

**Department of Statistics and Actuarial Science**  
**Probability & Statistics for Engineering & Physical Sciences (STAT:2020)**  
Spring 2023  
STAT:2020:0AAA, 12:30-1:20 PM, MWTh, 100 PH

▷ **General Information**

- *Instructor:* Max Sampson, 207 SH, [max-sampson@uiowa.edu](mailto:max-sampson@uiowa.edu)
- *Office Hours:* Wednesday 2:00-3:30, Friday 10:00-11:30, and by appointment
- *DEO:* Kung-Sik Chan, 241 SH
- *Course Supervisor:* Matt Bognar, 358 SH [matthew-bognar@uiowa.edu](mailto:matthew-bognar@uiowa.edu)
- *Office Hours:* Wednesday 10:00-11:30 & Thursday 1:30-3:00
- *Phone:* 319-335-0799
- *Textbook:* Montgomery. Applied Statistics and Probability for Engineers, 7th Edition ISBN: 9781119585596
- *Supplementary Textbook:* Walpole, Myers and Ye. Probability and Statistics for Engineers and Scientists, 9th Edition ISBN: 9780321629111
- *ICON/Web:* This course will use ICON (<https://icon.uiowa.edu>) for grades, 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
  - \* Linear combinations of random variables, Propagation of error (Delta Method)
  - \* 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,  $\sigma^2$
  - \* One-way ANOVA
  - \* Correlation and simple linear regression (including inference)
  - \* Students will learn how to assess statistical significance for all inference procedures
- We will *not* cover all parts of each topic 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 two midterm exams (17.5% each) and a final exam (25%). Exam dates:
  - \* Exam 1: Friday, February 17 (Tentative)
  - \* Exam 2: Friday, March 31 (Tentative)
  - \* 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*.

- \* *It is your responsibility* to bring a calculator, pencils, and statistical tables to the exams – borrowing one of these items from your TA or Max (should we have one available) will result in a 10 point (i.e. 10%) deduction for each item borrowed.

- \* Failure to properly fill out the scantron with the exam form will result in a 25 point (i.e. 25%) deduction.
- \* If you must miss an exam, you must directly inform Max **before** the exam begins. You will be required to provide full, detailed, irrefutable documentation.
- *Scheduled Quizzes:* (25% total) Scheduled quizzes will be take place every Friday at the end of the lecture.
- *Homework:* (10% total) Homework will be due most Fridays. Homework will be submitted via ICON, it must be written neatly, sized appropriately, and solutions must appear in the order assigned. Only one file containing all the work and solutions should be submitted. No credit will be given for homework not in this format. The lowest two homework scores will be dropped. Students are encouraged to work together on homework but work submitted must be your own.
- *Discussions:* (5% total) Students are expected to attend and participate in scheduled discussions. Material will be covered in discussion that will not be provided in lecture.
- Your attendance, participation, preparedness, work ethic, etc. will 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 class.** No extra calculators, tables, or pencils will be available for quizzes or exams.
- **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.
- *Tutoring:* A list of private tutors can be found at

<https://stat.uiowa.edu/private-tutor-list>

#### ▷ *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 midterm with anyone until I hand it back.**
- **You may not copy assignments off of online solution manuals (eg Chegg).**
- 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 me about fellow students possibly engaging in academic misconduct. Your identity will remain anonymous.

#### ▷ *General Notes*

- If you decide to communicate via email, make sure you are proper email etiquette. See here for a checklist: <https://drexel.edu/graduatecollege/professional-development/blog/2018/October/12-tips-for-writing->
- Do not miss class. Attendance is necessary for success.
- Refrain from talking, eating, using your phone, wearing earbuds, and using other electronic devices in class.
- Work a lot of practice problems. *Frequently quizzing/testing yourself is the best, most efficient way to learn the material.* Don't memorize; try to understand.
- Constructive feedback is welcome at any time.

▷ ***Student Complaints***

Students with a complaint about a grade or a related matter should first discuss the situation with the instructor, and finally with the Director or Chair of the school, department, or program offering the course.

Students should contact CLAS Undergraduate Programs for support when the matter is not resolved at the previous level.

▷ ***Drop Deadline for this Course***

You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the drop deadline for this course here. When you drop a course, a “W” will appear on your transcript. The mark of “W” is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the Registrar’s website. Undergraduate students can find policies on dropping and withdrawing here. Graduate students should adhere to the academic deadlines and policies set by the Graduate College.

▷ ***The College of Liberal Arts and Sciences Policy and Procedures (Hyperlinks)***

- Accommodations for Students with Disabilities
- Basic Needs and Support for Students
- Classroom Expectations
- Exam Make-up Owing to Absence
- Free Speech and Expression
- Mental Health
- Military Service Obligations
- Non-discrimination
- Religious Holy Days
- Sexual Harassment/Misconduct and Supportive Measures
- Sharing of Class Recordings