EDMS647: Causal Inference and Evaluation Methods
Spring Semester 2018

Instructor
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Phone: 301/405-3623
e-mail: tsweet@umd.edu

Office hours
Wednesday 3:00-4:00pm
first come, first served,
or at other times by appt

Meeting time: 4:15-7pm Tuesday EDU 1121

Readings:

Required texts:


Additional readings (provided on ELMS) from:


Course Overview

In studies of the effects of educational programs, policies and practices, it is often not possible to conduct controlled randomized experiments. We first discuss the logic of the counterfactual (or potential outcomes) framework for causal inference and concerns regarding the validity of inferences. We then focus on various design and analysis strategies that can be used to help control for potential confounders in educational settings in efforts to obtain unbiased estimates of the causal effects of programs, policies and practices of interest. The course ends with a comparison of the purposes of conducting micro vs. macro evaluations, a discussion of different frameworks for conducting micro evaluations of a program within a single setting, and a review of the standards developed for program evaluation.
Prerequisites for the course are: EDMS646; Co-requisite is EDMS651.

Unlike many EDMS courses, this course will involve substantial reading and discussion. Students will be expected to actively participate in discussions in the methods addressed above.

**Computer program use:** We will be demonstrating and working with statistical models during the course. It is expected that you will bring a laptop with any of the following software loaded: SPSS, SAS, R, or Stata. Instruction in the software will not be provided; it is assumed that you can manipulate data, create new variables, and subset the data, as well as, run and interpret multiple linear regression and logistic regression in the software. *I will model some methods using R, so R proficiency is important.*

**ELMS use:** We will be using ELMS for sharing of course materials. If you are not familiar with ELMS or would just like a refresher, please visit me in office hours the first week of class to quickly run through the ELMS components of our course. *In the case of campus closure, instructional materials will be delivered through our ELMS website.*

**Course Assessment**

**Participation:**
I expect that you will read the assigned reading each week prior to class and ANSWER the reading questions. The week’s discussion will focus on those reading questions and I expect each student to participate in discussion. For those students less comfortable with talking in class, chances for participation also are present in stopping by posting and answering questions on our discussion board, and emailing me with comments about the readings. Each week, I will assign either a 0 or 1 point for your participation. If you must miss a class, you can “participate” by providing a 2-page summary and reflection of the assigned reading for that week.

**Assignments:**
There will be four assignments spaced (sort of) evenly throughout the summer, each is designed to give students an opportunity to apply and practice concepts learned in class. In working the assignments, you are expected to pull together the material from lecture and the texts. *Homework in hard copy form is due by 4:20pm of the due date.* Each weekday late is a 5% deduction.

Assignments should be well-organized and free from spelling, grammatical, and punctuation errors and all assignments must be word-processed. You will need to use Microsoft equation editor or similar software to incorporate any mathematical notation and symbols into your documents. This package is located in Microsoft Word and can be accessed within the document: INSERT → OBJECT → Microsoft Equation 3.0.

**Exams:**

*Mid-term exam:*
This will be a closed-book, in-class, exam. Students are allowed one double-sided page of notes.

*Final Exam:*
This will be a comprehensive closed-book exam during final exams week. Material from the latter half of the course will constitute about 2/3 of the content assessed. Students are allowed two double-sided pages of notes.
Course Grades

This course is not graded on a curve. Your work will be averaged according to the percentages (weights) shown. Final grades will then be assigned based on the scale below:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Assignments -- total points converted to a percentage (each assignment is weighted 6%)</td>
<td>24%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>36%</td>
</tr>
</tbody>
</table>

Overall course percent grade

- 92.0% - 100%: A
- 90.0% - 91.9%: A-
- 88.0% - 89.9%: B+
- 82.0% - 87.9%: B
- 80.0% - 81.9%: B-
- 70.0% - 79.9%: C
- 60.0% - 69.9%: D
- below 60%: F

Unless a computational error has been made, grades will not be changed after the end of the semester.

Grades of “Incomplete:”

Unless you can demonstrate that near catastrophic events (unexpected, and out of the student’s control) have led to a case of extreme hardship, grades of “Incomplete” will not be given.

Academic integrity: The University of Maryland, College Park has a student-administered Honor Code and Honor Pledge. For more information on the Code of Academic Integrity or the Student Honor Council, please visit [http://www.studenthonorcouncil.umd.edu/whatis.html](http://www.studenthonorcouncil.umd.edu/whatis.html). This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. The code prohibits students from cheating, fabrication, facilitating academic dishonesty, and plagiarism. Instances of this include submitting someone else’s work as your own, submitting your own work completed for another class without permission, or failing to properly cite information other than your own (found in journals, books, online, or otherwise). Any form of academic dishonesty will not be tolerated, and any sign of academic dishonesty will be reported to the appropriate University officials.

