

Mgmt 230: Introductory Statistics for Business and Management
Instructor: James Murray, Ph.D.
Spring 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

James Murray, Ph.D.
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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 use hypothesis testing (concerning proportions, means, medians, difference in means and medians, inferences on correlation and independence, and linear regression) to answer common research and business questions. Students will be able to conduct hypothesis tests and correctly interpret the results.
3. Students will be able to use computer technology, including Microsoft Excel, to conduct descriptive and inferential statistics.
4. Students will be able to choose the appropriate hypothesis test(s), among an entire statistical tool set, in order to answer a relevant business or research question.
5. 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/m230/spring2009/> Blackboard will be used for regularly posting grades and posting communication.

Office Hours

Regular office hours are 9:30am to 10:30am and 2:00pm to 3:00pm, Tuesdays and Thursdays. These are times when you can drop by announced and expect me to be in my office. I encourage you to not feel limited to these times and just shoot me an e-mail if you would like to meet at an alternative time.

Outside of my regularly scheduled office hours, my availability changes all the time. You can visit my calendar at
<http://www.murraylax.org/calendar.html>. It is constantly updated.

Course Reading

Required Textbook:

- Levine, et al. 2008. *Statistics for Managers Using Microsoft Excel*, 5th Edition. Pearson.

Selected chapters from:

- Huff, Darrell. 1954. *How to Lie With Statistics*. New York, W.W. Norton and Company.
- Dwedney, A.K. 1993. *200% of Nothing*. Wylie.

Articles:

- Delucchi, Michael. 1993. "Academic Performance in a College Town." *Education* 114: 96-100.

Assessment

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

Attendance / Participation (see rubric): 10%

Homework / In-class exercises / Quizzes: 25%

Exam 1: 15%

Exam 2: 15%

Exam 3: 15%

Final Exam: 20%

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. These homework assignments are required, but usually only one question from the homework assignment will be randomly or non-randomly selected for grading. Therefore even though your entire assignment is not graded, it is in your best interest to have completely finished and understood the assignment by the due date.

There will be many unannounced (pop) quizzes given throughout the semester. 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. Sometimes in-class exercises will be given, some of which must be done in small groups. Assessment of in-class exercises and quizzes are treated identically towards the final grade.

Exams

There will be three midterm exams and one cumulative final exam. All exams will be take-home exams, and you will be given one week to complete them. Each exam is worth 20% of final course grade. The *take-home exams must be done independently, without assistance from any other person*, whether they are in this class or not. Failure to comply with this restriction will be considered academic dishonesty, and I will pursue the harshest penalty the University will allow. You may use your notes and textbook for the take-home final.

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 and provide verifiable documentation within two business days after the absence*. If your documentation is successfully verified by someone with appropriate authority, you will be allowed to make up missed work.

If you need to miss a class due to a University approved extra-curricular activity, and your coach or faculty/staff representative indicates it is absolutely necessary for you to miss class, you must notify your instructor before the absence, provide appropriate documentation, and arrange to complete any missed quizzes, homework, or exams *before the absence*, unless the instructor suggests alternative arrangements. Moreover, if you miss class for any reason, it is your responsibility to figure out and understand the material you missed. One-on-one help outside is intended as a supplement, not a replacement, of class discussion.

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 (the harshest penalty likely involves failure of the course, and possibly expulsion from the school).

Students should be aware that turning in the same written work for two different classes is plagiarism, even if you are the author of the work. Collaborating, receiving help, or helping others on the take home exams is also cheating. Both of these forms of academic dishonesty are very serious offenses.

Table 1: Class Participation Rubric

Criteria	Above Average	Average	Below Average
Attendance / Promptness	Learner promptly attends at least all but three classes.	Learner is late and/or misses between eight and four classes .	Learner is late and/or misses more than eight 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 three and six classes not offering any ideas or answering any questions.	Learner will go through more than six 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, with the exception of at most three classes.	Student demonstrates she/he is not prepared with assignments and reading for between four and eight classes.	Student demonstrates she/he is not prepared with assignments and reading for more than eight 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. The class website has a regularly updated calendar at <http://www.murraylax.org/m230/spring2009/calendar.html>

Week 1: January 12 - 16

- *Topics:* Meet and greet, discuss syllabus, frequency distributions, measures of center.
 - *Required reading:*
 - Frequency distributions: Levine et al, Section 2-3.
 - Measures of center: Levine et al, Section 3-1, 3-3.
 - Huff, Chapter 1, “The Sample With Built-in Bias”
 - Huff, Chapter 2, “The Well Chosen Average”
 - *Recommended Reading:*
 - Dwedney, Chapter 3, “The Mathematics of Advertising”
 - *Start homework:*
 - Thursday, January 15
 - Histograms - Section 2-3: problems 2.22, 2.23 (use a computer or by hand).
 - Means and medians - Section 3-3, problems 3.1 through 3.4 (see class notes for more details).
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Week 2: January 19 - 23

- *Homework due:* Tuesday, January 20 - HW on means and medians.
 - *Topics:* Measures of variation, skewness, and correlation.
 - *Required reading:*
 - Variation: Levine et al, Sections 3-2, 3-3.
 - Scatter plots and correlation: Levine et al, Sections 2-5, 3-5.
 - *Start homework:*
 - Thursday, January 22
 - Variance and correlation: Section 3-3, problems 3.1 through 3.4 (all parts), 3.8.
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Week 3: January 26 - 30

- *Homework due:* Tuesday, January 27 - HW on variance and correlation.
- *Topics:* Introduction to probability, probability distributions.
- *Required reading:*
 - Intro to probability: Levine et al, Sections 4-1, 4-2.
 - Probability distributions: Levine et al, Sections 5-1, 5-2.
- *Start homework:*

