

Statistical Methods and Computing – 22S:30/105 (STAT:2010)
Spring, 2014

1 General Information

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| Instructor: | Kate Cowles 374 SH 335-0727 kate-cowles@uiowa.edu |
| Office hours: | T 1:30 - 2:20 p.m. W 12:30 - 1:20 p.m. Th 1:30 - 2:20 p.m. Please feel free to make appointments to see me outside of office hours, and to send me questions by e-mail. |
| Department: DEO: | Statistics and Actuarial Science, 241 SH Dr. Luke Tierney, 241 SH, 335-0712 luke-tierney@uiowa.edu |
| Lectures: | M, W, F 10:30-11:20 140 SH |
| Lab: | Will replace 1 lecture every other week 41 SH |
| Web page: | http://www.stat.uiowa.edu/~kcowles/s30_2014 Handouts, homework assignments, datasets, etc. will be posted on the web page for you to download. |
| Textbook: | Moore and McCabe, <i>The Basic Practice of Statistics</i> , 6th ed. 2013, Freeman |
| Recommended resources: | Delwiche and Slaughter, <i>The Little SAS Book</i> , 4th ed., 2008 |

2 Course description

Methods of data description and analysis using SAS: descriptive statistics, graphical presentation, estimation, hypothesis testing, sample size, power; emphasis on learning statistical methods and concepts through hands-on experience with real data. GE: Quantitative or Formal Reasoning.

3 Course goals and objectives

Through hands-on experience with real data from a wide variety of applications, students will learn basic methods required for data analysis and interpretation. The emphasis will be on formulating questions, choosing appropriate statistical techniques for a given problem, verifying whether the assumptions behind the techniques are met by the dataset, drawing appropriate conclusions from the analysis, and communicating the results. Students will

learn the basics of SAS, a statistical software package that is widely used in business, industry, government, and research.

22S:2010 is approved for General Education in the Quantitative or Formal Reasoning category.

4 Expectations for attendance and student effort

- Students are expected to attend all lectures, labs, and student presentation sessions. Roll will be taken on approximately 5 randomly-selected dates during the semester. Please let me know if you have a family emergency and need to miss class. If you are ill, please use the form at <http://www.registrar.uiowa.edu/Student/FormsforStudents/tabid/79/Default.aspx> to report it.
- Students are expected to turn in all homework and project components by the deadlines. On average, students will need to spend about 2 hours outside of class for each one hour of class time. Some weeks will be lighter, others heavier.

5 Evaluation of students

5.1 Homework

In general, homework will be assigned each Fri. and will be due in class the following Fri. Exceptions to this schedule will be announced in class.

Show your work when solving written homework problems. For computer problems, turn in printouts of your commands or programs and their output.

You are encouraged to study with others. However, if you do work with others on homework assignments, please: a) write up your own assignment and make sure you completely understand all solutions that you submit, and b) write the names of the others in your study group on your assignment.

Late homework is accepted only as required by university policy, i.e. due to “illness, mandatory religious obligations, or other unavoidable circumstances or University activities.” Documentation must be provided.

5.2 Exams

There will be three 1-hour midterm exams and one comprehensive 2-hour final. The midterms will be given in the classroom during a regular lecture period. Students may bring one 8-1/2 x 11 in. sheet of paper with notes to each midterm, and may bring three sheets to the final exam.

Midterm 1 week of 2/24
Midterm 2 week of 3/24
Midterm 3 week of 4/28
Final exam TBA

Missed exams may be made up only with documentation of reasons required by university policy (see “Late Homework” above).

5.3 Projects

Students will work in groups of three to carry out projects involving application of the statistical methods covered in the course to problems of their own choosing. I will be happy to work with you at each stage of your project. Each group of students will:

- Formulate a research question
- Obtain a dataset that can be used to address this question; you may
 - collect your own data,
 - obtain a dataset from the web, from a book, from an instructor in your major field, or from some other source, or
 - see us for a choice of datasets
- determine an appropriate method of analysis
- use SAS to check the data
- use SAS to carry out the analysis
- report and interpret the results

I will expect more sophisticated projects from graduate students and other students registered for 22S:105.

