

22S:158 (STAT:3210) Experimental Design and Analysis
22S:165 (STAT:5201) Applied Statistics II

Spring semester, 2011

Time & Place	Monday, Wednesday, Friday 9:30 am–10:20 am, 15 Schaeffer Hall
Prerequisites	22S:158: 22S:30 and 22S:152 22S:164: 22S:164 or equivalent
Text materials	Lenth, R. V. (1994), <i>Design, Data, and Deduction: An Introduction to Experimental Design</i> , self-published notes available for download on the course website. Oehlert, G. W. (2000), <i>A First Course in Design and Analysis of Experiments</i> , New York: W. H. Freeman and Company. <i>Note:</i> This book is out of print, but used copies may be available online. It is also available as a free download via http://www.stat.umn.edu/~gary/Book.html © 2010 under the Creative Commons license. (I recommend getting it printed and spiral-bound! If you take it to a copy shop, also take a printout of the above webpage—the language that says you may print it, etc.)
Class Web page	http://www.stat.uiowa.edu/~rlenth/Design/ (Some materials on this page are password-protected. You will receive the login information in lecture.) Grades will be posted on ICON: http://icon.uiowa.edu/
Instructor	Russell V. Lenth — 271 Schaeffer Hall — 335-0814 — russell-lenth@stat.uiowa.edu
Office Hours	Monday and Wednesday 10:30–11:30, Thursday 2:00–3:00 pm; and by appointment
Statistics office	DEO: Professor Dale Zimmerman — 241 Schaeffer Hall — 335-0712

Course Goals

The main lesson to be learned in this course is that **how you collect data** matters a lot; and that in turn dictates how data should be analyzed. Often, a good design leads to a very simple analysis.

Topics

The course website provides a schedule of topics to be covered. The earlier part of the course emphasizes intuitive ideas in experimental design, based on the Lenth notes (*DDD* for short), Chapters 1, 2, 3.1, 4, and 5. The later part of the course goes into more detail in modeling and analysis, and covers much of the Oehlert book, but omitting parts of Chapter 10 and Chapters 14, 15, and 18 through 20.

Course work

There will be weekly assignments, three regular exams (each on about 1/3 of the course topics), and a comprehensive final exam. The dates of these exams are given in the section on grading. *Deviations from the scheduled final time will only be made in accordance with University policies. If you fly home early, you will get a zero on the Final.*

Some of the homework will be mini-project-like in that you will have to design experiments and collect the data using simulation software.

Some homework problems and exam questions may be designated only for students in 22S:165 or only for students in 22S:158.

Working with another student on homework is OK; however, you must (1) write your homework papers independently, and (2) write the name(s) of your study partner(s) on your homework papers.

Grading

Grading elements are weighted as follows:

Exam 1	Wed, Feb 16	20%
Exam 2	Wed, Mar 30	20%
Exam 3	Wed, Apr 27	20%
Final exam	Wed, May 11 (12:00 noon–2:00 pm)	25%
Homework	Weekly	15%

The basic cutoffs between whole-letter grades are at 90, 80, 70, . . . , and the determination of minus, unmodified, or plus is based on the ones digit being in the sets $\{0, 1, 2\}$, $\{3, 4, 5, 6\}$, and $\{7, 8, 9\}$. For example, the *A*– range is 90.00–92.99, and the *B* range is 83.00–86.99.

For students enrolled in 22S:158, I will add 2.5 points to their course averages before applying these cutoffs.

Grading standards

Running programs is not the same thing as doing a complete data analysis. Thus, **you will get little or no homework credit for just submitting computer output without a written interpretation** that actually addresses the question asked in the problem.

You will also get **reduced credit for sloppy presentation** of results, because good statistical analysis requires good communication of its findings. One type of sloppy presentation is inappropriate choice of fonts for computer output:

Points off (proportional font)

Analysis of Variance Table

Response: Fertility

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Agriculture	1	894.84	894.84	17.4288	0.0001515 ***
Examination	1	2210.38	2210.38	43.0516	6.885e-08 ***
Education	1	891.81	891.81	17.3699	0.0001549 ***
Catholic	1	667.13	667.13	12.9937	0.0008387 ***
Infant.Mortality	1	408.75	408.75	7.9612	0.0073357 **
Residuals	41	2105.04	51.34		

Acceptable (monospace font, e.g. Courier)

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Finally, you should *show* the computer code you used, but *omit* sections of computer output that are not really needed to answer the question at hand.

Late work and absences

Barring illness or family emergencies, late work is not accepted. In the event of such an emergency or illness, you must notify me as soon as possible—within 24 hours. If you miss class, try to obtain notes from other students. Most handouts will be available from the website; but lecture notes will not. If there is a pattern of excessive absences from the lecture, I will warn you; if the pattern continues, I will drop you from the course.

Computer software

We will use SAS as the primary tool for data analysis. Web-based Java applets provided by the instructor will be used for simulations and sample-size determination.

Administrative policies

The following policy and procedural statements have been summarized from the web pages of the College of Liberal Arts and Sciences, <http://www.clas.uiowa.edu/>, and The University of Iowa Operations Manual, <http://www.uiowa.edu/~our/opmanual/index.html>.

Administrative Home 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 to 120 Schaeffer Hall, or see the CLAS Student Academic Handbook, <http://www.clas.uiowa.edu/students/handbook/>.

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: <http://www.uiowa.edu/~our/opmanual/iii/15.htm#152>. Scroll down to k.11.)

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 <http://www.uiowa.edu/~sds/> for more information.

Academic Fraud Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLAS Academic Fraud section of the Student Academic Handbook, <http://www.clas.uiowa.edu/students/handbook/x/#2>.

CLAS Final Examination Policies Final exams may be offered only during finals week. No exams of any kind are allowed during the last week of classes. Students should not ask their instructor to reschedule a final exam since the College does not permit rescheduling of a final exam once the semester has begun. Questions should be addressed to the Associate Dean for Undergraduate Programs and Curriculum.

Making a Suggestion or a Complaint Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook, <http://www.clas.uiowa.edu/students/handbook/x/#5>.

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

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, <http://police.uiowa.edu/stay-informed/emergency-communication/>.