for Equality of Means on Multiple Population (Analysis of Variance)
7. Tests of Independence (Chi-square Tests and Contingency Tables)
8. Goodness-of-Fit Tests
9. Nonparametric Statistics

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