

STATISTICS 110B
Fall 2002
Professor: Mahtash Esfandiari

Lecture Two Time: 11 – 12 MWF
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Goal and requirements: The major goal of this class is to show the students how statistical inference and hypothesis testing can be used to answer questions about the real world. In statistics 110A you were introduced to the basic concepts in probability, selected theoretical distribution, key aspects of experimental designs, the basic concepts of inference, constructing and interpreting confidence intervals, and conducting hypothesis tests for means, proportions, and the difference between means and proportions in large samples and small samples.

This class will start with two-sample tests and then move onto simple linear regression, multiple linear regression, analysis of variance, comparison of anova and regression, and contingency tables.

In order to do well in the homeworks and the exams, you are expected to attend all the classes and the computer sessions. You will not be able to succeed in this class just by trying to keep up with the readings and attempting the homeworks. You are expected to read the assigned material before coming to class and participate in discussions and answer questions.

Statistical software: We will use SPSS as the statistical software. This software is available in on the first and the first floor of the Powell Library. However, you can access to SPSS on the first floor of the Powell Library during the times that the library is open.

References:

Assigned book: Devore, J. "Probability and Statistics for Engineering and Sciences". (2000), Third Edition, Duxbury.

prerequisite concepts and calculations: In order for you to follow the discussions in this class, you should be familiar with the following concepts and calculations. The review exercise and the answers provided should help you in this regard.

- Basic concepts of descriptive statistics including the mean, median, variance, standard deviation, covariance, and correlation
- Sampling distribution, the Central Limit Theorem, the normal distribution, and the student's t-distribution.
- Basic concepts of inference
- Inference for single samples (mean and percentage)

Computer Lab: The computer lab is a very important part of this course. You should not miss the labs. The computer labs are held in classroom C on the third level of the Powell Library. By attending the lab you will learn how to analyze the relevant data. Additionally, a major part of your midterm and final exam will be reading printouts and interpreting the relevant results. Thus, if you do not attend the lab, you will have difficulty doing the homework and doing well in the exams.

Articles and supplemental handouts: Throughout the quarter you will be provided with supplemental handout and articles. The major objective of the handouts is to give you a chance to listen during lecture rather than take notes all the time. Another objective of the handouts is to give you sample computer printouts and teach you how to interpret and verbalize the obtained results. The objective of the articles is to show you the real world application of the statistical methods discussed in the course.

OUTLINE
TENTATIVE SCHEDULE

Date	Topic s and list of readings	Event
Week 0 September 27	Review Chapter 8: 8: 8.1-8.4	Introduction to the class
Week 1: September 30- October 4	Tests of hypotheses based on a single sample. Chapter 8: 8.1-8.4	HW 1 assigned Wednesday: Lab 1
Week 2: October 7- 11	Comparing the differences between two populations continued: Chapter 9: 9.1-9.4	HW 1 due on Wednesday HW 2 assigned Wednesday: Lab 2
Week 3: October 14- 18	Single-factor ANOVA: 10.1-10.3	HW 2 due on Wednesday HW 3 assigned Wednesday: Lab 3
Week 4: October 21- 25	Two-factor ANOVA with $K_{ij} > 1$ Chapter 11: 11.2-11.4	HW 3 due on Wednesday HW 4 assigned Monday: Lab 4
Week 5: October 28- November 1	Monday: Will answer questions on homework 4 or take-home midterm	Monday and Wednesday review HW 4 or take-home midterm due on Friday Friday Friday: In class midterm
Week 6: November 4-8	Simple linear regression and correlation Chapter 12: 12.1-12.5	HW 5 assigned No homework due Wednesday: Lab 5
Week 7: November 11-15	Simple linear regression continued: Chapter 12: 12.1-12.5 Multiple linear regression: Chapter 13: 13.1-13.5	No HW due Monday November 11: Holiday Friday: Lab 6
Week 8: November 18-22	Multiple linear regression continued: Chapter 13: 13.1-13.5	HW 5 due Wednesday HW 6 assigned Wednesday Lab 7
Week 9: November 25-29	Comparison of multiple linear regression and anova (dummy coding): Analysis of categorical data: Chapter 14: 14.1-14.3	No HW due Wednesday: Lab 8 Thanksgiving vacation 28-29
Week 10: December 2-6	Review for the final and answering questions on take-home final	No HW due No Lab Review: Wednesday and Friday
Week 11: December 9-13	Final Exam: Thursday December 12, 2002, 3:00 PM to 6:00 PM	HW 6 or take home final is due on December 12 at the time of the final

Tests

There is one midterm and a final exam. Both exams have a take-home part and an in-class part. The final exam is cumulative but more emphasis will be placed on the material presented in the latter part (second half) of the course. All exams are open book and open note. You can use a calculator.

Missed exams and Grade Appeals

If you have any questions about your midterm grade, you have 48 hours to hand me a written note regarding why you think your grade needs to be changed. Please attach your note to the midterm. Since the Teaching Assistant is busy with other things, please do not bother him about the grade change. I will handle all the matters regarding change of grading.

Make-up exams are given only in extremely exceptional circumstances. You need to present documents that show why you were not able to attend the examination. Make up exams will be written and they will be administered on an individual basis.

Students sometimes request to take the final early and this request is VERY DIFFICULT to grant. Please mark the final examination date on your calendar and do not travel on this date.

Grading

- Homework 15%
- Midterm 35%
Take-home midterm will be 25% of your midterm grade and in-class midterm will be 75% of your midterm grade.
- Final 50%
 - Take-home final will be 25% of your final grade and in-class final will be 75% of your midterm grade.

Incompletes: "I"

An incomplete grade is given when:

- The student has turned in all the homeworks
- The student has taken and passed the midterm
- The student has an ironclad reason for not taking the final. The student should be able to document why s(he) was unable to take the final.

Homeworks

- There will be six homeworks:
- Homeworks 1, 2, 3, and 5 will count toward 15% of your grade. The homework with the lowest grade will be dropped.
- Homeworks 4 and 6 are counted as take-home midterm and take-home final and they will not be dropped.
- Homework are turned in lecture. Late homeworks are not accepted and will be given a grade of zero

Data sets

The supplemental handouts, some of the homework problems, and exams will be based on the data sets that have resulted from the instructors' research on the evaluation of educational interventions.

