PS292: INTRODUCTION TO STATISTICS
Course Outline

Instructor: Robert Gebotys

Office: Science bldg 2075B

Office Hrs.: Wed and Friday 11:30-1230

Text:
- **Introduction to the Practice of Statistics by Moore and McCabe (5th edition)**
- **SPSS manual (in Notes on Website).**
  http://www.wlu.ca/~wwwpsych/gebotys

Syllabus: **we will cover most of the book**
-Chapters 1-10, 12
about a week each

Evaluation: **Quizzes 30% (about 10 @ 3 %),**
Midterm 20%
Final 50%

The next page lists the material to be covered. The relevant sections of the text are listed as well as the timing and content of the quizzes. The main web page also gives content and key word descriptions for each chapter.

<u>Material to be covered</u> in the text and notes: about 1 week per chapter , an approximate schedule for each chapter is given below ,the approximate amount of time per chapter is given in brackets. You can also click the weekly schedule on the webct home page.

Practice Quiz - try this to gain experience with the software.

Chapter 1 - Intro, 1.1,1.2,1.3 ALL - drop pg.51 change in Unit

Chapter One: Looking at Data (1.5 weeks)

Variables and Graphs

- Variables
- Graphs for Categorical Variables
- Stemplots

Numerical Summary of Data

- Mean as center of the distribution
- Median as center of the distribution
- Spread using quartiles
- Spread using the interquantity range
- Boxplots
- Standard deviation as spread

Normal Distribution

- Normal distributions
- Standardized (z) observations

Standard normal curve
Calculations with the normal
Normal quantile or probability plots

Chapter 2 - Intro, 2.1, 2.2, 2.3, 2.4, 2.5

Chapter Two: Relationships (1.5 weeks)

Scatter plots
Interpreting scatter plots

Least Square Regression
fitting a line to data
prediction and residuals
Least square regression

Correlation
correlation r
r squared - coefficient of determination
examples

Categorical Data
describing relationships
conditional distributions
Simpsons paradox

Causation

Quiz 1 and 2 -Chapters 1 and 2 are to be covered

Chapter 3 - Intro, 3.1, 3.2, 3.3, 3.4

Chapter Three: Producing Data (.5 week)

Design of Experiments
- Randomization
- How to Randomize
- Simple Random Sampling

Statistical Inference Foundations
- Sampling Variability
- Sampling Distribution
- Variability of a statistic

Chapter 4 - Intro, 4.1,4.2

Chapter Four: Probability (.5 week)

Randomness
- Language of Probability
- Uses of Probability
- Probability values

Chapter 5 - Intro, 5.1, to page 378, 5.2

Chapter Five: Inference (1 week)

- Sampling distribution for Proportions and Counts
  - Sample proportions
  - Normal Approximation

- Sampling distribution for the Mean
  - Mean and Standard Deviation

Sampling Distribution
Central Limit Theorm

Quiz 3 and 4 -Chapters 3, 4 and 5 to be covered

Chapter 6 - Intro, 6.1, 6.2, 6.3

Chapter Six: Confidence and Significance (1.5 week)

Confidence Intervals
Confidence Intervals in General
Confidence Internal for a population mean
How confidence Internals Behave

Tests of Significance
Reasoning of the Test
Hypothesis
Test Statistic
P-values
Tests for a Population Mean
Fixed Level Tests
Statistical Significance vs. Practical Significance

Chapter 7 - Intro, 7.1, 7.2, 7.3, to page 556

Chapter Seven: Inference for Distributions (1.5 week)

Inference for the Mean of a Population
t distribution
one sample ***t*** test
one sample confidence interval
Matched Pairs ***t*** test

Comparing two Means
- two sample Z test
- two sample ***t*** test
- two sample confidence internal

Comparing Spread of Distributions

- Inference for Spread the Chi-Square Distribution
- F Test for Equality of Spread in Two Populations

Quiz 5 and 6 -Chapters 6 and 7 to be covered

Chapter 8 - Intro, 8.1, 8.2

Chapter Eight: Inference for Proportions (.5 week)

Single Proportion
- Confidence Internal
- Significance Test

Comparing Two Proportions
- Confidence Internals
- Significance Tests

Chapter 9 - Intro, 9.1, 9.2, 9.3

Chapter Nine: Two Way Tables (.5 week)

Inference for Two Way Fables
- The Two Way Table
- Hypothesis of No Relationship

Expected Cell Counts
Chi-Square Test

Quiz 7 and 8 -Chapters 8 and 9 to be covered
Chapter 10 - Intro, 10.1, 10.2

Chapter Ten: Inference for Regression (1.5 week)

Simple Linear Regression
Model for Regression
Estimating Parameters
Confidence Internals
Significance tests

ANOVA for Regression
The ANOVA table
The F test
Inference for the Slope

Chapter 12 - Intro, 12.1,12.2 to pg 775

Chapter Twelve: One Way Analysis of Variance (1.5 week)

Comparing Means
Two Sample ***t***
ANOVA Hypothesis
The ANOVA model
Testing Hypothesis
ANOVA table
F test
Contrasts
Multiple Comparisons

Quiz 9-10 -Chapters 10 and 12 to be covered

PRACTICE ASSIGNMENTS

After completing the practice assignment(they are not graded)-click on the answers and see if you have solved the problem correctly. There are many examples in the notes and text,here are some more.

