

Statistics xl 10 : Introduction to Statistical Reasoning

Meetings Dates: June 23rd 2010 - September 8, 2010

Meeting Location: Franz Hall 1260

Instructor: Kekona Sorenson

Email: [REDACTED]

Website for course materials: www.kekonakai.com

Office : Math Sciences [REDACTED]

Office Hours: Wednesdays 5-6:50PM or by appointment

Goal of course:

The overall goal of this class is to introduce you to the discipline of statistics as a science of understanding and analyzing data and not as a branch of mathematics. After finishing this class you will be able to use statistics to solve real world problems and have a better understanding of the process of scientific research and testability.

We plan to achieve the above goal by introducing you to the relevant statistical knowledge, teaching you how to use an open source (i.e. FREE!) statistical software called R to perform data analysis, and having you engage in problem solving, application, analysis, and synthesis of statistical information through homework, labs, quizzes, and exams.

Required Textbook:

The required textbook for this course is Intro Stats:Custom Edition for UCLA (2009) by De Veaux, R.D., Velleman, P.F., and Bock; Pearson Education Inc. ISBN: 0-536-87134-5. All other course materials will be posted on the class website and/or handed out in class.

Unbreakable Rules:

1. NO LATE WORK! (An assignment is late if its turned in later than 5 minutes after start of class)
2. NO CHEATING! (If there is evidence of cheating, student will be referred to Dean of students)
3. NO MAKE UP ASSIGNMENTS/EXAMS! (Check schedule now and adjust accordingly)

Grading Scheme:

1. Homework/Lab - 15% (Respective Assignments Due: Weeks 3, 5, 8, 10, 11)
2. In class quizzes - 25% (Respective Quizzes: Weeks 3, 4, 5, 8, 9, 10)
3. Midterm Exam - 30% (Week 6 - July 28th)
4. Final Exam - 30% (Week 12 - September 8th)

Other points of interest:

1. There will be 6 quizzes this quarter. In class quizzes will be commence at 7:05PM, and will last about 15 minutes. The lowest quiz will be dropped at end of quarter
2. There will be 4 HW assignments and 1 lab this quarter. Lowest HW assignment will be dropped at the end of the quarter. HW assignments will come from the text book and will be posted to my website (www.kekonakai.com)
3. There will be a midterm and final exam. You will be allowed to have ONE sheet of notes for the exams (front and back ok)
4. You will be given a 15 minute break at 7:50PM and 8:50PM

Official UNEX announcements:

1. Students can access and update student records online by visiting: www.uclaextension.edu and logging in. This is where you can view your final grades. Final grades will not be disclosed on an individual basis.
2. If you need any accommodations for a disability, please contact the UCLA Extension Disabled Student Services directly at (310) 825-7851 or via e-mail: access@uclaextension.edu.

Course Outline:

1. **Lecture 1 June 23 : Exploring Data**
 - (a) What is data?
 - i. Population vs. Sample (Chapter 2)
 - ii. Observational units (Chapter 2)
 - iii. Categorical and quantitative variables (Chapter 3, 4)
 - (b) Displaying and describing CATEGORICAL variables (Chapter 3)
 - i. Definition
 - ii. Summarizing
 - A. Data tables
 - B. Frequency tables
 - C. Contingency tables
 - D. Independence
 - iii. Displaying
 - A. Bar chart (segmented and non-segmented)
 - B. Pie chart
 - (c) Displaying and describing QUANTITATIVE variables (Chapter 4)
 - i. Definition
 - ii. Summarizing
 - A. Measures of central tendency (Mean, median, mode)
 - B. Measures of spread (S.D., IQR, VAR)
 - C. 5 number summary
 - iii. Displaying
 - A. Histograms
 - B. Stem-and-Leaf
 - C. Box plots
 - D. Shape(modality, symmetry, outliers)
 - (d) Comparing Distributions (Chapter 5)
2. **Lecture 2 June 30th : The normal model** (Chapter 6)
3. **Lecture 3 July 7th : Producing Data** (Chapters 12, 13)
 - (a) Principles of experimental design and causal inference
 - (b) Observational studies and non-causal inference
 - (c) Surveys
 - (d) Simulations
4. **Lecture 4 July 14th : Randomness, Simulations, Probability Models** (Chapter 14-17)
5. **Lecture 5 July 21st - Review**
6. **Lecture 6 July 28th - Midterm**
7. **Lectures 7-9 August 4th - August 18th : Inferential Statistics**
 - (a) Sampling Distributions and the Central Limit Theorem
 - (b) Inference for Proportions (Chapters 18-22)
 - i. 1 and 2 sample confidence intervals
 - ii. 1 and 2 sample hypothesis tests
 - (c) Inference for Means (Chapters 23, 24)
 - i. 1 and 2 sample confidence intervals
 - ii. 1 and 2 sample hypothesis tests
8. **Lecture 10 August 25th : Linear models, exploring relationships** (Chapters 7-9)
9. **Lecture 11 September 1st : Review**
10. **Lecture 12 September 8th: Final Exam**