

## STAT:1010 (22S:002) Statistics and Society, Fall 2012

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<b>Course Web Pages:</b>	Start at <a href="http://www.stat.uiowa.edu/~jblang/s2">http://www.stat.uiowa.edu/~jblang/s2</a> [ username: xxxxxx password: xxxxxx ]
<b>Lecture:</b>	12:30-1:20 MWF <a href="#">100 Phillips Hall</a>
<b>Discussion:</b>	T or R. See ISIS for your discussion section time and location
<b>Instructor:</b>	Professor Joseph B. Lang, <a href="#">207 SH</a> , 335-3129, <a href="mailto:joseph-lang@uiowa.edu">joseph-lang@uiowa.edu</a>
<b>Office Hours:</b>	10:00-11:30 M and W, or by appointment
<b>Pre-Requisites:</b>	MATH:0100 (22M:001) or equivalent
<b>Department, College:</b>	<a href="#">Statistics and Actuarial Science</a> , <a href="#">Liberal Arts and Sciences</a>
<b>DEO:</b>	Professor Luke Tierney, 241 SH, 335-0712, <a href="mailto:luke-tierney@uiowa.edu">luke-tierney@uiowa.edu</a>
<b>Main Office:</b>	241 Schaeffer Hall

<a href="#">Required Text</a>	<a href="#">Description</a>	<a href="#">Objectives</a>	<a href="#">Organization</a>
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### 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-equals-causation fallacy, switched-conditionals fallacy, stereotyping, gambler's fallacy, Sports Illustrated cover jinx (aka sophomore slump or regression fallacy), poor sampling methods, statistics as propaganda, graphical prevarication, statistical vs. practical significance, file-drawer bias, cyber-nooking bias, data snooping and the law of truly large numbers, 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 100 Phillips Hall. 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](http://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. Missing information 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](http://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 21 and Fri, Oct 26) and a final exam (TBA).

**Course Pace (tentative):**

Weeks	Concepts	Sections in BBT, etc.
1-3	Statistical Reasoning: An Overture	1.1, Overture handout
4	Sampling, Observational Studies vs. Designed Experiments	1.2, 1.3, [read 1.4]
5	Using Percentages, Index Numbers, Graphical Displays of Data	2.3-2.4, 3.1-3.4
<b>Exam #1, Fri Sep 21</b>		
6	Graphical Displays of Data, Numerical Descriptions	3.1-3.4, 4.1-4.3
7	Normal Distribution, Computing with Normal Curves, Empirical Rule	5.1-5.2
8	Correlation (especially interpretation), Straight-Line Regression	7.1-7.3
9	Straight-Line Regression and Prediction, Search for Causality	7.3-7.4
10	Statistical Significance, Random Variables, Probability Distributions, Expectations (aka Probability Means)	6.1, Prob handout
<b>Exam #2, Fri Oct 26</b>		
11	Sampling Distributions, Central Limit Theorem, Statistical Estimation	8.1, 5.3, CLT handout, 8.2-8.3
12-13	Statistical Estimation and Statistical Tests	8.2-8.3, 9.1-9.3, SE/ME handout, Confidence Intervals handout
14	Statistical Tests, Statistical Fallacies, Paradoxes, and Abuses	9.1-9.3, Statistical Testing handout, Paradox/Fallacy

		handouts
15	Statistical Fallacies, Paradoxes, and Abuses	Paradox/Fallacy handouts
<b>Final Exam, TBA</b>		

### 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 first exam, two for the second exam, and three for the final exam. Bring along a calculator, scratch paper, 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> .

## College of Liberal Arts and Sciences: Policies and Procedures

### 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/](http://www.uiowa.edu/~sds/) for more information.

### 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](#)).

### **CLAS Final Examination Policies**

The final examination schedule for each class is announced around the fifth week of the semester by the Registrar. 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. Once the Registrar has announced the dates and times of each final exam, the complete schedule will be published on the Registrar's web site.

### **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](#)).

### **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 [Department of Public Safety website](#).

\*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](#).

### **University Examination Policy**

**Final Examinations.** An undergraduate student who has two final examinations scheduled for the same period or more than three examinations scheduled for the same day may file a request for a change of schedule before the [published deadline](#) at the Registrar's Service Center, [17 Calvin Hall](#), 8-4:30 M-F, (384- 4300).

**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 at the Registrar web site: <http://www.registrar.uiowa.edu/forms/absence.pdf>

*I hope you all have an enjoyable and successful semester.*

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*This page was last updated:8/7/12 (Joseph B. Lang)*