

22S:2 (STAT:1010) Statistics and Society, Fall 2010

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Course Web Pages:	Start at http://www.stat.uiowa.edu/~jblang/s2 [username: xxxxxx password: xxxxxx]
Lecture:	12:30-1:20 MWF, 100 PH
Discussion:	T or R. See ISIS for your discussion section time and location
Instructor:	Joseph B. Lang, 207 SH , 335-3129, joseph-lang@uiowa.edu
Office Hours:	1:30-2:30 MW, 10:00-11:00 F, or by appointment
Pre-Requisites:	22M:001 (MATH:0100) or equivalent
Department, College:	Statistics and Actuarial Science , Liberal Arts and Sciences
DEO:	Dale Zimmerman, 241 SH, 335-0712, dale-zimmerman@uiowa.edu
Main Office:	241 Schaeffer Hall

Required Text	Description	Objectives	Organization
Pace	Guidelines	Grading	Miscellaneous

Required Text:

Bennett, J.O., Briggs, W.L., and Triola, M.F. 2009. *Statistical Reasoning for Everyday Life*, 3rd edition, Boston: Addison Wesley, Pearson Education, Inc. ISBN-13 978-0-321-28672-7.

Course Description*:

This is a course on statistical literacy, which is the ability to understand and critically evaluate statistical results that are encountered on a daily basis. This course will introduce the student to many basic statistical concepts including, variables, variability and predictability, distributions, probability, margin of error, and statistical significance. The student will learn how to create and interpret numerical and graphical descriptions of samples and populations. The logic of statistical inference and the related methods of statistical estimation and hypothesis testing will be covered as well. We will discuss how conclusions depend on study design, emphasizing the critically important difference between observational studies and designed experiments. Statistical fallacies and common abuses will be discussed; examples include: association does *not* imply causation, conditional vs. marginal relationships, confounding variables, poor sampling methods, data snooping and the law of truly large numbers, statistics as propaganda, graphical prevarication, statistical vs. practical significance, "file-drawer" bias, stereotyping, sophomore slump fallacy, prosecutor's fallacy, gambler's fallacy, etc. Instead of memorizing formulae and lists of bulleted items, we will spend our time learning about the important concepts and the logic of

quantitative argument.

*This course is approved for the [general education](#) quantitative or formal reasoning requirement.

Course Objectives:

The successful student will leave this course with the ability to understand and critically evaluate statistical results that are encountered on a daily basis. The student will learn to appreciate the contribution that statistical reasoning makes in public and personal decisions. The student will learn to recognize statistical fallacies and abuses. More specific skills include the ability to identify study types and critique the corresponding conclusions, create and interpret simple graphics, compute appropriate numerical summaries, and apply a few basic inferential tools.

Course Organization:

Lectures/Discussion. We will meet three times a week (MWF 12:30-1:20) in Phillips Hall (100 PH) for lecture. One day a week, either T or R, you will meet in your designated discussion section. Lectures will primarily cover topics from Chapters 1-9 in the BBT textbook. You will occasionally work on group projects in lecture. You will work in groups and individually on worksheets in discussion. You will also look over homework and exams in discussion.

Homework Exercises. Most every week, homework assignments will be posted on the course web site and will be handed in right before class on the due date.

Class Notes. A student version of most lecture slides will be made available to you on the course web site (go to www.stat.uiowa.edu/~jblang/s2, not ICON). You are responsible for downloading the slides before class and bringing them with you so that your own notes can be added. Gaps in the slides will be filled in during the lectures. The slides use large font sizes, so you may want to print the slides two or even four to a page, using landscape orientation.

Course Website. The course website is located at www.stat.uiowa.edu/~jblang/s2, not ICON. Among other things, the website will include a calendar with reading assignments, homework assignments, worksheets, and a student version of lecture slides.

Exams. There will be two in-class midterm exams (Fri, Sep 24 and Fri, Oct 29) and a final exam (9:45am, Fri, Dec 17).

Course Pace (tentative):

Weeks	Concepts	Sections in BBT, etc.
1-3, Aug 23	Statistical Reasoning: An Overture	1.1, Overture handout
4, Sept 13	Sampling, Observational Studies vs. Designed Experiments	1.2, 1.3, [read 1.4]
5, Sep 20	Using Percentages, Index Numbers, Graphical Displays of Data	2.3-2.4, 3.1-3.4
Exam #1, Fri Sep 24		
6, Sep 27	Graphical Displays of Data, Numerical Descriptions	3.1-3.4, 4.1-4.3, skip 4.4 for now
7, Oct 4	Normal Distribution, Computing with Normal Curves, Empirical Rule	5.1-5.2, skip 5.3 for now
8, Oct 11	Correlation (especially interpretation), Straight-Line Regression	7.1-7.3
9, Oct 18	Straight-Line Regression and Prediction, Search for Causality	7.3-7.4
10, Oct 25	Statistical Significance, Random Variables, Probability Distributions, Expectations (aka Probability Means)	6.1, <i>handout</i>
Exam #2, Fri Oct 29		
11, Nov 1	Sampling Distributions, Central Limit Theorem, Statistical Estimation	8.1, 5.3, 8.2-8.3, Overture <i>handout</i>
12-13 Nov 8	Statistical Estimation and Statistical Tests	8.2-8.3, 9.1-9.3, 10.1, Overture <i>handout</i>
-- Nov 22	No Class--Thanksgiving Day Holiday	No Class
14, Nov 29	Statistical Tests, Statistical Fallacies, Paradoxes, and Abuses	9.1-9.3, 10.1, 1.4, 4.4, 7.2, 7.4, <i>handout</i>
15, Dec 6	Statistical Fallacies, Paradoxes, and Abuses	1.4, 4.4, 7.2, 7.4, <i>handout</i>
Final Exam, 9:45am, Fri Dec 17		

