Dillard College of Business Administration

BUAD 5633: Business Process – Causal Inference
Tuesday and Thursday at 5:30 pm to 6:50 pm
Room DB 129
Spring 2024

Contact Information
Instructor: Dr. Andrew Holt
Email: Andrew.holt@msutexas.edu
Office: Dillard Building 217
Office Hours: Tuesday: 9:30-10:30
                 Wednesday: 9:00-12:00
                 Thursday: 9:30-10:30

The subject line of any email you send to me must be "**BusinessProcess: First Name, Last Name**". If the subject line is wrong, then I will ignore your email or maybe I will ask you to resend your email with the correct subject line**.**

Course Materials

Introductory Econometrics: A Modern Approach by Jeffery Wooldridge
Mastering 'Metrics: The Path from Cause to Effect by Angrist and Pischke
Using R for Introductory Econometrics by Florian

Download R for free here: https://cran.r-project.org/bin/windows/base/
Download RStudio for free here: https://posit.co/products/open-source/rstudio/

Course Description
Often, businesses want to know the effect their polices and decisions have on revenue, suppliers, customers; however, their policies cannot be implemented randomly. This poses a problem for a data scientist because most of the time non-random policies or decisions cannot be used to infer the effects of said policies or decisions.

This class is designed to teach students commonly used methods of causal inference that take advantage of quasi-natural experiments that allow for the analysis of business policies and decisions.

Objectives:
General Learning Goals: Students will be asked to demonstrate their critical thinking and problem-solving skills by applying statistical learning techniques in their homework assignments and exams. This course aims to contribute to developing students' ability to communicate their analyses in a professional manner. Student's will have to integrate the statistical knowledge they acquire from this course with multiple business disciplines.

Course Specific Learning Goals: Students should learn how to perform data analysis in R. Students are expected to learn the following statistical techniques: Linear Regression, Conditional RCT, Difference-in-Differences, Regression Discontinuity.

Assessments:
1. Homework Assignments: There will be 5 homework assignments. The types of questions on the homework will be similar to the types of questions on the exams.
2. Exams: There will be one midterm exam and one final exam. Each exam is worth 25 points. All exams must be taken in-class.

Missed Exam Policy:
If you miss the midterm exam, then 90% of your grade on the final will replace the missing grade. So, if you miss the first exam and make a 100% on the final, then you get 25 points for your final exam grade and only 22.5 points for the midterm that you missed.

Grading:

Assignment	Points
Homework Assignment # 1	10
Homework Assignment # 2	10
Homework Assignment # 3	10
Homework Assignment # 4	10
Homework Assignment # 5	10
Homework Assignment # 6	10
Midterm Exam	25
Final Exam	25

A= 89.5-100%   C =69.5-79.5%
B= 79.5-89.5%   D= 59.5-69.5%   F= <59.5%

Class Participation:
Students are expected to participate in all class discussions. Sleeping in class, using electronic devices, tardiness, and any class disruption will result in a lower grade. The instructor reserves the right to lower any student's final grade by a letter grade if the student failed to actively participate in class discussions. Because it is impossible to participate in class while not attending class, you must attend class to not receive a lower grade.

Cheating:
Cheating on an assignment will result in a 0 on the assignment and I will also report you to the Chair of the department.

Plagiarism Statement:
``By enrolling in this course, the student expressly grants MSU a "limited right" in all intellectual property created by the student for the purpose of this course. The "limited right" shall include by not be limited to the right to reproduce the student's work product in order to verify the originality and authenticity.''

Tape Recordings:
Students are not allowed to record lectures.

Americans with Disabilities Act
This course follows the university policies and guidelines suggested by the Disability Support Services Office for qualified students. Students are referred to the Midwestern State University Undergraduate Catalog for details.

Campus Carry Policy
Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage at link to MSU campus carry rules and policies.

Syllabus Change Policy
This syllabus is a guide for this course and is subject to change with advanced notice.
References:
Midwestern State University Student Handbook
Midwestern State University Undergraduate Catalog

Course Content

Tuesday	Thursday
January 16 • Syllabus Day	January 18 • Lecture 1 Notes
January 25 • Lecture 2 Notes	January 27 • Lecture 3 Notes
January 30 • Lecture 4 Notes	February 1 • Homework Day
February 6 • Lecture 5 Notes • **Homework 1 Due**	February 8 • Lecture 6 Notes • Coding – Chapter 4
February 13 • Lecture 7 Notes	February 15 • Homework Day
February 20 • Review • **Homework 2 Due**	February 22 • **Exam 1**
February 27 • Lecture 8 Notes	February 29 • Lecture 9 Notes
March 5 • Lecture 10 Notes	March 7 Homework Day
March 12 • Spring Break • **Homework 3 Due**	March 14 • Spring Break
March 19 • Causal Inference - Potential Outcomes Framework •	March 21 • Causal Inference - Omitted Variable Bias
March 26 • Homework 4 Day in Class	March 28 Easter Break
April 2 • Causal Inference - Regression Discontinuity • **Homework 4 Due**	April 4 • Homework 5 Day in Class
April 9 • Homework 5 Day in Class	April 11 • Causal Inference - Difference-in-Differences • **Homework 5 Due**
April 16 • Causal Inference - Difference-in-Differences	April 18 • Causal Inference - Difference-in-Differences
April 23 • Homework 6 Day in Class	April 25 • Homework 6 Day in Class
April 30 • Homework 6 Day in Class	May 2 • Review • **Homework 6 Due**
May 7 • **Final Exam Tuesday May 7th from 8-10pm**	May 9