



**School of Statistics
UNIVERSITY OF THE PHILIPPINES**

**STATISTICS 115:
Basic Statistical Methods**

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Consultation Hours: M 1:00 – 5:00, TWThF 4:00 – 5:30

Course Objectives

The major objective of this course is simply to introduce the basic principles of Inferential Statistics. In order to enlighten the student on these basic principles, selected elementary tools in Inferential Statistics will be presented. And by the end of the semester, the student of this course must be able to achieve the following:

- Commit to memory the basic terms, concepts and notations used in Applied Statistics, especially those that are useful in Inferential Statistics;
- Know how to solve simple probability problems using the a priori and a posteriori approaches to assign probabilities;
- Know how to use the normal, t, χ^2 , and F tables to compute for probabilities;
- Understand the concept of sampling distributions and know the sampling distributions of common statistics computed from a random sample from a normal distribution;
- Comprehend the basic concepts used in estimating population parameters and testing statistical hypotheses;
- Compute for the point and interval estimates of usual parameters that describe a single population or are used to compare two or more populations;
- Conduct tests of hypotheses on these parameters and interpret the results of these tests;
- Perform the chi-squared test for independence;
- Estimate the regression coefficients of the simple linear regression model using the method of least squares;
- Be acquainted with simple tools used to study the relationship between two variables;
- Be aware of the basic principles of experimental design;
- Know the description and principal advantages and disadvantages of some basic experimental designs;
- Know the classical smoothing methods in times series analysis; and,
- Generate and interpret particular computer outputs of Microsoft Excel.

Course Outline

1. Preliminaries
 - 1.1 Review: Descriptive Statistics vs Inferential Statistics
 - 1.2 Random Experiment, Sample Space and Probability
 - 1.3 Random Variable and Its Distribution
 - 1.4 The Normal Distribution
2. Sampling Distributions
 - 2.1 Basic Concepts
 - 2.2 Central Limit Theorem
 - 2.3 Sampling from the Normal Distribution
3. Estimation: Single Population
 - 3.1 Basic Concepts
 - 3.2 Point Estimation of a Parameter
 - 3.3 Confidence Interval for the Mean
 - 3.4 Confidence Interval for the Proportion
 - 3.5 Confidence Interval for the Variance
4. Estimation: Two Populations
 - 4.1 Basic Concepts
 - 4.2 Point Estimation of the Difference Between Two Means and of the Difference Between Two Proportions, and Ratio of Two Variances
 - 4.3 Confidence Interval for the Difference of Means
 - 4.4 Confidence Interval for the Difference of Proportions
5. Test of Hypotheses: Single Population
 - 5.1 Basic Concepts
 - 5.2 Hypothesis Tests for the Mean
 - 5.3 Hypothesis Tests for the Proportion
 - 5.4 Hypothesis tests for the Variance
6. Tests of Hypotheses: Two Populations
 - 6.1 Hypothesis Tests for Two Means
 - 6.2 Hypothesis Tests for Two Proportions
7. Chi-Square Tests
 - 7.1 Test for Independence
 - 7.2 Test of Homogeneity

8. Simple Linear Regression Analysis
 - 8.1 Correlation Analysis
 - 8.2 Simple Linear Regression Model
 - 8.3 Estimation Using the Method of Least Squares

9. Experimental Design
 - 9.1 Basic Principles
 - 9.2 Completely Randomized Design (CRD)
 - 9.3 Randomized Complete Block Design (RCBD)
 - 9.4 Latin Squares

10. Time Series Analysis: Smoothing Techniques
 - 10.1 Components of Time Series
 - 10.2 Single Moving Average
 - 10.3 Single Exponential Smoothing

Textbook: *Elementary Statistics* by Almeda, Capistrano and Sarte

Course Requirements

- Long Exams There will be 4 long exams. The coverage of the exams are as follows:

	<u>Coverage</u>
First Exam	Chapters 1 – 2
Second Exam	Chapters 3 – 4
Third Exam	Chapters 5 – 6
Fourth Exam	Chapters 7– 10

We will schedule our exams outside class hours, around a week after we finish discussing the topics included in the exam. Please inform me of any conflicts in the schedule a week before the exam so that we may schedule a special exam. Bring calculator and the necessary tables, ballpens, and blue books.

If you missed an exam for valid reasons (e.g., illness), please see me as soon as possible and present the proper certification so that we may schedule a special exam.

Sample exams are posted on our site, <http://www.stat.upd.edu.ph/fcapistrano.htm>. I highly recommend that you work on the sample exams and discuss the answers with your groupmates/classmates.

- **Group Activities** The group activities will usually serve as a good exercise to develop the skills that will be tested in the exams. I recommend that you still work on the problems individually and discuss your solutions with the group. Learn from each other. Take full advantage of the opportunity to learn in a group discussion. At the end of the semester, you will be grading each member of the group and this will be one of the components of your final grade.
- **Attendance** I will always check your attendance at the end of the period. Whenever you are in class, I expect that you will be attentive during lectures and that you will participate in the discussions, especially in the exercises. You will realize that in doing so, you will be able to save a lot of time trying to understand the concepts on your own and be able to focus your attention in doing the exercises.

Grading System

4 Long Exams	80%
Group activities/members evaluation	15
Attendance	5

Grading Scale:

95 – 100	1	72 – 75	2.25
90 – 94	1.25	68 – 71	2.5
85 – 89	1.5	64 – 67	2.75
80 – 84	1.75	60 – 63	3
76 – 79	2	55 – 59	4
		54 or below	5

- At the end of the semester, I will announce the date for the final consultation period. In this period, I will return your last long exam. I will also show you the basis for your final grade. This will be your last opportunity to make any corrections or raise any questions on the computation of your grade.
- For those students who will get a grade of 4, please check the schedule of the removal exam. The removal exam will be a condensed version of the 4 long exams.
- Please inform me personally if you intend to drop from the course and follow the process for dropping on or before the last day of dropping.