The University of Iowa
College of Liberal Arts and Sciences

Department of Statistics and Actuarial Science
Biostatistics (STAT:3510)

Fall 2024
STAT:3510:0AAA, 1:30-2:20 MWF, 100 PH

`https://homepage.stat.uiowa.edu/~mbognar`

▷ ***General Information***

- *Instructor:* Matt Bognar, 358 SH, 335-0799, `matthew-bognar@uiowa.edu`
- *Office Hours:* 10:30-Noon Wednesday, 1:30-3:00 Thursday, and by appointment
- *TA's:* See website
- *DEO:* Prof. Kung-Sik Chan, 241 SH, 335-0712
- *Textbook:* Samuels, Witmer, & Schaffner (2016). *Statistics for the Life Sciences (5th edition)*, ISBN: 9780321989581, Pearson.
- *ICON/Web:* This course will use ICON (`https://icon.uiowa.edu`) – our ICON page will be used for grades, quiz/exam keys, etc. Our webpage will be used for announcements, homework assignments, etc. (`https://homepage.stat.uiowa.edu/~mbognar`).

▷ ***Course Objectives***

- In this course we will cover the following topics (in roughly this order):
  - Descriptive statistics and statistical graphics
  - Probability – addition and product rules, independence, conditional probability, Law of Total Probability, Bayes Theorem
  - Probability distributions – expectation and variance; binomial, geometric, Poisson, and normal distributions
  - Sampling distributions, Central Limit Theorem (CLT)
  - Inference for μ (σ known, σ unknown) and $\mu_1 - \mu_2$ ($\sigma_1 = \sigma_2$, $\sigma_1 \neq \sigma_2$)
  - Inference for p (Wald and Agresti-Coull confidence intervals, Score test) and $p_1 - p_2$
  - Categorical data - Relative risk, odds ratio, Chi-square test for independence, Chi-square goodness of fit test, Simpson's paradox
  - One-way ANOVA (including Bonferroni pairwise comparisons)
  - Correlation and simple regression
  - Multiple regression (if time)
  - Non-parametric methods (brief introduction; one and two sample sign test)
- Students learn how to assess statistical significance for all covered inferential procedures.
- We will learn how to do many of the statistical analyses described in class using the statistical software package *R*. *R* is available in the campus computer labs, and *R* can be downloaded 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 (those sections from which homework is assigned). Supplementation to the textbook, when needed, will be provided.

▷ ***Grading***

- **Exams:** There will be 3 midterm exams (15% each) and a final exam (25%). Exam dates:
  - Exam 1: Friday, September 20, in-class
  - Exam 2: Friday, October 18, in-class
  - Exam 3: Friday, November 15, in-class

* Final Exam: TBA

Students are expected to be present for the exams at the scheduled time. Make the appropriate arrangements *beforehand*. If too many conflicts arise from the Friday exam times, the exam will be moved to Wednesday (2 days prior).

* *It is your responsibility to bring a calculator, pencils, and statistical tables to the exams* – borrowing one of these items from your TA or Matt (should we have one available) will result in a 10 point (i.e. 10%) deduction for each item borrowed.
* If you must miss an exam, you must *directly* inform Matt *before* the exam begins. You will be required to provide full, detailed, irrefutable documentation.
* The exam key is released immediately after the exam. As such, we do not allow makeup exams after the official exam time.
* It is crucial to fill out your exam forms correctly. Points will be deducted for failure to do so.

– **Quizzes (20% total):** A quiz will be given each Friday in lecture (except on exam days). *Make-up quizzes will not be allowed under any circumstances.* The lowest two quiz scores will be dropped.

* *It is your responsibility to bring a calculator, pencils, and statistical tables to the quizzes* – borrowing one of these items from your TA (should he/she have one available) will result in a 5 point (i.e. 25%) deduction for each item borrowed.

– **Homework (10% total):** Homework will be due each Friday in lecture. *Late homework will not be accepted under any circumstances.* The lowest two homework scores will be dropped. You will not succeed in this course without doing the homework.

▷ ***Grading Notes***

– Grade cutoffs will be no higher than the usual 90%, 80%, 70%, 60% breakdown.

– Final grade cutoffs are not released.

– This course uses the $+/-$ grading system (i.e. grades such as `A-`, `B+`, and `B` will be assigned).

– Your attendance, participation, preparedness, work ethic, etc. may slightly affect your grade.

– Final averages are computed to 2 decimal places.

– Your final grade is based solely on your performance in this class. Your final grade can not be negotiated. Scholarships, angry parents, academic standing, etc. are irrelevant to the grade you receive in this course.

– Matt reserves the right to give bonus points in lecture via unannounced quizzes, attendance, etc. Bonus points are not available on an individual basis.

▷ ***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), write-on (or read-from) the desktop, use class notes, etc. Also,

1. Cell phones may not be used under any circumstances.
2. Calculators may not be shared.
3. Statistical tables may not be shared.

– If you finish all homework problems in their entirety, you may then work with a fellow student to compare methods, answers etc. *Simply copying another student's homework will be considered academic misconduct.*

– All academic misconduct will receive the following sanctions:

1. A report will be filed with the UI.
2. You will receive a 0 on the exam/quiz/homework on which the academic misconduct took place.
3. **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***

- *Academic Honesty and Misconduct:* All students in CLAS courses are expected to abide by the CLAS Code of Academic Honesty.
- *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.

▷ ***University Policies***

- 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