SYLLABUS

Elementary Statistics

Math107 A

Fall 2009

Instructor: Ebrahim Ahmadizadeh

Location: PPHAC232

Time: MWF 7:30-8:40

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Textbook: Introduction to Statistics and Data Analysis, 3RD Edition, by Peck, Olsen and Devore. Thomson Brooks/Cole Publishing 2008.

Graphing Calculator and Technology: Graphing calculators and computer software will be used extensively in this course. Purchase of a TI-83 plus graphing calculator is highly recommended. The TI-83 plus will be used to demonstrate data analysis and calculations in class. Other calculators with two variable statistical capabilities may be used; some examples and a list of such calculators will be given in class.

Why Study Statistics?

Statistics is the science of gaining information from data. The use of data is increasingly common in many professions, in public policy, and in everyday life. For example:

- o On Election Day predictions of election results based on exit polls are made often hours before the polls close.
- o A Nielson television survey uses results from a sample of U.S households to form conclusions about the television viewing habits of all U.S. households.
- o Many medical Studies report that smoking increases an individual?s chance of dying from heart disease or cancer.
- o Baseball players are often ranked based on their batting average.

In all cases, once data has been collected it is important that such data is interpreted correctly.

The study of statistics will enable you to think critically about data so that you can analyze data, draw conclusions from that data, and make decisions based on the conclusions you draw. The study of statistics will also inform you of ways in which data can be misleading if used improperly.

Course Outcomes:

In this course you will learn to collect and interpret data, as well as understand and communicate statistical information. For example:

- When reading newspapers or magazines, listening to the radio, or watching TV, you will be able to analyze articles dealing with statistics and determine their validity.
- When analyzing statistical data, tables, and graphs you will be able to think critically about the information and analyze its validity, draw conclusions, and make educated decisions about the presented information.
- You will be able to design your own survey or experiment, collect data, analyze that data, and draw appropriate conclusions about the topic.
- You will be able to think critically and make decisions based on basic probability theory and probability of events
- You will be able to use statistics and probability knowledge gained in this course in your profession and real life applications.

   Topical Goals:

- In a statistical study you will be able to determine the population and the sample. You will be able to determine the technique of data collection.
- You will understand the importance of random sampling and will be able to obtain a random sample from a population.
- You will be able to collect real data and perform exploratory data analysis such as histograms, stem-and?leaf displays, and box-and-whisker plots with the data. You will learn to do this by hand, using a graphing calculator, or using computer software. You also be able to write a report describing your procedures and the conclusions you have reached.
- Given a set of data, you will be able to calculate the measure of central tendency and variation by hand and using a calculator. In a specified situation you will know which measures are applicable.
- You will understand regression and correlation. Using a calculator you will be able to find the linear regression equation and correlation coefficient for a data set. In addition you will be aware of the fact that correlation does not always mean causation.
- You will gain a basic knowledge of probability theory. You will be able to find the probability of an event using basic definitions of probability.

- You will be familiar with probability distributions in general and the binomial and normal distribution in particular. You will be able to solve problems based on these distributions.
- You will know the Central Limit Theorem and understand its importance in statistics.
- You will be able to use sample statistics to estimate population parameters, determine confidence intervals for estimates, and test hypotheses regarding the population parameters.
- You will be familiar with the x^2 distribution and will be able to use it to test the hypothesis that two variables are independent.
- You will be able to read a description of a statistical procedure not discussed in class and apply it to a set of data. For example, having covered in class the hypothesis test for mean, you will be able to read about and apply the hypothesis test for proportion.

To achieve the above course goals and outcomes sections from chapters 1 through 10 of the text will be covered.

Journal Entries:

Students are required to collect at least five articles related to statistics and/or probability from sources such as newspapers, magazines, research journals, the Internet, or other scientific sources and write a journal entry about the article and its conclusion. Students are encouraged to read articles about their own field of study.

Attendance Policy:

Students are expected to attend all class sessions of the course and are responsible for all materials presented in the class. Often group activities and projects will be completed in class. If you are absent, you will not get credit for that group activity or project. There is no make up for missed quizzes. Make up tests will be given only in case of valid excuse.

Attendance will be recorded by means of an attendance sheet.

All college policies regarding attendance will be followed.

Classroom Deportment:

Please turn off your cell phones. Each member of class is expected to be on time and act in a manner which respects the rights of all members of the class. Actions which are uncharacteristic of a college classroom will not be tolerated.

