EC 282: Introduction to Econometrics

Spring 2026 Syllabus

Bentley University

Course Description

This course equips you with the foundational econometric skills to analyze data critically, make evidence-based decisions, and communicate your findings effectively. These skills are increasingly valuable in a world where AI tools can assist with coding but cannot replace the judgment needed to ask the right questions or interpret results correctly.

By the end of this course, you will be comfortable working with data using **R** as your primary tool, though you are welcome to use any coding environment you prefer: RStudio, VS Code, Cursor, Claude Code, or other AI-assisted tools. The goal is not to master a particular software but to develop the analytical thinking that transfers across all platforms. You will learn to manipulate data, compute and interpret statistics, build regression models, and draw meaningful conclusions from your analysis.

A central theme of this course is understanding the distinction between correlation and causation. In business, this distinction matters: knowing whether a marketing campaign actually increased sales, or merely coincided with a seasonal uptick, can mean the difference between smart investment and wasted resources. We will explore how randomized experiments establish causality, how to recognize the limitations of observational data, and how to think critically about the claims we encounter in business and policy contexts.

This course is designed to be inclusive and supportive. I believe learning happens best when students feel challenged but not overwhelmed, and when they can see the practical relevance of what they're studying. I will bring examples from my own research and fieldwork, share both successes and failures, and create space for questions and dialogue. My goal is for you to leave this course not just with technical skills, but with the confidence to tackle data problems you haven't seen before.

Knowledge and Skills

- Compute and interpret descriptive statistics and understand what they reveal about business problems.
- Quantify uncertainty through confidence intervals and understand their implications for decision-making.
- Conduct hypothesis testing and interpret results in practical business contexts.
- Build and interpret multivariate regression models to identify relationships in data.
- Understand randomized controlled trials and the foundations of causal inference.
- Recognize the limitations of empirical studies and when conclusions should be drawn cautiously.

Perspectives

- Develop the judgment to know when regression analysis supports causal claims and when it doesn't.
- Understand how causal research designs are implemented in business and policy settings.
- Learn to choose appropriate model specifications, predictors, and functional forms through diagnostic tools.
- Build confidence in using AI-assisted coding tools while maintaining critical thinking about your analysis.

Class Information

Instructor: Onur Altındağ
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Email: oaltindag@bentley.edu
Web: https://www.onuraltindag.info/

Course: EC 282-1 Introduction to Econometrics
Semester: Spring 2026 (January 20, 2026 – May 7, 2026)
Meeting Time: Monday/Wednesday, 3:30 PM – 4:50 PM
Location: Smith Technology Center 100
Delivery Mode: In-Person Lecture

Office hours are held on Mondays and Wednesdays by appointment. Please book a time slot to schedule a meeting. Each appointment is 20 minutes maximum. If you

need to meet urgently or no slots are available, email me directly.

Important Dates and Evaluation

Component	Weight
Homework assignments (due dates on MindTap)	20%
Monday, February 23, 2026 – First Midterm	20%
Wednesday, April 1, 2026 – Second Midterm	25%
Wednesday, May 6, 2026, 3:00 PM – 5:00 PM – Final Exam	30%
Classroom participation	5%

Software and Tools

R: We use R as our primary language for data analysis. R is open-source, widely used in economics and data science, and has excellent resources for learning.

Your coding environment: You are free to use whatever environment works best for you:

- **RStudio**: the traditional IDE for R, great for beginners
- **VS Code**: a versatile editor with R extensions
- **Cursor**: an AI-powered editor that can help you write and debug code
- **Claude Code** or other AI assistants: useful for learning and troubleshooting

The goal is to learn econometric concepts and develop analytical thinking, not to master a specific tool. Use whatever helps you learn most effectively.

AI assistants: You are encouraged to use AI tools (ChatGPT, Claude, GitHub Copilot, etc.) to help you understand code, debug errors, and learn new techniques. However, remember that AI can assist but not replace your judgment. You must understand what your code does and be able to explain your analysis.

Course Materials: Lecture notes, handouts, and additional resources are available on my website under the Teaching section.

You **MUST** create an account on MindTap. This is a digital learning platform that hosts all the required course materials: the e-book of Wooldridge's *Introductory Econometrics: A Modern Approach*, your homework assignments, practice questions, and your course videos. You can additionally purchase the hard copy of the textbook

but it is not required. When you create an account on MindTap, please use your Bentley email.

