

**Department of Statistics and Actuarial Science**  
**Probability & Statistics for Engineering & Physical Sciences (STAT:2020)**

Spring 2020

STAT:2020:OAAA, 12:30-1:20 PM, MWF, 100 PH

STAT:2020:0BBB, 3:30-4:20 PM, MWF, W290 CB

<https://homepage.stat.uiowa.edu/~mbognar>

▷ **General Information**

- *Instructor:* Matt Bognar, 358 SH, 335-0799, [matthew-bognar@uiowa.edu](mailto:matthew-bognar@uiowa.edu)
- *Office Hours:* 10:00-11:30 Wednesday, 1:30-3:00 Thursday, and by appointment
- *DEO:* Kung-Sik Chan, 241 SH, 335-0712
- *Textbook:* Wapole, Myers, Myers, and Ye (2013). *Essentials of Probability and Statistics for Engineers and Scientists*, Pearson.
- *ICON/Web:* This course will use ICON (<https://icon.uiowa.edu>) for grades and our course website (<https://homepage.stat.uiowa.edu/~mbognar>) for announcements, homework assignments, etc.

▷ **Course Objectives**

- In this course we will cover the following topics (in roughly this order):
  - \* Counting techniques, probability, conditional probability, Law of Total Probability, Bayes Theorem
  - \* Random variables, expectation, variance
  - \* Uniform, binomial, geometric, hypergeometric, negative binomial, Poisson, exponential, and normal distributions
  - \* Sampling distributions, Central Limit Theorem
  - \* Data collection, summary statistics, graphical displays
  - \* Inference (confidence intervals and hypothesis testing) for a mean  $\mu$  ( $Z$  and  $t$ )
  - \* Inference for  $\mu_1 - \mu_2$  (assuming equal variances)
  - \* Inference for a proportion  $p$  (Wald and Agresti-Coull CIs, score test)
  - \* Chi-square test for independence, chi-square goodness of fit test
  - \* Inference for a population variance  $\sigma^2$
  - \* Propagation of error (Delta Method)
  - \* Correlation and simple regression (including inference)
  - \* One-way ANOVA
  - \* Students will learn how to assess statistical significance for all inference procedures
- We will learn how to do some of the statistical analyses described in class using *Excel* as well as the sweet statistical software package *R*. *R* is available in the campus computer labs; it is also available for free at <https://www.r-project.org>. Hand computation will be stressed, however.
- We will *not* cover all parts of each chapter listed above. Focus your readings on the material that was covered in class. Supplementation to the textbook, when needed, will be provided.

▷ **Grading**

- *Exams:* There will be 2 midterms (17.5% each) and a final exam (25%). Exam dates:
  - \* Exam 1: Monday, February 24 (in class)
  - \* Exam 2: Monday, April 6 (in class)
  - \* Final Exam: TBA

Students are expected to be present for the exams at the *scheduled time*. It is your responsibility to make the appropriate arrangements *beforehand*.

- *Quizzes:* (25% total) A quiz will be given in lecture each Friday (except on the Fridays before the midterm exams). *Make-up quizzes will not be allowed under any circumstances*. The lowest two quiz scores will be dropped. Unannounced quizzes may be given at any time.

- *Homework*: (10% total) Homework will be due each Friday. A subset of the assigned problems will likely be graded. *Late homework will not be accepted under any circumstances.* The lowest two homework scores will be dropped. Homework must be *stapled, defuzzed, neatly written in pencil, and look professional (points will be deducted for failing to do so).* Excessively sloppy homework will receive a score of 0. Print your name and discussion section in the upper right corner of your homework before handing-in.
- *Discussion*: (5% total) Your TA will take attendance in discussion. This constitutes 5% of your grade. No exceptions will be made for class conflicts, conferences, etc.
- Your attendance, participation, preparedness, work ethic, etc. may affect your final grade.
- This course uses the +/– grading system (i.e. grades such as A–, B+, and B will be assigned).
- **This course is not curved.** Grade cutoffs will follow the usual 90, 80, 70, 60 breakdown.
- **It is your responsibility to bring a calculator, tables, and pencils to the exams and quizzes.** Each item borrowed from Matt or your TA (if we have one available) will result in a 10 point deduction on the exam, and a 5 point deduction on the quiz.
- **You may not share calculators, tables, etc. during quizzes and exams.**
- Bonus points may be given at any time. The bonus points may be applied to any part of your grade.
- *Statistics Tutorial Lab*: More information can be found at

<https://www.stat.uiowa.edu/resources/tutoring>

A list of private tutors can also be found here.

