92.283 Introduction to Statistics Fall 2015

209, 210

Text: Custom Text based on

Moore/Notz/Fligner, The Basic Practice of Statistics 7th edition

Instructor: Anzhi Li

Instructor email: [Anzhi\_Li@uml.edu](mailto:Anzhi_Li@uml.edu)

Instructor webpage: <http://faculty.uml.edu/Anzhi_Li/>

Office Hours: 2:00 – 2:45 PM, Tue, Thurs

Office: Space near classroom in Riverview Suite

Class Schedule: 11:00 AM -12:15 PM, 12:30 PM- 1: 50 PM, Tuesday & Thursday

Note: All electronic communications must be via the UMass Lowell email system.

Course Objective

Statistics is used in many disciplines to determine whether a particular treatment, trend, change in process, etc. are significant. This course is intended to provide the student with basic statistical skills to allow them to analyze data as well as the ability to understand data that is presented, whether in a journal or to assist in decisions making. Topics to be covered include:

* Graphical and analytical representation of data
* Collection of data
* Understanding of Basic probability
* Conclusions from data, statistical inference

Technology will be used throughout the course utilizing excel. Data files for some of the examples in the book and some homework problems may be downloaded using the link <http://bcs.whfreeman.com/bps7e/#t_937162____> . You can select excel files to download by clicking Data Sets and then clicking Data Sets Excel and then follow instructions on the screen.

Attendance

In order to encourage attendance, attendance will be taken at most classes through the semester. A student with no absences will be awarded a 5 point bonus onto their final course grade. Each unexcused absences beyond 1 will result in a half point reduction in the student’s final course grade. As an example, a student with 5 unexcused absences will have their final course grade reduced by 2 points. In order to have an absence excused either a doctor’s note or a note from the dean will be required. At the instructor’s discretion the requirement for a written excuse may be waived.

Homework

Homework is required and will be assigned for each chapter covered and an opportunity for questions will be given in class. In addition to the homework assigned from the book there will be 4 additional homework assignments using technology that will be graded and account for 20% of the final grade. Note the final homework assignment to be collected may encompass concepts covered throughout the semester and be weighed as 2 assignments (assignments 3 and 4).

Grading

Homework will account for 20% of the final grade as indicated above. There will be two in class 50 minute exams. The 2 exams will account for 40% of the final grade. The final exam will count as 25% of the final grade. The use of a calculator and equations listed on a sheet of paper both sides are allowed for the three exams. There will be between 4 and 6 in class quizzes, 10 to 15 minute each, which will count as 15 % of the final grade. The quizzes will be similar to the problems from the homework. Calculators maybe used for quizzes. Missed exams or quizzes due to an absence can only be made up if the absence is excused. Final grade averages, will be adjusted per the attendance policy. Participation in class will be recognized as an asset in final grade evaluation. Under no circumstances can cell phone calculators be used on exams or quizzes.

Course grade assignments will be based on the final course average as follows: 94-100 A, 90-93 A-, 87-89 B+, 84-86 B, 80-83 B-, 77-79 C+, 74-76 C, 70-73 C-, 67-69 D+, 64-66 D, 0-63 F. Arrangements are possible in individual sections for adjusted weights to be assigned in order to enhance individual overall performances.

The tentative schedule for in class exams is:

Exam 1 Chapters 1 – 9 week of October 5th

Exam 2 Chapters 12 – 18 week of November 2nd

Note: The material covered in each exam and schedule may be changed as circumstances dictate.

Other

Assuming eligibility, at least two weeks prior to any announced exam, arrangements must be made with the instructor for extended time. Extended time will refer to time allotted on the day of the scheduled exam. In the case of the final exam, arrangements must be made at least two weeks prior to the end of scheduled classes.

Procedures about academic integrity are described in the university catalog at <http://www.uml.edu/Catalog/Undergraduate/Policies/Academic-Integrity.aspx>. As necessary, sanctions may be imposed on any student who has committed an act of academic dishonesty. In such cases, the student will be informed within 14 days after the incident has been recognized and the provost’s office will be notified within 10 days after student notification.

