Western University
Epidemiology & Biostatistics

Biostatistics 9681Q
CAUSAL MODELLING

Fall, 2016

LOGISTICS AND CONTACT INFORMATION

Class: K116
Wednesdays, 11:00-2:00 (bring lunch)

Instructor: Greta R. Bauer, PhD, MPH
Associate Professor
Epidemiology & Biostatistics
K200 Kresge
Office hours: After class, or by appointment
519.661.2111 ext 86262
greta.bauer@schulich.uwo.ca

COURSE DESCRIPTION

This course will take a rigorous approach to methods related to causal inference and counterfactual comparisons, including confounding, structuring causal models, analysing mediation, and heterogeneity of effect. Methods include propensity scores, causal diagrams, instrumental variables, regression discontinuity, marginal structural models, and average marginal risks.

Prerequisites: Epidemiology 9553B and Biostatistics 9521B (or 2nd year biostatistics student)

COURSE MATERIALS


TEACHING METHODS

This is a study course, wherein as a small group of learners, we will spend six weeks studying Pearl and colleagues’ new book Causal Inference in Statistics. While this book is not long, it is also not something one just reads. We will move more quickly through Chapters 1 and 2 (where some materials will be review) and spend more time on Chapters 3 and 4.

As a study course, all students will be responsible for bringing to each class one really good question on each section of the assigned reading. We will take turns preparing and presenting materials on the more complex chapter sub-sections. Students will be evaluated based on presentations, questions, and a short project applying these new methods to a causal question.
TECHNOLOGY

An OWL website for the course will be used for submission of question in advance of class (if not brought to class), and for posting study materials and resources after class.

Classes may be audio-recorded only with advance permission of all attendees, and may not be video-recorded. Permission will not be granted for classes involving unpublished materials from the instructor or others.

EVALUATION

Identification of Causal Research Question (5%)
For the second week of class, students will provide 1) a causal research question regarding the effect of a single exposure on a single outcome (precisely defined); 2) a mediation question regarding these same variables plus a mediator; 3) an effect modification question involving the two original variables plus a modifier, and; 4) a question involving both moderation and mediation and all four variables.

Discussion Leadership (30% primary; 20% secondary)
Each student will have primary leadership over two sections of the text. For these, the student will prepare discussion materials and/or slides and be prepared to lead. Each student will have secondary leadership over two additional sections of the text. For these, they should prepare detailed notes, and be prepared to offer additional explanations and examples to support the primary leader.

Discussion Questions (20%)
Each student will prepare one solid question for each section of the text in advance of that class session (excepting the first class). A paper or electronic copy will be turned in prior to (or rights at) the beginning of each class. These questions will guide class discussion.

Application of Learning(25%)
Each student will submit a paper applying methods and theory from the book to the four research questions they identified at the start of class. Maximum 5 pages, single-spaced. Due Friday, October 21.

COURSE SCHEDULE

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<td>Planning for course contributions</td>
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<td>September 28</td>
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IMPORTANT POLICY INFORMATION

Policy on Prerequisites
Unless you have either the requisites for this course or written special permission to enroll in it, you may be removed from this course and it will be deleted from your record. Students may seek permission from the Graduate Chair. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Policy on Accommodation for Medical and Non-Medical Absences
For assignments worth 10% or more, refer to Western University’s Policy on Accommodation for Medical Illness: https://studentservices.uwo.ca/secure/index.cfm. For medical absences involving less than 10% of course grades, documentation may be required at the instructor’s discretion. All non-medical absences must be approved in advance. In the case of an unexpected absence on compassionate grounds, documentation may be required. If documentation is required by the instructor for either medical or non-medical academic accommodation, then such documentation must be submitted by the student directly to the appropriate Faculty Dean’s office and not to the instructor. It will be the Dean’s office that will determine if accommodation is warranted.

Statement on Academic Offences
Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence: http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf

Support Services
As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page http://www.music.uwo.ca/, and our own McIntosh Gallery http://www.mcintoshgallery.ca/. Information regarding health- and wellness-related services available to students may be found at http://www.health.uwo.ca/. Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.html To help you learn more about mental health, Western has developed an interactive mental health learning module, found here: http://www.health.uwo.ca/mental_health/module.html. This module is 30 minutes in length and provides participants with a basic understanding of mental health issues and of available campus and community resources. Topics include stress, anxiety, depression, suicide and eating disorders. After successful completion of the module, participants receive a certificate confirming their participation.

Department & Faculty Offices
The Epidemiology & Biostatistics main office is located in K201 in the Kresge Building on Main campus.