STAT:3510: 0BBB Biostatistics (SPRING 2020): Syllabus

Lecture location: 1505 SC (Seamans Center)

Lecture times: 12:30P - 1:20P MWF

Instructor: Milan Stehlik  
Office: 205 Schaeffer Hall  
Email: milan-stehlik@uiowa.edu  
Office hours: Tuesday 12:30-14:00 (12:30pm -2:00pm) Friday 10:00am -11.30 am in Schaeffer 205

TA: Steve Manning  
Office: 267 Schaeffer Hall  
Email: steven-manning@uiowa.edu  
Office hours: Monday 1:30pm-2:30pm Tuesday 2:00pm -4.00pm in Schaeffer 267

Discussion session times:
- STAT:3510:0B21 11:00A - 11:50A T 30 SH
- STAT:3510:0B22 11:00A - 11:50A Th 3 SH
- STAT:3510:0B23 12:30P - 1:20P T 150 SH
- STAT:3510:0B24 12:30P - 1:20P Th 74 SH

DEO: Dr. Kung-Sik Chan, 241 Schaeffer Hall, 319-335-0712

Prerequisites: 22M:001 (Basic Algebra) or equivalent

Course description:
The main objective of this course is to help students learn the basic statistical concepts and methods for summarizing, presenting and analyzing data from biological and health sciences. Upon completion of the course students are expected to be able to understand standard statistical analysis results in the biological and health sciences literature. We will cover chapters 1-3, 6-13, 14-15, 17-19. Chapters 5, 21, 22 (time permitting)
In this course we will cover the following topics (in roughly this order):

- Summary statistics, Statistical graphics
- Probability (addition and product rules, conditional probability, Bayes theorem, Independent/Dependent Events)
- Random Variables and Probability Distributions (expectation, variance, Binomial, Poisson)
- Normal distribution, Sampling distributions, Central Limit Theorem (CLT)
- Sampling techniques (SRS, stratified, cluster)
- Experimental design (treatment and control groups, randomization)
- Inference for single proportions, \( p \) and two-sample proportions, \( p_1 - p_2 \)
- Inference for means \( \mu \) (\( \sigma \) unknown)
- Inference for difference in means \( \mu_1 - \mu_2 \) (\( \sigma_1 \neq \sigma_2 \))
- Type I II errors; statistical power
- Correlation and simple regression (including inference)
- Inference for two-way contingency tables (Chi-square tests)
- Nonparametric Tests (time permitting)
- ANOVA (time permitting)
- Multiple regression (time permitting)

Students will learn how to assess significance for inferential procedures.

Students are encouraged to use technology to perform statistical analyses described in class, however, explicit work (formulas, computations, etc.) is required to be shown.

There will occasionally be software demonstrations in class, but no computing is required.

**Text:** The required textbook for this class is: Principles of Biostatistics, 2nd edition, by Marcello Pagano and Kimberlee Gauvreau, 2017, CRC Press.

Computer Software: You will mainly use your calculators but I will show you how to use the free statistical software R, for some basic statistical computing and checking your final answers etc. R can be used through web at http://rweb.stat.uiowa.edu/Rweb.general.html or R can be downloaded on your computer from http://cran.r-project.org/.

**Course webpage:** ICON (http://icon.uiowa.edu) has course information, notes, assignments, solutions, exam preparation materials, and access to grades.

**Assessment:** Your final course grade is computed based on the following proportions:

- 30% Homework
- 40% Two in-semester exams
- 30% Final exam
**Homework:** Ten-eleven homework assignments will be assigned throughout the semester. Homework is due at the beginning of lecture on the due date. Late homework submissions will **not** be accepted unless permission to turn in the homework late has been granted by the instructor prior to the due date. Such permission will be given at the discretion of the instructor and will only be given in extraordinary circumstances. The worst homework will be dropped. Homework is to be completed and submitted individually. Group work is encouraged but all answers must be unique to the student. Submission must be in hard copy form (printed + stapled). No electronic homework submissions allowed.

**In-semester exams:** There will be two in-semester exams, each of the two worth 20% of your final course grade. The tentative dates for these exams are March 4, April 15, but these dates are subject to change. The changes, if any, will be announced at least one week before the exam dates. Each exam is 50 minutes, completed in lecture. There will be no make-up exams.

**Final exam:** The University has tentatively set the final exam on TBD. The final exam is cumulative and may not be taken early under any circumstances.

**Email Etiquette:** I will do my best to answer email questions within 24 hours. Here are a few suggestions to ensure I answer your email:

- Check the syllabus/announcements/slides before emailing; try to figure things out yourself first.
- Start your email by addressing me (Dear Dr. Stehlik).
- Be clear and concise.
- Use correct spelling and proper grammar.
- Be polite when making requests - do not make demands.
- End your email with a closing and your name.

**Dates of Interest:**
January 22: First day of class
March 4 (tentative): Exam 1
April 15 (tentative): Exam 2
TBD: Final exam

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Administrative Home 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 other policies. These policies vary by college (https://clas.uiowa.edu/students/handbook).

Electronic Communication Students are responsible for official correspondences sent to their UI email address (uiowa.edu) and must use this address for all communication within UI (Operations Manual, III.15.2).

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 should then discuss accommodations with the course instructor (https://sds.studentlife.uiowa.edu/).

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 at diversity@uiowa.edu or diversity.uiowa.edu.

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.

CLAS Final Examination Policies The final exam schedule for each semester 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 final exam information. No exams of any kind are allowed the week before finals. (https://clas.uiowa.edu/faculty/teaching-policies-resources-examination-policies.)

Making a Complaint Students with a complaint should first visit with the instructor or course supervisor and then with the departmental executive officer (DEO), also known as the Chair. Students may then bring the concern to CLAS (https://clas.uiowa.edu/students/handbook/student-rights-responsibilities).

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 must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, definitions, and the full University policy, see https://osmrc.uiowa.edu/.