Help:

You are encouraged to ask questions in class or make an appointment when necessary. You can also email me with any questions regarding the course. Student tutors are available. Please check with the college regarding availability of such services during the semester.

Academic Honesty:

The academic honesty policies of both the university and the mathematics department will be strictly adhered to.

You are expected and encouraged to work together on group projects during the class. While a group of you working on a project may come up with a solution to a problem, your write up of the solution must be entirely your own and in your own words. Copying solutions from others or allowing others to copy from you or copying solutions from a solutions manual is unacceptable and will not be tolerated.

Methods of Evaluation (student assessment)

Students will be evaluated by means of tests, quizzes, classroom participation and activities, computer assignments, homework, group and individual projects, journal entries, and a comprehensive final exam.

Grades will be calculated as follows:

Homework   5%

Journal entries   5%

Individual and group projects   15%

4 Quizzes and 3 tests   55%

Comprehensive Final Exam 20%

One point per day will be deducted for late assignments.

If you miss a test you will be permitted to make it up only if you present a valid excuse in the next class period. Only one make up test will be given per student.

There will be NO make up quizzes.

All quiz and test dates will be announced in advance in class.

This syllabus is intended as a guide and it may be changed during the semester. I will announce any necessary changes in class.

Weekly Schedule

WEEK of Aug 31	Ch 1 The Role of Statistics	All homework assignments and projects will be given in class ch1 hw: ch1 concept quiz (will be handed out in class) Survey Project Estimating the Size activity

WEEK of Sept 7	Ch 1 quiz Ch 2 The Data analysis process and collecting data sensibly	ch2 hw: ch 2 concept quiz (will be handed out in class) Activity 2.1 Designing a Sampling Plan

WEEK of Sept 14	Ch2 quiz Ch 3 Graphical Methods for describing data	Activity 2.4 Speed Sorting ch3 hw: page 115 #25, 26, 27, 28, 30 , 31 Chapter 3 graphing calculator hand out

WEEK of Sept 21	Ch 1,2 &3 Test Ch 4 Numerical Methods for describing data sections 4.1, 4.2 ch4 hw: Page 156 #1, 2,5 page 166 #17, 18,19 Chapter 4 graphing calculator hand out

WEEK of Sept 28	Ch 4 Numerical Methods for describing data sections 4.3, 4.4 ch4 hw: page 192 Project, Activity 4.2 Boxplot shapes page 174 # 29, 30 . 33 page 193 # 55, 57, 58, 62 Project: Chocolate chip cookies

WEEK of Oct 5	Ch 5 Summarizing Bivariate data sections 5.1, 5.2 page 210 # 12, 13 Project: Sporting goods Sales Chapter 5 graphing calculator hand out Ch4 quiz

WEEK of Oct 12	Ch 5 Summarizing Bivariate data sections 5.3, 5.4, 5.5 page 218 # 18, 19, 22, 26 Page 253 # 57 U.S Population project

WEEK of Oct 19	Ch 4 & 5 Test Ch 6 Probability sections 6.1, 6.2, 6.3 HW Page 286 Problems 3, 5, 10 Page 300 problems 13, 17, 21, 26

WEEK of Oct 26	Ch 6 Probability sections 6.4, 6.5, 6.6, 6.7 chapter 6 graphing calculator hand out , examples and problems in the hand out HW Page 310 # 28, 29 page 320 # 42, 49 Page 332 # 59

WEEK of Nov 2	Ch 6 quiz Ch 7 Random Variable and Probability Distributions sections 1, 2, 3, and 4

WEEK of Nov 9	Ch 7 Random Variable and Probability Distributions sections 5, 6, 7, and 8 chapter 7 graphing calculator hand out, examples and problems in the hand out HW Page 407 problems 64, 65, 66, 70, 71, 73, 74, 76

WEEK of Nov 16	Ch 6 & 7 Test Ch 8 Sampling Variability and Sampling Distributions sections 1, 2, 3

WEEK of Nov 23		Ch 8

WEEK of Nov 30	Ch 8 quiz
	Ch 9 Estimation using a single sample; sections 9.1, 9.3

WEEL of Dec 7	Ch 10 Hypothesis Testing using a single sample; sections 10.1, 10.2
WEEK of Dec 14	Final