Math 130: Introductory Statistics
Instructor: James Murray, Ph.D.
Summer 2009

Course Description

This course gives learners the quantitative tools to be able to use data to answer interesting, real world, questions. Given this goal, the course involves some use of mathematical and computer tools. Topics in course include descriptive statistics of center, spread and shape, hypothesis testing about proportions, means, medians, difference in means and medians, inferences on correlation and independence, and principles of ordinary least squares linear regression analysis.

Instructor Information

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Student Learning Outcomes

1. Students will be able to describe data using graphical methods and common descriptive statistics measures.
2. Students will be able to conduct and use hypothesis testing and confidence intervals (concerning proportions, means, difference in two or more means, inferences on correlation and independence, and linear regression) to answer common research questions. Students will be able to conduct hypothesis tests and correctly interpret the results.
3. Students will be able to interpret the meaning, validity, completeness, and appropriateness of statistics quotes common in daily news, advertising, etc.

On-line Resources

Much of the material used in class will be posted on the class website:
`http://www.murraylax.org/math130/summer2009/` Blackboard will be used for regularly posting grades and posting communication.

Course Reading

Required Textbook: Triola, Mario F. *Elementary Statistics*, 11th Edition. Pearson.

Assessment

Learning will be assessed through weekly quizzes, homework, and exams. The grading breakdown will be:

Attendance / Participation (see rubric): 10%

Homework: 10%

Quizzes: 15%

Exam 1: 20%

Exam 2: 20%

Final Exam: 25%

Grade Breakdown

93-100	A	69-76	C
89-92	AB	65-68	CD
81-88	B	57-64	D
77-80	BC	0-56	F

I reserve the right to scale everyone's grade up by the same amount on any graded item in the event that much of the class falls short of the scale above. However, even if the grades are significantly low, there is no guarantee that I will ever do this.

Homework / Quizzes / In-class exercises

There will be a number of homework assignments given throughout the semester involving problems from the textbook. The homework assignments will be graded primarily on effort.

There will be a quiz almost every week. Adequate preparation for the quiz will involve reading ahead for class and completing weekly homework assignments. Classes will begin with your questions so that you can resolve any problems with assigned work before the quiz begins. Quizzes may sometimes be open book and/or open note.
There will be a number of in-class exercises throughout the semester. This is to let you get some practice with statistics in the classroom before taking a quiz or sending you on your own for a week. To do well in the class, it is in your best interest to be actively involved in the in-class exercises, however the in-class exercises will not graded. An exception may be made if lack of participation becomes a problem.

Exams

There will be three midterm exams and one cumulative final exam. The first two exams are worth 20% of the final course grade, and the final exam is worth 25% of the final course grade.

Attendance

Attendance is always required, and regular attendance and active participation are worth 10% of your final course grade (see rubric). If you need to miss a class day or exam day for a **documentable, verifiable emergency** (serious sickness, death in the family, etc) you can be excused *if you notify me within two business days after the absence*. It is up to the instructor's discretion to require documentation for the absence. In such a case, if your documentation is successfully verified by someone with appropriate authority, you will be allowed to make up missed work.

Disabilities

If you desire classroom/testing accommodations for a disability, see Jane Eddy in Murphy Center 332, or call her at (608) 796-3194, to discuss your accommodation needs. The appropriate accommodations will be provided when her office contacts me about your needs, or your present to me the appropriate paperwork from her office. No accommodation should be assumed until authorized by your instructor.

Academic Dishonesty

I follow the policy in the Academic Handbook with regard to cheating and academic dishonesty. In the event a student is caught cheating I will pursue the harshest penalty Viterbo University will allow and report the incident to the Academic Vice President, regardless of how small the offense may appear.

