ECON 456D: Senior Thesis Seminar

Professor Kyle Coombs (he/him/his)
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- Office Hours: T, 4-5pm, W 10:30-11:30am, or by request (Zoom or in-person)
- Class Hours: T/Th 9:30-10:50am
- Office: PGill 277
- Classroom: Roger Williams Hall 413

Course Website: https://github.com/Bates-ECON456-Thesis-Seminar
OH Link: https://calendar.app.google/XF36Ujpg9NcJbSD58

*You can get in touch with me via email, but please always write **[ECON 456 - Senior Thesis]** in the subject. Alternatively, as you start using GitHub, you can raise an issue and type @kgcsport to get my attention. Please add me as a collaborator on your page as well. I will aim to respond as quickly as possible via email or if beneficial to the class, I will share with everyone.*

Note

This syllabus contains a rough outline of the course and may change in the future. If you have any questions, you should check with me. I reserve the right to make changes to this plan at any time during the semester.

Course Description

While the course's primary objective is a written thesis, the overarching objective is for students to become proficient in conducting economic research. Students work toward achieving this objective throughout the semester by completing a sequence of assignments that culminate in the final thesis. In doing so, students gain hands-on experience simultaneously conducting economic analysis and writing about and presenting their work. The in-depth nature of the project allows students to iterate on and refine their ideas over the course of the semester, just as they will as professional economists.

Course Objectives

After this course is done, you should know how to: 1. Create a thesis that is a significant, original contribution to the scholarship within economics. 2. Document sources and methods for transparent and reproducible analysis. 3. Identify appropriate data sources, clean data including sample restrictions and creation of new variables, and analyze data using appropriate empirical methodology. 4. Present research at various stages, both orally and in writing. 5. Discuss the research process with researchers in order to improve economic thinking and gain experience offering useful critiques of others work.

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Course Materials

Course notes, assignments, extra readings, recordings, and all other materials are available on the GitHub class materials repository. If you have trouble finding or affording the materials, please let me know as soon as possible.

Poster session

We will participate in an Economics Department poster session on December 8. You should plan to be responsible for paying only for the $35 poster printing fee.

Data

The department does not have funds to purchase data, but if there is a particular data need, there are some funds via the Dean of Faculty's office that might be helpful. These require an application and funds up to $300 are available.

Software requirements

You may write your thesis using any programming language you choose. That said, I'd encourage you to use R or Stata, as they have the most well-written tools available for economists. To a lesser extent, I can also help you with Python, Matlab, Mathematica, Julia, SAS, and a handful of others.

R and RStudio

- **R:** Download
- **RStudio IDE:** Download

Stata There are two options: 1. Purchase a Stata License for your personal computer - A Student single-user (6-month, Stata/BE) license will be sufficient for smaller-sized data projects. You can purchase a license here. 2. Use Bates Stata license (available in the computer labs)

Etna is a tool for Collaborative File Storage provided by Bates College. You can use Etna to store all your large data files that are regularly backed up.To map Etna as a network drive on your computer, follow the instructions here.

Drive is an app that can be used to sync files between your local computer and your Google Drive account. You can download the app through your bates.edu Google account.

Git/GitHub Desktop

- **Git:** Installation instructions
- **GitHub:** Create an account and register for an education discount here

We'll use GitHub to store and share code and data. You'll need to create an account and a private repository for your final project. I also advise you to register for an education discount, which gives you access to major services including 180 core-hours of free access to GitHub Codespace servers.

GitHub is a fantastic tool for collaboration and tracking changes to your work over time, but it can be a bit intimidating at first. If you're new to GitHub, I'd recommend starting with the GitHub Desktop app. It's a bit easier to use than the command line.

During the semester, I will ask you to maintain your code and writing in your GitHub repository. This will allow me to provide feedback directly on the code you develop and in your written work. When you finish, you will also have a single repository dedicated to this final project that you can share widely with potential employers, graduate schools, and others.