- Thursday, January 29
 - Probability: Section 4-1, problems 4.3 through 4.10.
 - Conditional probability: Section 4-2 problems 4.16 through 4.24.
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Week 4: February 2 - 6

- *Homework due:* Tuesday, February 3 - HW on Probability.
 - *Topics:* Probability distributions, normal distribution.
 - *Required reading:*
 - Probability distributions: Levine et al, Sections 5-1, 5-2.
 - Normal distribution: Levine et al, Sections 6-2, 6-3.
 - *Start homework:*
 - Thursday, February 5
 - Combining random variables: Section 5-2 problems 5.7 through 5.11.
 - Normal distribution: Section 6-2, problems 6.1, 6.3, 6.5, 6.6, 6.11.
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Week 5: February 9 - 13

- *Homework due:* Tuesday, February 10 - HW on normal distribution.
 - *Topics:* Sampling distribution / Central limit theorem.
 - *Required reading:* Levine et al, Sections 7-3, 7-4, 7-5.
 - **Begin Take Home Exam 1**, to be handed out Friday, February 13.
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Week 6: February 16 - 20

- **Take Home Exam 1 - Due Friday, February 20**
 - *Topics:* Central Limit Theorem continued, Hypothesis testing about means (pop. variance known).
 - *Required reading:*
 - Central Limit Theorem: Levine et al, Sections 7-4, 7-5.
 - Hypothesis testing about means: Section 9-2, 9-3.
 - *Start homework:*
 - Thursday, February 19
 - Hypothesis testing about means: Section 9-3, problems 9.44 through 9.47.
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Week 7: February 23 - 27

- *Homework due:* Tuesday, February 24 - Homework on hypothesis testing about means.
- *Topics:*
 - Hypothesis testing about means (pop. variance unknown)
 - Hypothesis testing about proportions.

- *Required reading:*
 - Hypothesis testing about means: Levine et al, Section 9-4.
 - Proportions: Levine et al, Section 9-5.
 - Proportions: Dwedney, Chapter 2, “Statistics and Damned Lies”
- *Start homework:*
 - Thursday, February 26
 - Hypothesis testing about means: Section 9-5 problems 9.48 through 9.55.
 - Proportions: Section 9-5, problems 9.66 through 9.67.

Spring Break: Monday, March 2 through Friday, March 6

Week 8: March 9 - 13

- *Homework due:* Tuesday, March 10 - HW on hypothesis testing about means and proportions.
- *Topics:* Confidence Intervals about means (with pop. variance known/unknown) and proportions.
- *Required reading:* Levine et al, Sections 8-1 through 8-3.
- *Start homework:*
 - Thursday, March 12
 - Section 8-1, problems 8.1 through 8.8.
 - Section 8-2, problems 8.27, 8.28.
 - Section 8-3, problems 8.26, 8.27.

Week 9: March 16 - 20

- *Homework due:* Tuesday, March 17 - HW on Confidence intervals.
- *Topics:* Inferences on differences in means.
- *Required reading:* Levine et al, Sections 10-1, 10-2.
- *Start homework:*
 - Thursday, March 19
 - Section 10-1, problems 10.7, 10.8, 10.9.
- **Begin Take Home Exam 2**, to be handed out Friday, March 20.

Week 10: March 23 - 27

- **Take Home Exam 2 - Due Friday, March 27**
- *Homework due:* Tuesday, March 14 - HW on differences in means.
- *Topics:* Chi-squared tests of independence.
- *Required reading:*
 - Levine et al - Section 12-3.
 - Huff - Chapter 8, “Post-hoc Rides Again”.

- *Start homework:*
 - Thursday, March 26.
 - Section 12-3, problems 12.20, 12.21, 12.24.
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Week 11: March 30 - April 3

- *Homework due:* Tuesday, March 31 - HW on chi-squared tests.
 - *Topics:* Correlation and Simple linear regression.
 - *Required reading:* Levine et al - Sections 13-2, 13-7.
 - *Start homework:* Regression analysis
 - Thursday, March 26.
 - Section 13-2, problems 13.1, 13.2, 13.3, 13.8.
 - Section 13-7, problems 13.40, 13.43, 13.37
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Week 12: April 6 - 10

- *Homework due:* Tuesday, April 7 - HW on linear regression.
 - *Topics:* Multiple regression, variance decomposition.
 - *Required reading:*
 - Levine et al - Sections 13-3, 14-2, 14-3.
 - **Thursday, April 9 - Easter break, no classes.**
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Week 13: April 13 - 17

- *Homework due:* Tuesday, April 7 - HW on linear regression.
 - *Topics:* Multiple regression, variance decomposition.
 - *Required reading:*
 - Levine et al - Sections 13-3, 14-1, 14-2, 14-3.
 - Delucchi, Michael. 1993. "Academic Performance in a College Town." *Education* 114: 96-100.
 - **Begin Take Home Exam 3**, to be handed out Friday, April 17.
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Week 14: April 20 - 24

- **Take Home Exam 3 - Due Friday, April 24**
 - *Topics:* Multiple regression, variance decomposition (continued).
 - *Start Homework:* Multiple regression analysis.
 - Thursday, April 23.
 - Section 14-2, problems 14.4, 14.5.
 - Section 14-3, problems 14.13.
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Week 15: April 27 - May 1

- *Homework due:* Tuesday, April 28 - HW on multiple regression.
- **Start Take Home Final Exam - Tuesday, April 28.**
- Catch-up time.

Final Exam Due Tuesday, May 5 at 12pm
