The University of Iowa
College of Liberal Arts and Sciences
Department of Statistics and Actuarial Science
STAT:2020 (previously 22S:039)
Probability and Statistics for the Engineering and Physical Sciences
Fall 2014

Instructor:
Rhonda DeCook
211 Schaeffer Hall, 335-3249
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DEO: Dr. Luke Tierney, 241 Schaeffer Hall, 319-335-0712

Time and Location:
Lecture AAA: MWF 8:30-9:20 LR2 Van Allen Hall
Lecture BBB: MWF 3:30-4:20 LR2 Van Allen Hall

Course Goals and Objectives:
In this course we will develop probabilistic reasoning and statistical solutions for problems encountered in engineering and the physical sciences.

Course Website: http://www.stat.uiowa.edu/~rdecook/stat2020/stat2020.html

Instructor Office Hours (or by appointment):
Monday   9:45-11:15am   and   1:30-2:30pm
Tuesday   11am-noon
Wednesday   9:45-11:15am   and   1-2pm

Teaching Assistants:

Songtao Wan (A13, A14)	Dirk Hugen (A15, A16)	Bo Wang (B sections)
Email: songtao-wan@uiowa.edu	Email: dirk-hugen@uiowa.edu	Email: bo-wang-4@uiowa.edu
350 Schaeffer Hall, 353-2297	223 Schaeffer Hall, 353-2296	213 Schaeffer Hall, 335-2191

See course website for TA Office Hours.

Required Text:
Applied Statistics and Probability for Engineers. Sixth edition by Douglas
     C. Montgomery and George C. Runger.

Final Exam: Date and time to be determined.

Midterm 'Evening' Exams: Thursday, September 25, 6:30-8pm, W290 CB (exam 1)
                                                Thursday, November 6, 6:30-8pm, W290 CB (exam 2)

Topics Covered:

The collection, analysis, and display of information are discussed. Probability theory and statistics teach us how to characterize and model variability in processes and measurements. Probability theory, random variables, important discrete and continuous distributions, estimation of parameters and testing of hypotheses using sample data will be discussed. Regression methods will also be introduced. MINITAB, an interactive statistical computer package will be introduced and used.

Tentative Class Schedule:

Week	Topic	Chapter
1	Introduction, Sample Spaces and Event	1 & 2
2	Probability Rules, Counting Techniques, Conditional Probability	2
3	Independence, Random Variables, Discrete Random Variables	2 & 3
4	Common Discrete Distributions	3
5	Continuous Random Variables	4
	Exam 1: Thursday, Sept. 25, 6:30-8pm	
6	More on Continuous Random Variables	4
7	Joint Distributions	5
8	Correlation, Bivariate Normal, Numerical Summaries	5 & 6
9	Central Limit Theorem, Point Estimators	7
10	Confidence Intervals for μ and proportion p, t-distribution	8
11	Hypothesis testing for μ and p	9
	Exam 2: Thursday, Nov. 6, 6:30-8pm	
12	Inference for $\mu_1 - \mu_2$	10
13	Simple Linear Regression (SLR), Least-Squares Estimators	11
	–Thanksgiving Break–	
14	Hypothesis test in SLR, Correlation, Checking Assumptions	11
15	Multiple Linear Regression (if time permits)	12
16	**Final Exam: Date and Time TBD**	

Tentative days of no class:

Nov. 24-28, Thanksgiving Break

Compensation for night exams 1 & 2 (to be announced)

Tutorial Lab:

Extra help beyond office hours is available at the Statistics Tutorial Lab. See *http://www.stat.uiowa.edu/resources/tutoring* for links.

MINITAB Software:

Available in all Instructional Technology Centers (ITCs) such as 41 Schaeffer Hall. For a free on-line version, see *http://virtualdesktop.uiowa.edu*

Lecture/Reading:

Students should read material prior to lecture. We will *not* cover all sections of each chapter, so please focus your readings on the material that was covered in class. In the case of an absence, students are responsible for the material covered and must get the notes from a fellow student.

Quizzes may be given during lecture (or discussion). Quiz make-ups will not be given.