Also, if you are oscillating between working on your personal computer and the lab computers, GitHub can allow you to easily sync your work between the two.

Recommended but not required: There are several typesetting software options that are especially useful for academic and scientific writing. They allow you to write in plain text and then automatically format your document. This is especially useful for writing papers with equations, tables, and citations.

- **LaTeX software options**
  - **TeX Live:** Installation instructions
  - **Overleaf:** Create an account
- **LyX** Download is an alternative to LaTeX that can be more user-friendly. It is not as powerful as LaTeX, but it is easier to learn.

You can use Microsoft Word if you so choose. I think this may cause you more headaches than you expect, but I will accept and provide feedback on Word documents.

Textbook and other readings

There's no set textbook for this course. Readings from select free sources are listed below:

Writing, Research, and Presenting

- The Introduction Formula by Keith Head
- The Middle Bits by Marc F. Bellemare
- The Conclusion Formula by Marc F. Bellemare
- Code and Data for the Social Science: A Practitioner's Guide by Matthew Gentzkow and Jesse M. Shapiro
- How to Give an Aplied Micro Talk by Jesse Shapiro

Econometrics, Statistics, Data Science with R examples

- Causal Inference: The Mixtape by Scott Cunningham
- The Effect by Nick Huntington-Klein

- Mostly Harmless Econometrics by Joshua D. Angrist and Jörn-Steffen Pischke
- Data Science for Economists and Other Animals
- An Introduction to Statistical Learning by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani
  - ISLR Labs
- Practical Econometrics with R by Christoph Hanck
- Spatial Data Science by Edzer Pebesma and Roger Bivand
- Data Visualization: A practical introduction by Kieran Healy
- Curated List by Nathan Tefft
- Library of Statistical Techniques (LOST)

On R

- R For Data Science by Hadley Wickham and Garrett Grolemund
- Advanced R by Hadley Wickham
- Geocomputation with R by Robin Lovelace, Jakub Nowosad, and Jannes Muenchow
- Posit Cheatsheets
- R Programming for Data Science by Roger D. Peng
- Bates Alumni Eli Mokas and Ian Ramsay's RStudio Tutorial
- RStudio Gallery
- R Markdown: The Definitive Guide by Yihui Xie, J. J. Allaire, and Garrett Grolemund

On Stata

- Speaking Stata by Nicholas Cox
- Stata Resources by Professor Bird

Grading overview

The primary determinant of your grade in this course will be the quality of your final written thesis. I view the other course assignments, including peer editing and participating in presentations as both presenter and audience member, primarily as inputs into the final document. I will, however, consider these inputs when assigning your final grade, especially if their quality is noticeably higher or lower than the final thesis. Additionally, exceptionally good or bad posters may move your grade up or down by as much as 2/3 of a letter grade.

While I provide assignments to keep you on track and grade your research process, in grading your papers, I will use the following standard:

A: A well-executed, well-presented paper that addresses an interesting question. With a significant amount of additional work, the paper may be publishable in a respectable professional journal. The paper has no moderate or major deficiencies.

B: Quality undergraduate work that includes moderate deficiencies. This includes well-executed papers that address less-interesting questions. It may also include papers that are not well presented, or which include mediocre technical work. With major work, such a paper might be publishable in a respectable professional journal.

C Acceptable undergraduate work that includes major deficiencies in the concept, presentation, or technical execution. Papers that display good effort, but fail to meet their objectives may fall into this category. Such papers are generally not publishable.

D and F: Unacceptable papers. These fundamentally fail to achieve the purpose of the assignment.

Finer detail on assignments and grading:

Below I provide finer detail on the assignments and grading. I will provide more detail on each

75% of final grade = Thesis & Documentation (8 Assignments & Thesis) Each student will complete a sequence of assignments during the semester; for each assignment, a detailed prompt will be provided. The assignments are listed below.