Projects will be carried out in three phases. Please meet with either one of us at least once while you are working on each phase.

- Project proposal (due 4/07) This is a detailed description of what you plan to do, including question(s) to be addressed, dataset to be used, methods to be applied. Also specify your intended method of presentation for the final project. (See below.)
- Project interim report (due 4/21) This informal report will indicate that your project is “on track.” All computing should be done. Turn in code and output, and a brief summary (hand-written is O.K.) of what the results mean and what remains to be done.

In addition, include an itemized list of what specific tasks each member of the project team has done to date on the project.

- Project presentation (must be posted or submitted by 05/05)
Projects must be finalized in a form that can be shared with the entire class, such as:
 - posting a document on the course web page
 - preparing a poster
 - giving an oral presentation with overheads, slides, or computer images

Posters and oral presentations will be given in class during the week of 05/05. We will read the documents posted on the course web page in lab on Wed, 5/07.

Along with the final project, the team must turn in an itemized list of each person’s contributions to the project.

5.4 Grading

The course components will be weighted as follows:

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| Homework | 10% |
| Midterms | 42% (14% each) |
| Project | 20% |
| Final | 28% |

6 Extra Help

The Statistics Tutorial Lab, located in 202 CC, gives free tutorial assistance to students in 22S:2, 8, 25, and 39. In addition, several graduate students have volunteered to independently tutor students in various 22S: courses at mutually- arranged times and fees. Please check the web site www.stat.uiowa.edu/courses/tutoring.html for tutoring details.

7 College of Liberal Arts and Sciences: Policies and Procedures

7.1 Administrative Home of the Course

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed in 120 Schaeffer Hall or see the CLAS Student Academic Handbook: www.clas.uiowa.edu/students/academic_handbook/index.shtml

7.2 Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences. (Operations Manual, III.15.2. Scroll down to k.11.)

7.3 Accommodations for Disabilities

A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

7.4 Academic Honesty

All CLAS students have, in essence, agreed to the College's Code of Academic Honesty: "I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled (CLAS Academic Policies Handbook).

7.5 CLAS Final Examination Policies

The date and time of every final examination is announced during the fifth week of the semester; each CLAS student will receive an email from the Registrar stating the dates and times of the student's final exams. Final exams are offered only during the official final examination period. No exams of any kind are allowed during the last week of classes. All students should plan on being at the UI through the final examination period.

7.6 Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS Academic Policies Handbook).

7.7 Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment at

www.uiowa.edu/~eod/policies/sexual-harassment-guide/index.html for assistance, definitions, and the full University policy.

7.8 Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Public Safety web site.

7.9 Missed Exam Policy

University policy requires that students be permitted to make up examinations missed because of illness, mandatory religious obligations, certain University activities, or unavoidable circumstances. Excused absence forms are required and are available on the Registrar web site. www.registrar.uiowa.edu/forms/absence.pdf

8 Course schedule

This approximate schedule will be updated as needed during the semester.

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| 1/22 - 1/24 | Chapter 1, 2 |
| 1/27 - 1/31 | Chapter 3 lab 1/31 |
| 2/03 - 2/07 | Chapter 4, 5 lab 2/07 |
| 2/10 - 2/14 | Chapter 5, 8 |
| 2/17 - 2/21 | Chapter 9 lab 2/21 |
| 2/24 - 2/28 | Chapter 10-11 midterm 1 |
| 3/03 - 3/07 | Chapter 14, 15 lab 3/07 |
| 3/10 - 3/14 | Chapter 15, 16 |
| 3/17 - 3/21 | Spring Break |

3/24 - 3/28 Chapter 16, 18
lab 3/28
midterm 2
3/31 - 4/04 Chapter 18
4/07 - 4/11 Chapter 19, 20
Project proposals due 4/07
lab 4/11
4/14 - 4/18 Chapters 20, 21, 23
4/21 - 4/25 Chapters 23, 25
Project interim reports due 4/21
lab 4/25
4/28 - 5/02 Chapter 24
midterm 3
5/07 - 5/11 project presentations
Projects due 5/11
lab 5/09
Exam week Final exam