Table 1: Class Participation Rubric

Criteria	Above Average	Average	Below Average
Attendance / Promptness	Learner promptly attends **at least all but one** class.	Learner is late and/or misses between **two and three classes**.	Learner is late and/or misses **more than three classes**.
	16-20 points	8-15 points	0-7 points
Participation	Learner actively contributes to class by offering ideas and answering questions on average **at least once per class**.	Learner will go through **between one and three classes** not offering any ideas or answering any questions.	Learner will go through **more than three classes** not offering any ideas or answering any questions.
	16-20 points	8-15 points	0-7 points
Listening Skills	Learner **always listens** when others talk, and through participation, **builds off or incorporates** the ideas of others.	Learner **sometimes fails to listen** when others talk.	Learner **often fails to listen** when others talk.
	16-20 points	8-15 points	0-7 points
Behavior	Student **never** has private conversations, is disrespectful of others, nor is otherwise disruptive.	Student **very occasionally** has private conversations, is disrespectful of others, nor is otherwise disruptive.	Student **often** has private conversations, is disrespectful of others, nor is otherwise disruptive.
	16-20 points	8-15 points	0-7 points
Preparation	Student **always** demonstrates she/he **is prepared** with assignments and reading for **every** class.	Student demonstrates she/he is **not prepared** with assignments and reading for **between one and three** classes.	Student demonstrates she/he is **not prepared** with assignments and reading for **more than three** classes.
	16-20 points	8-15 points	0-7 points

Preliminary Topics Schedule

Below is a schedule of topics, homework assignments, readings, and exams. This is a preliminary schedule; depending on time constraints and the topics the class finds most interesting, we may choose to not cover some of the items below, cover items that are not shown below, or re-arrange the schedule. The exam dates, however, will occur at the posted dates.

Week 1: May 12

- *Topics:* Meet and greet, discuss syllabus, frequency distributions, measures of center.
- *Required reading:*
  - Frequency distributions: Triola, Sections 2-2, 2-3.
  - Measures of center: Triola, Sections 3-1, 3-2.

Week 2: May 19

- *Topics:* Measures of variation, relative standing.
- *Required reading:*
  - Variation: Triola, Section 3-3.
  - Relative Standing: Triola, Section 3-4

Week 3: May 26

- *Topics:* Introduction to probability, probability distributions, normal distribution.
- *Required reading:*
  - Intro to probability: Triola, Chapter 4, all sections.
  - Probability distributions: Triola, Sections 5-1 through 5-4.
  - Normal distribution: 6-1, 6-2.

Week 4: June 2

- *Homework due:* Tuesday, February 3 - HW on Probability.
- *Topics:* Probability distributions, normal distribution.
- *Required reading:*
  - Probability distributions: Triola, Sections 5-1, 5-2.
  - Normal distribution: Triola, Sections 6-2, 6-3.

Week 5: June 9

- **Exam 1**
- *Topics:* Sampling distribution / Central limit theorem.
- *Required reading:* Triola, Sections 6-4, 6-5.

Week 6: June 16

- *Topics:* Central Limit Theorem continued, Hypothesis testing about means (pop. variance known).
- *Required reading:*
  - Central Limit Theorem: Triola, Sections 6-5.
  - Hypothesis testing about means: Section 8-1, 8-2, 8-4.

Week 7: June 23

- *Topics:*
  - Hypothesis testing about means (pop. variance unknown)
  - Hypothesis testing about proportions.
- *Required reading:*
  - Hypothesis testing about means: Triola, Section 8-5.
  - Proportions: Triola, Section 8-3.

Holiday Break: June 30

Week 8: July 7

- *Topics:* Confidence Intervals about means (with pop. variance known/unknown) and proportions.
- *Required reading:*
  - Confidence intervals: Triola, Sections 7-1 through 7-4.
  - Inferences on differences: Triola, Sections 9-1, 9-3, 9-4.

Week 9: July 14

- *Topics:* Chi-squared tests of independence, correlation.
- *Required reading:*
  - Tests of independence: Triola, Section 11-1 through 11-3.
  - Correlation: Triola, Section 10-2.

Week 10: July 21

- **Exam 2**
- *Topics:* Simple linear regression
- *Required reading:* Triola, Section 10-3.

Week 11: July 28

- *Topics:* Simple regression / multiple regression.
- *Required reading:*
  - Triola, Sections 10-3, 10-4, 10-5.
  - Delucchi, Michael. 1993. "Academic Performance in a College Town." *Education* 114: 96-100.

Week 12: August 4

- *Topics:* Analysis of Variance.
- *Required reading:*
  - Triola - Sections 12-1, 12-2.

Week 13: August 11

- **Final Exam**