Assignment	Date	Percent of grade
Project directory/GitHub repository	Jan 16th	~2%
Previous thesis report	Jan 16th	~2%
Two detailed question proposals	Jan 25th	~2%
Introduction	Feb 1st	~10%
Data Report & Documentation	Feb 15th	~5%
Replication Documentation (README)	Feb 27th	~5%
Methods section	March 7th	~6%
Data description	March 14th	~10%
Results	March 19th	~10%
Final Documentation	April 18th	~5%
Thesis	April 18th	25%

To earn full credit on an assignment, the assignment must be submitted on the due date by 12pm Eastern-time (unless stated otherwise in the assignment prompt).

Late assignments will be accepted up to 48 hours after the assigned due date and time, but will receive an automatic grade reduction of 10 percentage points; for example, a late assignment with answers that are 90% correct will earn a grade of 80%.

If an assignment has not been submitted by the end of the 48-hour period, the assignment will earn a grade of 0%.

Assignments will be assigned at least one week before the due date.

If illness or family emergency prevents you from completing an assignment, you must provide documentation to receive accommodations. Please discuss the issue with me as soon as possible to make necessary accommodations.

25% of final grade = Presentations (3 Presentation Assignments & Final Presentation & Poster Session) All presentations will be in-class. For each presentation, a detailed prompt will be provided. Presentations will be on the following dates.

Topic	Date	Percent of grade
Initial pitch	Jan 23rd & 25th	~4.2% of course grade
Proposal	Feb 6th & Feb 8th	~4.2%
Methods & Data Presentation	March 5th & 7th	~4.2%
Final Presentation	April 4th, 9th, and 11th	12.5%
Poster Session	April 12th	Bonus

No student can reschedule a presentation, except under extraordinary circumstances. The reason for this policy is to give all students equal time to prepare for a presentation, and for each student to get used to presenting regardless of the state of their project. If you have an extraordinary circumstance that prevents you from giving a presentation on the assigned date, please speak with me as soon as possible.

Course structure

The subject and structure for each meeting will depend on students' needs. Often there will be active student learning activities including presentations or peer-reviews of writing. Sometimes we will have mini lectures. For instance, if several students will be using a specific methodology, I may take some time to discuss it in class. Other times, class meetings may be converted to office hours or individual meetings. Attendance is required during sessions when we are meeting as an entire class and your active participation and feedback is expected.

Deadlines of note

The course schedule and pace will be dictated by group progress. There are two major binding deadlines:

1. The poster session on Friday, April 12th from 4:15-6:15pm
2. The final thesis is due on April 18th at 5:45pm (the scheduled final exam)

Rough schedule

Class	Topic	Reading	Assignment
Jan 11	Research Questions	Four Steps, Frick et al. (2023), Sommer (2023), Logani (2022)	Two research questions
Jan 16-18	What makes research "good"?	Angrist & Pischke (2008) Ch. 1, Economical Writing, Applied Micro Talk	Create Project Directory and GitHub Repository, Previous Thesis Report
Jan 23-25	Pitches + Identification	The Effect Ch. 5	5-minute presentations of ideas, Two detailed question proposals
Jan 30-Feb 1	Individual Meetings, Reproducible Research	Hidden Decisions	Proposal/Introduction, presentation slots given out

Class	Topic	Reading	Assignment
Feb 6-8	Proposal	Bellemare (2020), [Head (2008)]	Proposal Presentations
Feb 13-15	Workflow & Data report	Practioner's Guide	Data Report
Feb 20-22	Break		
Feb 27-Feb 29	Methods, Data Description	Angrist & Pischke (2008) Ch. 5	Replication documentation
Mar 5-7	Results, Individual Meetings		Methods Section
Mar 12-14	Data Presentations		Data Section
Mar 19-21	Results workshop		
Mar 26-28	Individual Meetings, Poster Workshop		Results due
Apr 2-4	Practice Presentations	Meager (2017)	
Apr 9-11	Final Presentations		
April 12th	Poster Session		
April 18	No class - Final Exams		Final Documentation and Thesis

Other important dates

Librarian Christine Murray will host a Stata refresher on Friday, January 19th from 11:00am-12:30pm in the library computer lab.