CHAPTER 1	**-**	**1.17, 1.20, 1.43, 1.81, 1.93, 1.94 (SPSS)**
CHAPTER 2	**-**	**2.5, 2.35, 2.55 (use SPSS, also obtain the correlation and r-squared), 2.96**
CHAPTER 3	**-**	**3.5, 3.37, 3.38, 3.42, run SPSS p. 11 use SPSS template that is given**
CHAPTER 4	**-**	**4.15, 4.23**
CHAPTER 5	**-**	**5.8a, 5.26, 5.29**
CHAPTER 6	**-**	**6.1, 6.4, 6.9, 6.35a, 6.39 (SPSS), Run(SPSS) C.I. template on pg 9**

CHAPTER 7 - **7.23, 7.35 (SPSS), 7.63, 7.67 (SPSS), 7.87**

CHAPTER 8&9 - **8.16, 8.38, 9.17 (SPSS)**

CHAPTER 10 - **10.8, 10.9, 10.10 (SPSS)**

CHAPTER 12 - **12.1 (SPSS), 12.22**

How to do well in the course

- ask for help

Steady Work = success

- Do the readings! Students usually do the readings in the text book first. They then read the notes , view the videos and try the practice assignments given for the chapter. The exercise problems are listed for extra practice if needed.

Remember: Tips for Success

1) **Read the text.**
2) **Read the notes.**
3) **Try the assignment.**
4) **If needed, try the exercise questions.**
5) **Try the link to the Virtual Statistics Lab if you need more help with a concept.**
6) **Try the self tests for practice on each chapter of**

the text at www.whfreeman.com/ips. These are for extra practice and are not graded.

7) Steady work = success

You are responsible for all the material assigned for reading.

The quizzes are 'open book'.

Notes - copies available from website - click on CHAPTER 1 to obtain a copy of the chapter one notes. Videos and SPSS software are available from the university-please arrange to obtain them as soon as possible

– try the links to other useful sites to gain a better understanding of the concepts

– if you need a review of basic math skills, try the math review

– more self tests for each chapter are available at www.whfreeman.com/ips. Try them to help you understand the material. They are not graded.

– your instructor will give you the dates for

the quizzes(they are listed in the quiz section of webct). Try the practice quiz to gain some experience with the web software.

-the course can be viewed as 12 lessons. The amount of time per lesson is given in brackets. Please see the weekly schedule in WebCT for more information.

12 Lessons

Lesson 1-Getting Started (.5 weeks)

- Logon to Website
- Download and install copy of Adobe Acrobat Reader
-Look at the quick intro to webCT and Adobe links
- Look at Math Review and try some questions if necessary
-click on CHAPTER 1 to obtain a copy of the chapter one notes
- Obtain and install SPSS software
- Work through the SPSS Manual, try the commands, get some practice with the software ,the course will teach you how to interpret the SPSS output
- Try the link to the Virtual Statistics Lab
- Try the Practice Quiz to become familiar with the procedure for taking a quiz-click quiz in webCT

Lesson 2 (1 week) - Chapter One Material

Lesson 3 (1.5 weeks) - Chapter Two Material

Lesson 4 (.5 week) - Chapter Three Material

Lesson 5 (.5 week) - Chapter Four Material

Lesson 6 (1 week) - Chapter Five Material

Lesson 7 (1.5 weeks) - Chapter Six Material
Lesson 8 (1.5 weeks) - Chapter Seven Material
Lesson 9 (.5 week) - Chapter Eight Material
Lesson 10 (.5 week) - Chapter Nine Material
Lesson 11 (1.5 weeks) - Chapter Ten Material
Lesson 12 (1.5 weeks) - Chapter Twelve Material

IMPORTANT INFORMATION FOR STUDENTS

Examination Deferrals:
The Academic Date section of the Calendar (Printed and Web Site Versions) clearly states the examination date period for each semester. Students must note that they are required to reserve this time in their personal calendars for the examinations. **The examination period is April 6 - 27, 2006 for Winter Term.** Students who are considering registering to write MCAT, LSAT or GMAT or a similar examination, should select a time for those examinations that occurs outside the University examination period. For additional information regarding Deferred Examinations, please refer to *Examinations: Deferred* in the Undergraduate Academic Calendar.

Academic Misconduct:
Academic misconduct is an act by a student, or by students working on a team project, which may result in a false evaluation of the student(s), or which represents a deliberate attempt to unfairly gain an academic advantage. For additional information regarding Academic Misconduct, please refer to *Academic and Research Misconduct* in the Undergraduate Academic Calendar.

Plagiarism:
Wilfrid Laurier University uses software that can check for plagiarism. Students may be required to submit their written work in electronic form and have it checked for plagiarism.

Accessible Learning (Special Needs):
Students with disabilities or special needs are advised to contact Laurier's Accessible Learning (Special Needs) Office for information regarding its services and resources. Students are encouraged to review the Undergraduate Academic Calendar for information regarding all services available on campus.

Important Dates:
For important dates to remember, such as last day to drop a course: Please refer to *Academic Dates* at the front of the Undergraduate Academic Calendar.