Similarities and Differences in AAA and BBB Lectures:

The lectures will essentially be the same. But YOU MUST ATTEND YOUR OWN LECTURE FOR QUIZZES (zero quiz points will be given if attending the wrong lecture).

Weekly Discussions:

Attendance at Discussion is important. Quizzes may be given during this time period, and worksheets for extra practice may also be used. Quiz make-ups will not be given.

Midterm Exams:

Two midterm exams will be given at times outside of the usual class time (see page 1).

Grading Policy:

Assessment in this course will be based on the following components:

- **Weekly Homework (10%)** - Every week, homework will be assigned and due approximately one week later. Due to time constraints, the grader may grade only some of the assigned questions, but you are responsible for understanding all questions. I will not accept late homework, but will instead throw-out your lowest homework score.

  Homework without a section number will receive a 5% deduction.

- **Scheduled Quizzes*** **(10%)** - Short quizzes may be given in two manners: 1) written quizzes in lecture and 2) written quizzes in discussion. There are no quiz make-ups, but I will instead throw-out your lowest scheduled quiz score.

  Prepare for these!!! They are over the most recent homework for which solutions are posted. No notes or 'crib sheets' will be allowed.

- **Unscheduled Quizzes*** **(5%)** - Again, short quizzes may be given in two manners: 1) written quizzes in lecture and 2) written quizzes in discussion. There are no quiz make-ups, but I will instead throw-out your lowest unscheduled quiz score.

- **MINITAB Projects (5%)** - Two projects will be assigned. They will give you experience with MINITAB software, and with reporting results of a statistical analysis.

- **Exams**[*] **(70%)** - There will be 2 midterm exams and a final exam:
  Midterms (20% each) given at the dates, times, and locations listed above.
  The Final (30%) time and location TBD.

> [*]No make-up exams or quizzes will be given unless there is an absence due to unavoidable circumstances as stated by University policy (documentation will be required in such a case). Missed exams and quizzes will receive a score of 0.
>
> BE SMART: Save your 'drop the lowest score' option for WHEN YOU REALLY NEED IT!! Your car breaks down, you're too tired to get out of bed, any unexcused absence (i.e. those kinds of absences that seem to be a legitimate absence due to daily life conflicts).

Approximate Grading Guide:

90-100	A
80-89	B
70-79	C
60-69	D
Below 60	F

Plus and minus grades will be given as deemed appropriate.

Policy on Student Collaboration:
It can be very beneficial to your learning process to work with others while learning a new topic. This is appropriate for homework and take-home projects, but all students must turn-in their own work in their own handwriting. All quizzes and exams are expected to be solo endeavors.

Calculator:
There are many calculators out there that are appropriate for this class. Your calculator should be able to calculate *one-variable* and *two-variable statistics* (i.e. mean, variance, correlation, etc.). Whichever calculator you choose, just make sure you are familiar with your own calculator.

Some calculators that perform such statistics:
TI 83 Plus, TI 86 (more expensive graphing calculators)
TI 30XIIB, TI 30XIIS, TI36X (less expensive, but have correct capabilities)

Resources for Additional Help:

- *TA and Professor Office Hours*: Our office hours are a great resource for students. Please take advantage of them.

- *Statistics Tutorial Lab*: There is a *free* statistics tutorial lab. During available times, a knowledgeable person will be present to assist students. Information on the lab can be found at

  http://www.stat.uowa.edu/resources/tutoring

- *Private For-Pay Tutors*: The Department of Statistics and Actuarial Science maintains a list of private tutors at

  http://www.stat.uiowa.edu/resources/tutoring

Electronic Communication :
University policy specifies that students are responsible for all official correspondences sent to their standard University of Iowa e-mail address (@uiowa.edu). Students should check this account frequently. (Operations Manual, III.15.2. Scroll down to k.11.)

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

Academic Honesty:
The College of Liberal Arts and Sciences expects all students to do their own work, as stated in the CLAS Code of Academic Honesty. Instructors fail any assignment that shows evidence of plagiarism or other forms of cheating, also reporting the student's name to the College. A student reported to the College for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

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.

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. www.uiowa.edu/∼sds/

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.

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.

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://www.uiowa.edu/∼pubsfty/intlinks.htm