Course Policies

Academic Integrity and Honesty

Students are required to comply with the Bates policy on academic integrity in the Code of Student Conduct at https://www.bates.edu/student-conduct-community-standards/student-conduct/code-of-student-conduct/. Don't cheat. Don't be that person. Yes, you. You know exactly what I'm talking about. See https://www.bates.edu/student-conduct-community-standards/student-conduct/academic-integrity-policy/ for a detailed explanation of academic integrity.

Academic integrity is always important, but is especially important to a senior thesis. IT is at the heart of the mission and values of Bates College and is an expectation of all students.

Plagiarism: Violations of academic integrity are serious and can result in severe consequences at both the course and college level. Some intermediate assignments and the final proposal require writing about other polished work. You may not borrow text from the original papers without proper attributions. Plagiarism of any kind for any assignment in this class will result in a grade sanction up to and including failing the course. Depending on the circumstances of the violation, there may be a referral to the dean of students for possible institutional actions. If you are unsure about issues of academic integrity or what is expected or permissible, just ask!

Attendance:

- Attendance is essential for learning; you are warmly invited, encouraged, and expected to attend all class meetings. Attendance will be important not only for your learning, but also for our ability to build a community together and maintain a sense of connection and commitment to one another. Your presence in class matters.
- I recognize that extraordinary circumstances may prevent you from attending class. If you are unable to attend class due to illness or if you are unsure whether to attend class, please contact Health Services for guidance. If for any reason you will not be in class, it is your responsibility to inform me in advance via email. It is also your responsibility to figure out a way to get notes and make up any work that you missed in your absence.
- If we meet for class online over Zoom, attendance is still important. Throughout the course, we will have in-class activities that will require you to come to class prepared to participate. In the event that we meet for class from different physical locations, we are still one class and one community. I will expect you to be prepared to meet at the regularly scheduled time (U.S. Eastern-time). If you are unable to meet virtually at the regularly scheduled times, it is your responsibility to email me to make alternative arrangements.

Artificial Intelligence

I encourage each of you to make use of artificial intelligence-driven digital assistants, like ChatGPT and Github CoPilot. These tools are not a substitute for your own ingenuity, but instead a complement as they are incredibly useful for tasks like coding or proofreading. Please cite whether and where you used ChatGPT in your written work, as you would cite your (human) sources.

Policies on Incomplete Grades and Late Assignments

Throughout the course, I will provide you feedback on your work. It is your responsibility to turn in your work on time.

End of course: If an extension beyond the "grace period" is not authorized by the instructor, department, or college, an unfinished incomplete grade will automatically change to an F after either (a) the end of the next regular semester in which the student is enrolled (not including short-term), or (b) the end of 12 months if the student is not enrolled, whichever is shorter.

Incompletes that change to F will count as an attempted course on transcripts. The burden of fulfilling an incomplete grade is the responsibility of the student.

Accommodations for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Office of Accessible Education and Student Support (AESS) in Ladd Library G35. For more information on Bates' policy on working with students with disabilities, please see the AESS webpage on Requesting Services (https://www.bates.edu/accessible-education-student-support/requesting-services/how-to-register-for-accommodations/).

Non-Discrimination Policy Bates College provides equality of opportunity in education and employment for all students and employees. Accordingly, Bates College affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination.

Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or Bates College policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or Bates College policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. Bates's policies and regulations covering discrimination, harassment, and retaliation may be accessed at https://www.bates.edu/here-to-help/policies/equal-opportunity-policy/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Director of Title IX & Civil Rights Compliance and Title IX Coordinator, Gwen Lexow, at titleix@bates.edu or https://www.bates.edu/here-to-help/make-a-report/.

Accommodations for Families

If you are a parent or guardian of a child, and you are unable to attend class and care for that child for class one day, please be in touch in case you need further accommodations. You are invited to attend the lecture via Zoom or watch it asynchronously if that will make it easier to not miss course material.
