Statistical Methods in Public Health II

Biostatistics 140.623

January 23 – March 15, 2018

Department of Biostatistics

Johns Hopkins University

Bloomberg School of Public Health

Faculty Instructors:

Marie Diener-West, PhD

Leah Jager, PhD

COURSE SCHEDULE AND READINGS
STATISTICAL METHODS IN PUBLIC HEALTH III (140.623)
THIRD TERM
January 23 – March 15, 2018

Faculty Lecturers:

Marie Diener-West, PhD (Section 140.623.01)
Office W1015, 410-502-6894, mdiener@jhu.edu

Leah Jager, PhD (Section 140.623.02)
Office E3531, 410-502-5573, ljager@jhu.edu

Department of Biostatistics
Johns Hopkins University
Bloomberg School of Public Health

Lectures: 10:30 am – 12:00 pm – Tuesday and Thursday

Sommer Hall (E2014) - Section 140.623.01
Sheldon Lecture Hall (W1214) - Section 140.623.02
Panopto Lecture Capture System will be used in both lecture halls
Overflow Room with transmission from Sommer Hall: W5008

Lab 140.923.xx: for review of material through a structured exercise and time for questions:

Lab 01 Monday, 1:30 pm - 3:00 pm - W5030
Lab 02 Tuesday, 1:30 pm - 3:00 pm - W5030
Lab 03 Wednesday, 1:30 pm - 3:00 pm - W5030
Lab 04 Thursday, 1:30 pm - 3:00 pm - W5030
Lab 05 Friday, 1:30 pm - 3:00 pm - W5030
Lab 06 Monday, 3:30 pm - 5:00 pm - W5030
Lab 07 Tuesday, 3:30 pm - 5:00 pm - W5030
Lab 08 Wednesday, 3:30 pm - 5:00 pm - W5030
Lab 09 Thursday, 3:30 pm - 5:00 pm - W5030
Lab 10 R LAB: Friday, 3:30- 5:00 pm – W5030

Please bring your laptop computers to lab. There is open time for questions with two lab instructors between 3:00 pm -- 3:30 p.m. each day.

COURSE SCHEDULE AND READINGS
STATISTICAL METHODS IN PUBLIC HEALTH III (140.623)
THIRD TERM
January 23 – March 15, 2018

Lab Instructors:

Marie Diener-West, PhD
Leah Jager, PhD
Junrui Di (Lead TA)
Jason Ji (Lead TA)
Claire Ruberman (Lead TA)
Haoyu Zhang (Lead TA)

Teaching Assistants:

Ben Ackerman
Sophie Berube
Chih Kai Chang
Weixiang Fang
Gege Gui
Ji Soo Kim
Prosenjit Kundu
Lauren Lan
Omar Mansour
George Mwinnyaa
Madhuram Nagarajan
Max Thayer
Siruo (Sara) Wang
Yunwen Xu
Mingyu (Brian) Zhang
Daisy Zhu

Teaching Assistant Office Hours (optional) starting on **Thurs, Jan 25**:

Monday through Friday 12:15 pm - 1:15 pm in **W2009**

Stata Office Hours in Computer Lab (optional) starting on **Thurs, Jan 25**:

Monday through Friday 2:30 pm - 3:20 pm in **W3025**

COURSE SCHEDULE AND READINGS
STATISTICAL METHODS IN PUBLIC HEALTH III (140.623)
THIRD TERM
January 23 – March 15, 2018

CoursePlus Site:

Available through CoursePlus: Course schedule, lecture notes, self-evaluation problems, Stata lecture notes, problem sets, data sets and solutions, quiz and exam solutions. Panopto recordings from each lecture will be posted within the same day. Purchase of hardcopy material is included in registration.