University retention policy has requested that there be a bi-weekly evaluation of student attendance, performance, and behavior in class. It will be implemented. The purpose of this evaluation is to inform the university administration of student status in this course and enable them to provide timely feedback as necessary to students.

Syllabus: 92.283 Introduction to Statistics,

Sections

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Chapter 1

Picturing Distributions with Graphs

* Individuals and variables
* Categorical variables: pie charts and bar graphs
* Quantitative variables: histograms, stemplots and time series plot

Chapter 2

Describing Distributions with Numbers

* Measuring center: the mean and median
* Measuring spread: quartiles, boxplots and standard deviation

Chapter 3

The Normal Distributions

* Density curves
* Normal distributions

Chapter 4

Scatterplots and Correlation

* Explanatory and response variables
* Scatterplots/correlation

Chapter 5

Regression

* Regression lines
* Least-squares regression line

Chapter 6

Two-Way Tables

* Marginal Distributions
* Conditional Distributions

Chapter 8

Producing Data: Sampling

* Population versus sample
* Simple random samples

Chapter 9

Producing Data: Experiments

* Observation versus experiment
* Subjects, factors, treatments
* Randomized comparative experiments

Chapter 12

Introducing Probability

* The idea of probability
* Probability models
* Probability rules
* Continuous probability models
* Random variables

Chapter 13

General Rules of Probability

* Multiplication Rule
* Addition Rule
* Conditional Probability

Chapter 15

Sampling Distributions

* Parameters and statistics
* Sampling distributions
* The central limit theorem

Chapter 16

Confidence Intervals: The Basics

* The reasoning of statistical estimation
* Confidence intervals for a population mean
* How confidence intervals behave

Chapter 17

Tests of Significance: The Basics

* The reasoning of tests of significance
* Stating hypotheses
* Tests for a population mean
* Statistical significance

Chapter 18

Inference in Practice

* Conditions for inference
* Sample size for confidence intervals

Chapter 20

Inference about a Population Mean

* The t distributions
* The one-sample t confidence interval and the one-sample t test
* Matched pairs t procedures
* Robustness of t procedures

Chapter 21

Comparing Two Means

* Comparing two population means
* Two-Sample t procedures

Chapter 27

One-Way Analysis of Variance: Comparing Several Means

* The analysis of variance F test
* The Idea of ANOVA

Chapter 22

Inference about a Population Proportion

* The sample proportion
* Confidence intervals for a proportion
* Choosing the sample size
* Significance tests for a proportion

Chapter 25

Two Categorical Variables: The Chi-Square Test

* Two-way tables
* Expected counts in two-way table
* The chi-square test
* The chi-square distributions

Note: The material covered may be modified as circumstances dictate.

List of Homework Assignments by Chapter

Chapter Problems

1 1.24, 1.26, 1.35, 1.38, 1.45

2 2.27, 2.29, 2.44, 2.46

3 3.28, 3.32, 3.33, 3.34, 3.42, 3.44

4 4.26, 4.28 (*a*), 4.30, 4.43, 4.46

5 5.33, 5.41, 5.42, 5.61, 5.62

6 6.19, 6.31

8 & 9 8.35, 9.50

12 12.33, 12.45, 12.47, 12.49, 12.51, 12.52

13 13.31, 13.36, 13.41

15 15.29, 15.32, 15.38, 15.41

16 16.20, 16.26

17 17.31, 17.41, 17.43

18 18.43

20 20.29, 20.34, 20.35, 20.51, 20.52

21 21.28, 21.34, 21.35, 21.37, 21.45

27 27.35, 27.37

22 22.31, 22.37, 22.40

25 25.42, 25.43, 25.47

Disregard the Minitab output when shown. Compute what you need, use of excel when feasible.

Homework assignments may be modified.