Course-Specific Guidelines and Policies:

Reading Ahead. It is very important that you read ahead. It will be difficult to get much out of lecture if the material is completely new to you.

Effort Expectations. My effort expectations align with the guideline adopted by the college of LAS. For a 3 s.h. course, you should expect to spend about 5-6 hours per week preparing for class sessions and doing homework. Of course, the '5-6 hours per week' is an average taken over the 15-week session. It is also an average taken over a diverse collection of students and courses. Thus, effort amounts will vary. It is fair to say, however, that the more effort you put in, the more you will get out of the course.

Participation, Attendance, and Point-Earning Opportunities. Students are expected to attend, and participate in, both lecture and discussion. You will be asked many questions, and you will be strongly encouraged to ask lots of questions. If you miss a class, you run the risk of missing a point-earning opportunity, which cannot be made-up. Point-earning opportunities will be in the form of in-class worksheet exercises, minute papers, and attendance checks.

Working Together. Unless instructed otherwise, you may work together on the homework problems. However, you must write up your own solutions *in your own words*. If you are personally asked to please write up your own solutions and subsequently turn in material that is obviously in the same words as a fellow student, the work will be considered to be plagiarized. Plagiarism will be dealt with according to the policies of the College of Liberal Arts and Sciences and the University (see additional information at the end of this syllabus).

Exams. The exams will all be closed-book. The exams will include multiple-choice and true-false items. You will be allowed to use one (two-sided) crib sheet for the exams. Bring along a calculator and #2 pencils.

Note: No cell phones will be allowed outside your bag/backpack in the examination room. If we see a cell phone, it will be collected and placed on the floor near the door.

Homework. Unless otherwise instructed, full credit on homework is possible only if it is handed in before class on the due date, is stapled, and includes the following information: your name, your teaching assistant's (TA's) name, and your discussion section number. Late homework, which should be handed in to your TA, has a discrete half-life of 24 hours (excluding weekend hours); that is, you get 50% credit if it is handed in late, but within 24 hours of the due time; you get 25% credit for the next 24 hours, etc.

Grading Questions. Questions about grading must be asked within one week of the graded work's return.

Electronic Etiquette. While in the classroom, you will not be allowed to send or check text messages, send or check email, browse the web, or use a cell phone. Social networking of any kind is not allowed. Please keep cell phones in your bag/backpack. If your cell phone is visible, it will be taken from you and placed in the front of class until the period has ended.

Grading and Components for Evaluation

Your final score S will be computed as $S = 0.20M_1 + 0.25M_2 + 0.25F + 0.25H + 0.05P$, where M_1 = percent correct on the first midterm exam, M_2 = percent correct on the second midterm exam, F = percent correct on the final, H = percent correct on homework and P = participation score on a 0-100 scale. Your

P score will be made up of point-earning opportunities, which will be in the form of in-class worksheet exercises, minute papers, and attendance checks.

Letter grades, including +'s and -'s, will be awarded according to a 90-80-70-60 schedule; e.g. if $S \geq 90$ then a grade of A- or better will be awarded. These are guaranteed cutoffs, so it is possible, but unlikely, that everyone receives an 'A.' I do, however, reserve the right to lower (but not raise) the cutoffs. Note that with this grading scheme you are not "graded on a curve," so you are not competing with fellow students. Therefore, you are not penalized for working together to better understand concepts.

Miscellaneous (Help and Policies)

Help outside of class:

- Your TA has regular office hours and can be contacted via email. I also have regular [office hours](#).
- Course web pages; start at <http://www.stat.uiowa.edu/~jblang/s2>.
- [Statistics Tutorial Lab](#), 202 CC.
- A list of tutors is maintained by the Department of Statistics and Actuarial Science at <http://www.stat.uiowa.edu/courses/tutors.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](#).

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.)

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.

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](#).

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](#).

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](#) 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](#).

*These CLAS policy and procedural statements have been summarized from the web pages of the [College of Liberal Arts and Sciences](#) and [The University of Iowa Operations Manual](#).

I hope you all have an enjoyable and successful semester.

This page was last updated:  (Joseph B. Lang)