Suggested Books:

There are no required books for this course. Most introductory statistics textbooks will provide background information. In addition, there are online resources, such as http://onlinestatbook.com/

Some helpful books are:

Bernard Rosner, Fundamentals of Biostatistics, Duxbury, Thomson Brooks/Cole, Belmont, California (now in the 8th edition)

Lawrence C. Hamilton, Statistics with Stata 12, 2012, Duxbury, Thomson Brooks/Cole, Belmont,

Kyle C. Longest, Using Stata for Quantitative Analysis, 2015, SAGE Publications, Inc.

Handheld Calculator:

A handheld calculator is needed for quizzes and examinations. Basic functions should include (+, -, *, /), logarithms and exponents, simple memory and recall, factorial key.

Statistical Computing Package:

Stata 15 Intercooled, Stata Press, College Station, Texas

(Buy through http://www.stata.com/order/new/edu/gradplans/student-pricing/)

This course supports the use of Stata as a statistical analysis package for laboratory exercises and problem sets. However, this year we are launching an opportunity for a limited number of students to participate in a pilot program using the R software package. This pilot program is intended for students who have had prior programming experience and have a rationale for learning R. The R Users Group assembled during first term will continue in third term.

COURSE SCHEDULE AND READINGS
STATISTICAL METHODS IN PUBLIC HEALTH III (140.623)
THIRD TERM
January 23 – March 15, 2018

Course Policies:

- Please email your **faculty lecturer** regarding extenuating circumstances or conflicts regarding course deadlines for quizzes, exams or problem sets.
- Attendance is required for quizzes and exams and expected for lectures and labs.
- Laptops and iPads may be used during lecture for class-related purposes. Common courtesy should be followed.
- Availability for course questions: after lecture, during labs, TA office hours, and Stata office hours.

Exam Policy:

Course exam dates will be provided to students on the first day of class, as well as posted in the syllabus on CoursePlus. Students are expected to take examinations at the assigned times and on the assigned dates.

Previous Conflicts
Students who have a legitimate conflict (e.g., clinical responsibilities, research presentations including travel, jury duty and other court appearances, weddings and personal travel, that were scheduled before the start of the class) with the scheduled exam dates must inform their faculty lecturer in writing via email at least two weeks prior to the scheduled exam date. If conflicts arise within two weeks of the scheduled exam date, the lecturer should be informed in writing immediately and students must provide documentation (e.g. letter from medical provider, school representative, or conference organizer) of the conflict.

Sudden Illness
Students who are not well on or near the exam date must provide medical documentation in the form of a statement on the medical provider's letterhead and based on a clinic visit within two days of the missed exam.

Tardiness
Students who are late for the exam will be given the remaining period of time to complete the exam (that is, they will not be granted additional time). If there is an unforeseen event outside the student's control (such as a traffic accident) that causes tardiness and the student calls the course coordinator to report the impending tardiness, accommodations may be made at the discretion of the faculty.

Unexpected Emergency
Students who experience an unexpected severe personal or family emergency during the course should contact their lecturer as soon as possible. Each case will be handled separately and reasonable effort will be made to allow for completing in a timely fashion missed work and/or exams with the approval of the course faculty lecturers.

COURSE SCHEDULE AND READINGS
STATISTICAL METHODS IN PUBLIC HEALTH III (140.623)
THIRD TERM
January 23 – March 15, 2018

Exam Policy (continued):

Scheduling of Make-up Exams
Exams will typically be re-scheduled after the posted exam date. Students typically will have no more than one week after the scheduled exam date to take a make-up exam. However, exceptions may be made at the discretion of the faculty for an exam to be rescheduled one or two days prior to the scheduled exam date. Or, for intractable legitimate conflicts, an alternative such as a take-home exam may be offered.
If the lecturer is not notified of conflicts prior to the exam, medical documentation is not provided for an illness or the make-up exam is not scheduled according to the procedures described above, students will receive no points for the exam towards their course grade.

