Applied Statistics (MATH 206)

Winter Quarter, 2006

Time/Place: MWF 11:00-11:50 p.m. KRH 347
R 2:00-4:50 p.m. KRH 215

Instructor: Jonathan Duncan (duncjo@wwc.edu)
Office: Kretchmar Hall 330, phone: 527-2097
Office Hours: 10:00 MTWF, 11:00 R, 1:00 W, or by appointment


Calculator: You will need a **simple** scientific calculator.
Webpage: http://math.wwc.edu/courses/206/

This course provides a study of applied statistics, including methods of describing data, distributions, sampling, confidence intervals, hypothesis testing including analysis of variance, correlation and regression. We will cover selected sections from chapters 1-11 in your text. The deadline for withdrawing is **Tuesday, 21 February** and the final will be given on **Monday, 13 March**.

### Topics

1. Describing, Exploring and Comparing Data (Chapters 1 and 2):
   - types of data, critical thinking, design of experiments, frequency distributions, visualizing data, measures of center, measures of variation, measures of relative standing, exploratory data analysis
2. Probability and Probability Distributions (Chapters 3 and 4):
   - fundamentals of probability, addition rule, multiplication rules, counting, random variables, binomial probability distributions, mean and variance of the binomial distribution
3. Normal Probability Distributions (Chapter 5):
   - standard normal distribution, applications of the normal distribution, sampling distribution, central limit theorem, normal approximation to the binomial distribution
4. Estimates and Hypothesis Testing (Chapters 6, 7, and 8):
   - estimating a population proportion, estimating a mean with known $\sigma$, estimating a mean with unknown $\sigma$, basic hypothesis testing, testing a proportion, testing a mean with known $\sigma$, testing a mean with unknown $\sigma$, inferences about two means
5. Correlation, Regression, Goodness-of-Fit and ANOVA (Chapters 9, 10, and 11)
   - correlation, regression, multinomial experiments: goodness-of-fit, one-way analysis of variance

### Objectives

Upon completion of this course, students will have

1. developed demonstrable understanding of the topics outlined above;
2. successfully engaged in mathematical thinking, reasoning, problem solving, and expression;
3. developed the ability to perform statistical tasks using modern computer applications.

The following requirements encourage and measure the successful completion of these objectives.

### Online Quizzes and Homework Forum Participation (O1.O2)

Online quizzes will be given after lab on Thursdays, excluding those weeks in which an exam is scheduled. Seven quizzes will be given totaling 70 points. In addition, regular participation in the online homework forum is worth up to 40 points. You may earn a combined total of no more than 90 points in this category.
Homework (O2)

Mathematics is not a spectator sport. Daily assignments will be given, each due by 5:00 p.m. on the
day of the next class period. These assignments should be considered the minimal amount of homework
required to pass the course. Assignments which are more than one class day late will not be accepted. Your
lowest two homework scores will be dropped at the end of the quarter.

Please observe the following guidelines to ensure that your homework assignments are accepted:

1. Use letter (8.5 × 11) sized paper with clean edges (not torn out of a notebook).
2. Assignments must be stapled or paper-clipped and folded lengthwise like a book. Write your name,
   the course number, and assignment number(s) on the front cover.
3. Use a pencil, write legibly, and organize your problems and solutions in a logical manner. Show all
   steps in solving the problem, including figures and notes if appropriate.

Lab Activities (O3)

Weekly labs will focus on statistics applications using technology. You will work in pairs to complete the lab
activities and submit individual lab reports by 5:00 p.m. on the Monday following each lab session. A lab
exam will be given during the lab session in the final week of the quarter.

Exams (O1,O2)

There will be three exams during the quarter, including the two-hour comprehensive final. The first two
exam dates are subject to in-class change, to be announced at least one week in advance. You may request
alternative exam dates in advance for appropriate and verifiable reasons. The final exam (80% written,
20% lab) may only be taken out of schedule after consultation with the Associate Academic Dean.

Exam I Chapters 1 through 4 27 January
Exam II Chapters 5 through 7 24 February
Final Cumulative, emphasis on chapters 8-11 Mon, 13 March 2:00 p.m.

Grades

Your final letter grade is based on your quarter average, made up of six scores: your online activity score,
your homework average, your lab report average, and your three exam scores. Weights are given below.
Appropriate (to your instructor) modifications of the final grade may be made in individual cases for progress,
unusual circumstances, etc.

<table>
<thead>
<tr>
<th>Score Weights</th>
<th>Letter Grades (lowest percent)</th>
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<tbody>
<tr>
<td>Final 25%</td>
<td>B+ 89%  C+ 78%  D+ 64%</td>
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<tr>
<td>Exams I,II 2×20%</td>
<td>A 93%  B 82%  C 68%  D 57%  F 0%</td>
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<tr>
<td>Lab Reports 15%</td>
<td>A- 91%  B- 80%  C- 66%  D- 55%</td>
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<tr>
<td>Homework 12%</td>
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<td>Online 8%</td>
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All acts of dishonesty are unacceptable, including cheating, plagiarism, forgery, misrepresentation, falsifica-
tion, and prohibited collaboration. Violation of academic integrity codes will result in disciplinary action.
Collaboration on homework is encouraged, but be certain that the work you hand in is your own.

Disabilities

Students with a physical and/or learning disability who require accommodations should contact the instructor
or Disability Support Services at 527-2366. This syllabus is available in alternative formats upon request.