

Biostatistical Methods I

University of Iowa

BIOS:5710

Fall 2016

Credit: 4 s.h.

Instructor: Prof. Patrick Breheny
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Office hours: Tues. 2:00 p.m. – 3:00 p.m.
Thur. 3:00 p.m. – 4:00 p.m.

Lecture: 12:30 p.m - 1:50 p.m.
Tuesday & Thursday
C301 CPHB

Lab: 2:00 p.m - 3:00 p.m.
Thursday
C310 CPHB

The office hours listed are times during which I will refrain from scheduling other meetings, so you can count on me being in my office. However, I'm typically around all day, so feel free to knock on my door or to e-mail me in order to set up an appointment. If for any reason I have to cancel office hours on a particular day, I will post an announcement to the course webpage.

Course description: This course provides an introduction to the most commonly used statistical methods in the biomedical sciences. We will cover the basic principles of experimental design as well as the fundamental concepts of statistical inference as we discuss estimation and hypothesis testing for one- and two-sample studies involving continuous and categorical data. The goal is to provide the student with a sound understanding and comfort level with the basic, fundamental methods that comprise the majority of types of analyses that a practicing masters-level statistician would do on a daily basis, including the use of statistical software packages to carry out these analyses.

Textbook (Recommended): *Biostatistics: A Methodology for the Health Sciences, 2nd edition* (2004), VAN BELLE, G., FISHER, L. D., HEAGERTY, P. J., and LUMLEY, T.

Prerequisite: Two semesters of calculus.

Course website: The schedule of topics for the course, as well as notes, assignments, labs, data sets, and other relevant materials will be made available on the course web site:
<http://myweb.uiowa.edu/pbreheny/5710/f16>

Homework: There will be one homework assignment per week, due the following week at the beginning of class on Thursday. Graded assignments will be returned the following Tuesday. If you turn in an assignment on Friday, I will still grade it and return it to you on Tuesday, but a 50% penalty will be deducted.

Feel free to work in groups and/or compare answers with other students, although each student must turn in a copy of each assignment. Group discussions are not only great ways to make lasting friendships, they are valuable for retention and understanding of the material, and working well in a group is a vital part of being a professional. However, make sure you understand the material, as a substantial portion of your overall grade comes from your exam scores.

Computing: Homework for this course will occasionally involve the use of a computer. You may use any statistical software you would like for this analysis, although the software package that will be covered in lab is R. R is free and open-source, available on all computers throughout the building, and easy to install on a personal computer for all operating systems.

Exams: There will be two midterm exams in this class, as well as a comprehensive final. All exams are closed-book, closed-note. The exams will take place during class time on the following dates:

Exam 1	Thursday, October 6
Exam 2	Thursday, November 17
Final	To be determined

You will be asked to perform calculations on these exams, so bring a calculator – not a cell phone – with you.

Grading: Your grade will be based on a weighted average of homework (25%), Exam 1 (21%), Exam 2 (21%), and the Final Exam (33%).

Attendance: Regular attendance in this course is expected. No direct penalty will be applied for missing lectures. However, assignments, exams, and the final will be based entirely on lecture material, so skipping lecture is likely to hurt your grade (and, of course, your understanding of the material).

Corrections: Despite my best efforts, my notes occasionally have mistakes in them. If you spot a mistake, I very much want you to let me know about it so that I can correct it. I will award 1 bonus point (to be added to your homework total) for pointing out a typographical error and three bonus points for an error in content. Corrections will be made to the online version of the notes and announced on the course home page.

Electronic communication: I will occasionally send notices to the class through e-mail (to your `uiowa.edu` account), so please check that account regularly.

I look forward to getting to know you, and I hope that we have a great semester together.

Academic misconduct: During exams, you are not allowed to copy off another student, bring or consult reference materials, or use a cell phone or any device capable of messaging, texting, or accessing the internet. Any of these actions will be considered cheating. The University of Iowa takes cheating on examinations very seriously, and has in place a number of rather severe academic sanctions, a guide to which may be found at <http://dos.uiowa.edu/policies/academic-misconduct>.

Complaints: Students with suggestions or complaints should see me first, and if we cannot come to an agreement, I will direct you to the Departmental DEO, Prof. Joseph Cavanaugh, N312 CPHB, joe-cavanaugh@uiowa.edu. Students may also contact the Associate Dean for Education and Student Affairs in the College of Public Health. Another resource for students is the Office of the University Ombudsperson. If a complaint cannot be resolved at the departmental and/or collegiate level, students may file a formal complaint utilizing the procedure specified in Section II, Chapter 29.7 of the Operations Manual: <http://opsmanual.uiowa.edu>.

Disabilities: If anyone has a disability requiring special accommodations, please let me know as soon as possible, so that these arrangements can be made. For more information, visit: <http://sds.studentlife.uiowa.edu>.

Administrative Home: This course is given by the College of Public Health. This means that class policies on matters such as requirements, grading, and sanctions for academic dishonesty are governed by the College of Public Health. Students wishing to add or drop this course after the official deadline must receive the approval of the Associate Dean for Academic and Student Affairs in the College of Public Health. Details of the University policy of cross enrollments may be found at: <http://test.sitenow.uiowa.edu/provost/files/provost.uiowa.edu/files/crossenroll.pdf>.

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 <http://hawkalert.uiowa.edu>.

MS in Biostatistics Competencies:

1. Demonstrate a broad knowledge and understanding of current statistical theory, methods, and practices in the health sciences.
2. Develop statistical designs and implement analyses for health science investigations.
3. Develop computer programs for the management and analysis of data sets.
4. Prepare reports and publications resulting from health science studies.
5. Effectively communicate key statistical principles to a non-statistical audience.

MPH in Quantitative Methods Competencies:

1. Demonstrate a broad knowledge and understanding of statistical techniques used in public health studies and health related scientific investigations.
2. Assume responsibility for the design and implementation of analyses in investigations of public health questions.
3. Apply appropriate statistical methods for inference about public health related questions, and describe the results to public health professionals and educated lay audiences.
4. Serve as an advocate for good statistical design in public health investigations.
5. Interpret the results of statistical analyses in public health related publications for public health professionals and educated lay audiences.
6. Promote the use of sound statistical methods to answer open questions in public health practice.
7. Demonstrate effective written and oral communication skills when communicating quantitative information and statistical inferences to different audiences of public health professionals.

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. The policy in its entirety may be found at Section II, Chapter 4 of the Operations Manual: <http://opsmanual.uiowa.edu>.

If you or someone you know may be a victim of sexual assault, sexual harassment, dating/domestic violence, stalking, or any other behaviors prohibited under this policy, you are strongly encouraged to seek assistance and support. Assistance is available 24 hours a day, 7 days a week, from:

- Rape Victim Advocacy Program (RVAP) – confidential, certified victim advocacy services, 319-335-6000
- Domestic Violence Intervention Program (DVIP) – confidential, certified victim advocacy services, 319-351-1043 or 800-373-1043
- Emergency Department, University of Iowa Hospitals and Clinics – confidential medical services, 319-356-2233
- University of Iowa Department of Public Safety – law enforcement services, 319-335-5022, or 911 from any campus phone

During business hours, you may also seek assistance from the University of Iowa Office of the Sexual Misconduct Response Coordinator at 319-335-6200.