Course Grade:

- 20% completion of 4 problem sets
  Problem Set Policy
  - Problem sets may be worked on together and discussed. However, **each student must write up the problem set individually using his or her own words**. Copying work is not allowed.
  - Each Problem Set must be submitted to the CoursePlus drop box by the due date/time or it will not be accepted.
  - If you encounter a technical issue, please contact your faculty lecturer. Otherwise, **NO late submissions will be accepted**.
  - A student has the opportunity to raise an "Unsatisfactory" to a "Satisfactory" performance by correcting and resubmitting work after receiving feedback on the problem set. However, **initial submission of an incomplete problem set will not be considered for correction and resubmission**.

- 5% quiz 1 (through CoursePlus)
- 5% quiz 2 (through CoursePlus)
- 35% midterm examination (in class)
- 35% final examination (in class)

Quizzes and examinations are **individual** work for which a student must work by himself or herself.

COURSE SCHEDULE AND READINGS
STATISTICAL METHODS IN PUBLIC HEALTH III (140.623)
THIRD TERM
January 23 – March 15, 2018

Academic Ethics Code:

- The code, discussed in the Policy and Procedure Memorandum for Students, March 31, 2002, will be adhered to in this class https://my.jhsph.edu/Resources/PoliciesProcedures/ppm/Policy\\ProcedureMemoranda/Students_01_Academic_Ethics.pdf
- Students enrolled in the Bloomberg School of Public Health of The Johns Hopkins University assume an obligation to conduct themselves in a manner appropriate to the University's mission as an institution of higher education. A student is obligated to refrain from acts which he or she knows, or under the circumstances has reason to know, impair the academic integrity of the University.

Disability Support Services:

If you are a student with a documented disability who requires an academic accommodation, please contact Ms. Betty Addison in the Office of Career Services and Disability Support: dss@jhsph.edu, 410-955-3034, or Room W1600.

Course Objectives:

Students who successfully master this course will be able to:

1. Distinguish between the underlying probability distributions for modeling time-to-event data.
2. Recognize the key assumptions underlying a multivariable regression model and judge whether departures in a particular application warrant consultation with a statistical expert.
3. Recognize the influence of sample size on statistical inferences.
4. Conduct a survival regression and correctly interpret the regression coefficients and their confidence interval.
5. Conduct a multiple survival regression and correctly interpret the coefficients and their confidence intervals.
6. Use the Stata statistical analysis or R packages to perform regression analyses.

The course is designed to enable students to develop their data analysis skills. Important datasets will be analyzed by the students throughout the 621-623 course sequence.

COURSE SCHEDULE AND READINGS
STATISTICAL METHODS IN PUBLIC HEALTH III (140.623)
THIRD TERM
January 23 – March 15, 2018

Class	Date	Topic	Suggested Reading*
1	Jan 23	Sample Size Considerations	233 - 234
2	Jan 25	Sample Size Considerations (cont'd)	301 -304; 381-389
3	Jan 30	Review of Generalized Linear Models	
4	Feb 1	Propensity Scores and Other Approaches **PROBLEM SET 1 DUE by 11:59 pm**	
5	Feb 6	Kaplan-Meier Analysis and Cox Regression **QUIZ 1**	758 – 767
6	Feb 8	Multiple Cox Regression:	768 - 783
7	Feb 13	Detailed Example: Cox Regression	
8	Feb 15	Summary and Review **PROBLEM SET 2 DUE by 11:59 pm**	
9	Feb 20	**MIDTERM EXAMINATION**	
10	Feb 22	Life Table Analysis for Binned Data and Poisson Regression	
11	Feb 27	Multiple Poisson Regression	
12	March 1	Example: Multiple Poisson Regression **PROBLEM SET 3 DUE by 11: 59 pm**	
13	March 6	Negative Binomial Regression, Multinomial Regression, Ordinal Regression **QUIZ 2**	
14	Mar 8	Special Topics	
15	March 13	Summary and Review **PROBLEM SET 4 DUE by 11:59 pm**	
16	March 15	**FINAL EXAMINATION**	

***Fundamentals of Biostatistics by Rosner (7th Edition)**