Special needs: If you have a registered disability that will require accommodation, please see the instructor so necessary arrangements can be made. If you have a disability and have not yet registered with the University, please contact Disability Support Services in the Shoemaker Building (301.314.7682, or 301.405.7683 TTD) as soon as possible.

Religious observances: The University of Maryland policy on religious observances states that students not be penalized in any way for participation in religious observances. Students shall be allowed, whenever possible, to make up academic assignments that are missed due to such absences. However, the student must contact the instructor before the absence with a written notification of the projected absence, and arrangements will be made for make-up work or examinations.
Course evaluations: As a member of our academic community, students have a number of important responsibilities. One of these responsibilities is to submit course evaluations each term through CourseEvalUM in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to CourseEvalUM is confidential. Campus will notify you when CourseEvalUM is open for you to complete your evaluations for fall semester courses. Please go directly to the website (www.courseevalum.umd.edu) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing online, at Testudo, the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

Attendance policies:

- **Missed single class due to illness:** Once during a semester, a student’s self-authored note will be accepted as an excuse for missing a minor scheduled grading event in a single class session if the note documents the date of the illness, acknowledgement from the student that information provided in the note is correct, and a statement that the student understands that providing false information is a violation of the Code of Student Conduct. Students are expected to attempt to inform the instructor of the illness prior to the date of the missed class.*

- **Major scheduled grading events:** Major Scheduled Grading Events (MSGE) are indicated in BOLD on the syllabus. The conditions for accepting a self-signed note do not apply to these events. Written, signed documentation by a health care professional, or other professional in the case of non-medical reasons (see below) of a University-approved excuse for the student’s absence must be supplied. This documentation must include verification of treatment dates and the time period for which the student was unable to meet course requirements. Providers should not include diagnostic information. Without this documentation, opportunities to make up missed assignments or assessments will not be provided.

- **Non-consecutive, medically necessitated absences from multiple class sessions:** Students who throughout the semester miss multiple, non-consecutive class sessions due to medical problems must provide written documentation from a health care professional that their attendance on those days was prohibited for medical reasons.

- **Non-medical excused absences:** According to University policy, non-medical excused absences for missed assignments or assessments may include illness of a dependent, religious observance, involvement in University activities at the request of University officials, or circumstances that are beyond the control of the student. Students asking for excused absence for any of those reasons must also supply appropriate written documentation of the cause and make every attempt to inform the instructor prior to the date of the missed class.
## Course Topic and Reading Calendar – *all is tentative!*

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading (by this date)</th>
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<tbody>
<tr>
<td>Jan 29</td>
<td>Introduction, history, and where we are now</td>
<td>M&amp;W: Chapter 1; SSC: Chapter 1; Washington Post article;</td>
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<tr>
<td>Feb 5</td>
<td>Causal inference, theory, and the potential outcomes framework</td>
<td>M&amp;W: Chapters 2-4; Holland (1986)</td>
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<td>Feb 12</td>
<td>Internal and statistical conclusion validity; construct and external validity</td>
<td>SCC: Chapters 2-3; WWC procedures</td>
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<td>Feb 19</td>
<td>Randomized experiments; design, sample size, and assignment issues</td>
<td>M&amp;W: Chapters 5; SSC: Chapters 8</td>
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<tr>
<td>Feb 26</td>
<td>Sample size/power and Natural experiments (<em>also called “quasi” by SCC</em>)</td>
<td>M&amp;W: Chapter 6, Chapter 8; SCC: Chapter 9</td>
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<tr>
<td></td>
<td><strong>Assignment #1 due</strong></td>
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<tr>
<td>Mar 5</td>
<td>Regression-discontinuity and time series designs and analysis</td>
<td>M&amp;W: Chapter 9; SCC: Chapters 6-7</td>
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<td>Mar 12</td>
<td><strong>Midterm Exam</strong></td>
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<td>Mar 26</td>
<td>Quasi-experimental designs and instrumental variable estimation</td>
<td>M&amp;W: Chapter 10; SCC: Chapters 4-5</td>
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<td>Apr 2</td>
<td>Estimating treatment effects with non-experimental data; intro to propensity score analysis</td>
<td>M&amp;W: Chapter 12</td>
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<td><strong>Assignment #2 due</strong></td>
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<tr>
<td>Apr 9</td>
<td>Propensity score models</td>
<td>Stuart (2010)</td>
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<td>Apr 16</td>
<td>Wrap-up propensity score methods</td>
<td><em>(catch up on reading!)</em></td>
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<td>Apr 23</td>
<td>Macro-micro evaluation frameworks; methods for micro evaluation; Evaluation standards</td>
<td>YSHC: Chapter 24 ;</td>
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<td><strong>Assignment #3 due</strong></td>
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<td>May 7</td>
<td>Conducting Focus Groups, wrap-up evaluation</td>
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<td></td>
<td><strong>Assignment #4 due</strong></td>
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<tr>
<td>May 14</td>
<td>Final Exam</td>
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