

Math 214: Statistical Methods

Winter 2008

Class Meets: MWF 9:00–10:05

Instructor: Neil Martinsen-Burrell (Science Center 363,
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Class Web Page: <http://mcsp.wartburg.edu/nmb/math214>

Office Hours: MW 1:15–2:15, T 9:30–10:30, F 10:45–11:45

Prerequisites: MA 90 competency

Text: Sullivan, *Statistics: Informed Decisions Using Data*, 2nd Edition, Prentice Hall.

Course Description: Basic terminology, concepts and techniques for describing data and inferring properties of populations (large groups) by using samples (small groups) from those populations.

Objectives: Upon completion of this course, students should be able to

1. Understand and explain simple statistical methods commonly used in reporting polling data and scientific research studies using correct statistical notation and appropriate language.
2. Construct informative graphical and numerical summaries of data appropriate for the type of data and the context in which the data was collected.
3. Interpret the meaning of graphical and numerical summaries of data in written terms appropriate to the context in which the data was collected.
4. Recognize and properly carry out parameter estimation (including confidence interval calculations) and hypothesis testing procedures by hand, with the aid of a statistical calculator, or using a statistical software program. Understand the formalism of parameter estimation and hypothesis testing and how it relates to, supports, and advances the scientific method.

5. Properly apply the formalism of parameter estimation and hypothesis testing to scientific inquiry by appropriate statistical analysis of collected data.
6. Understand the limitations of the statistical methodology learned in the course, and be able to recognize problems in which the statistical methods learned are not appropriate.

Computing: Computers are an important tool for doing statistics. You will be expected to use technology on homework assignments and on exams. We will use a program called MINITAB which is available for use in the computer lab in the basement of the Science Center (SC 043). A TI-83/84 graphing calculator will also be *very* useful for many of the concepts we will discuss. If you have such a calculator, you should bring it to class. If you don't have such a calculator, you should consider borrowing or buying one.

Homework: Working problems is an important part of the process of learning this material—just coming to class is not enough! Homework will be assigned for each class meeting and collected weekly on Mondays.

I encourage you to try each day's homework before coming to class. In conjunction with the reading that you will be doing before class (see Writing About Reading below) this will allow you to ask questions that will help *you* learn what *you* find difficult. And remember, if you have a question on some material, so do other people!

Collaboration is an important mathematical skill, particularly in statistics where work often crosses disciplinary lines, so collaboration on homework is allowed and encouraged. **But** copying from another person is prohibited in accordance with the Honor Code (see below). Think of your classmates as reference materials for your homework, and remember to cite your references: "I consulted Daffy Duck on the above problem."

Writing About Reading: Learning outside of class time is the most important way for you to learn this material. To develop your communication skills and ensure that you are reading the material before class, there will be a *short* writing question posted on the Manhattan system (socrates.wartburg.edu) about each class period's readings. You must complete the assignment before the start of class to get credit. These assignments will not be graded, only checked to see that you did them.

Projects: Learning to communicate mathematical ideas is an important part of learning mathematics. During the semester you will work on 4 or 5 small projects in groups, each one culminating in a written report. These projects are intended to help you learn mathematical communication skills.

Exams: There will be three midterm exams in class (**February 1, February 22 and March 28**) and one cumulative final exam (**Wednesday, April 16, 11:30 am**). As described below, each midterm accounts for 10% of your grade and the final for 15%.

Grading:

Homework	25%
Writing About Reading	10%
Projects	20%
Midterms	30%
Final	15%

Grading will be relative to the performance of the rest of the class, with the limitation that a 90% will guarantee you at least an A-, 80% a B-, 70% a C- and 60% a D.

Academic Honesty: By attending Wartburg College, students pledge their dedication to the Honor Code.

As a matter of personal commitment, students, faculty, and staff of Wartburg College are expected to demonstrate four simple principles.

1. All submitted work must be your own.
2. When using the work or ideas of others, including fellow students, provide full credit through accurate citations.
3. Ask for clarification if there is uncertainty about citation rules on a particular assignment.
4. Maintain academic honesty on examinations and class assignments.

Academic dishonesty will result in consequences between a failing grade for that assignment and a failing grade for the course.

Special Needs: The Americans with Disabilities Act of 1990 (ADA) provides protection from illegal discrimination for qualified individuals with disabilities. Students requesting instructional accommodations due to disabilities must arrange for such accommodations by contacting Pathways Associate for Testing and Advising Carla Coates. She can be reached at the Pathways Center, 314 Vogel Library, Wartburg College, Waverly, IA 50677, 352-8230, Carla.coates@wartburg.edu. Presenting documentation of a student's disability early (before the beginning of classes) is helpful and often necessary to secure needed materials in a timely way. Accommodations should be requested *prior* to affected assignment due dates. For more detailed information, please see <http://www.wartburg.edu/pathways/testing/AccomodationProcessStudents.pdf>