▷ *Academic Misconduct*

- **During quizzes and exams, you may not talk, whisper, pass notes, view other students' work, allow a fellow student to view your own work (cover your paper), communicate with a fellow student in any way, use a cell phone, use class notes, etc.**
- **You may not discuss the quiz with anyone until Friday evening at 5:00 PM.**
- **You may not discuss the exam with anyone until Monday evening at 5:00 PM.**
- If you finish all homework problems in their entirety, you may then work with a fellow student, to compare methods, answers, etc. *Simply copying a another student's homework will be considered academic misconduct.*
- All academic misconduct will receive the following sanctions:
  - \* You will receive a 0 on the exam/quiz/homework on which the academic misconduct took place.
  - \* **A report will be filed with the UI.**
  - \* **Your final grade will be lowered by 2 full letter grades (e.g. from a B+ to a D+).**
- Students are encouraged to contact Matt (or your TA) about fellow students possibly engaging in academic misconduct. Your identity will remain totally anonymous.

▷ *The College of Liberal Arts and Sciences Policy and Procedures*

- *Absences and Attendance*: Students are responsible for attending class and for contributing to the learning environment of a course. Students are also responsible for knowing their course absence policies, which will vary by instructor. All absence policies, however, must uphold the UI policy related to student illness, mandatory religious obligations, including Holy Day obligations, unavoidable circumstances, or University authorized activities (<https://clas.uiowa.edu/students/handbook/attendance-absences>). Students may use this absence form to aid communication; the instructor will decide if the absence is excused or unexcused (<https://clas.uiowa.edu/sites/default/files/ABSENCE%20EXPLANATION%20FORM2019.pdf>).
- *Academic Integrity*: All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty. Misconduct is reported to the College, resulting in suspension or other sanctions, with sanctions communicated with the student through the UI email address (<https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code>).
- *Accommodations for Disabilities*: UI is committed to an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as mental health, attention, learning, vision, and physical or health-related condition) by registering with Student Disability Services (SDS). The student is then responsible for discussing specific accommodations with the instructor. More information is at <https://sds.studentlife.uiowa.edu/>.

- *Administrative Home of the Course:* The College of Liberal Arts and Sciences (CLAS) is the administrative home of this course and governs its add/drop deadlines, the second-grade-only option, and related policies. Other colleges may have different policies. CLAS policies may be found here: <https://clas.uiowa.edu/students/handbook>.
- *Communication and the Required Use of UI Email:* Students are responsible for official correspondences sent to the UI email address (uiowa.edu) and must use this address for all communication within UI (Operations Manual, III.15.2).
- *Complaints:* Students with a complaint about an academic issue should first visit with the instructor or course supervisor and then with the Chair of the department or program offering the course; students may next bring the issue to the College of Liberal Arts and Sciences. For more information, see <https://clas.uiowa.edu/students/handbook/student-rights-responsibilities>.
- *Final Examination Policies:* The final exam schedule is announced around the fifth week of classes; students are responsible for knowing the date, time, and place of a final exam. Students should not make travel plans until knowing this information. No exams of any kind are allowed the week before finals. Visit <https://registrar.uiowa.edu/final-examination-scheduling-policies>.
- *Nondiscrimination in the Classroom:* UI is committed to making the classroom a respectful and inclusive space for all people irrespective of their gender, sexual, racial, religious or other identities. Toward this goal, students are invited to optionally share their preferred names and pronouns with their instructors and classmates. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University's Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity (<https://diversity.uiowa.edu>).
- *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 must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, please see <https://osmrc.uiowa.edu/>.