Registration on MindTap

Course: Section 1 of EC 282 Intro to Econometrics Spring 2026
Instructor: Onur Altındağ

This course requires an online learning platform called MindTap. Follow the instructions below to get started.

Register for your MindTap Course

1. Use the course registration link: https://student.cengage.com/course-link/MTPN5Q5GNHRJ
2. Follow the instructions on screen to create your Cengage account and register for this MindTap course.
3. Begin your temporary access period.

Need help? Visit the Cengage Start Strong Website for step-by-step instructions.

Temporary Access: You can access your MindTap course until 5:00 AM (UTC) on 2/3/2026 for free. At the end of the temporary access period, you will be prompted to purchase access. Your work will be saved and will be available to you again once you've completed your purchase.

NOTE: If the cost of your course materials is included in your tuition, you will not need to purchase access.

MindTap Tips & Training Tools

Learn more about navigating your MindTap course: https://help.cengage.com/mindtap/mt-student/introduction.html

Technical Support & Troubleshooting

Our US-based support team delivers answers and advice via 24/7 online chat, Twitter, live phone support (1-800-354-9706) and through support.cengage.com, which includes helpful articles and tutorials.

If you are having trouble loading MindTap, run the MindTap browser check to make sure your browser is compatible or refer to the MindTap System Requirements. If MindTap isn't loading, be sure to visit Techcheck to see if there is an outage.

Grading

You **MUST** attend all the midterms and the final as there will be no make-up exams in this course. The midterms are **NOT** cumulative. If you miss or are likely to miss a midterm due to an emergency, please contact me as soon as possible. You will need to provide supporting documentation/verification of your absence. I will re-weight your final exam accordingly if you have a valid excuse. Please note that family vacations or missing the school shuttle are not valid excuses.

The final exam **is** cumulative. If you miss the final exam due to an emergency, you will receive an incomplete for this course. Do not take this class if you know that you will not be able to attend the final exam.

You have **10 homework assignments**. The submission method is automated, and no submissions will be accepted after the deadline (even 5 minutes). There will be no exceptions if you fail to complete the assignment. You will obtain full credit if you correctly answer at least 70% of the questions. You have three attempts to answer each question and I will take the maximum for these attempts. You are encouraged to collaborate on homework tasks or to seek assistance from campus resources.

Academic Integrity

Learning is a privilege that demands responsibility. At Bentley, students and faculty are members of an academic community that supports integrity both inside and outside the classroom. The expectation at Bentley is that students will take advantage of the opportunity for intellectual development and, in doing so, will conduct themselves in a manner consistent with the standards of academic integrity. When these standards are violated or compromised, individuals and the entire Bentley community suffer. Students who engage in acts of academic dishonesty not only face university censure but also may harm their future educational and employment opportunities. In other words, don't bring unauthorized materials into exams, don't plagiarize someone else's work, and make sure that your collaborations are conducted in accordance with university and course policy.

All students have access to Bentley's academic integrity policy in the Bentley Uni-

versity Student Handbook. The best way to avoid a problem is to consult with your instructor before taking any action that might constitute a violation.

Support Services

Bias Incident Response

The Bias Incident Response Team (BIRT) provides students affected by bias or bias-related incidents with access to appropriate resources. Where appropriate, BIRT assists the University in its response to situations that may impact the overall campus climate related to diversity and inclusion. More information about BIRT and how to file a bias incident report can be found at: https://www.bentley.edu/offices/student-affairs/birt

Student Accessibility Services

Bentley University abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 which stipulate no student shall be denied the benefits of an education solely by reason of a disability. If you have a hidden or visible disability which may require classroom accommodations, please call Student Accessibility Services within the first 4 weeks of the semester to schedule an appointment. Student Accessibility Services is located in the Office of Student Success (JEN 336, 781.891.2004). Student Accessibility Services is responsible for managing academic accommodations and services for all students with disabilities.

For more information, visit: https://www.bentley.edu/offices/student-accessibility-services

The Undergraduate Academic Services (UAS) Peer Tutoring program offers online one-on-one and small group tutoring services for students who have worked with their instructors and made use of the Learning Centers, but still require additional academic support. Please reach out to me if you need more information.

Attendance Policy

All students must attend the in-person classes. In-person attendance is essential because it allows for real-time interaction, immediate feedback, and the kind of dialogue that makes learning stick. I do not record lectures, so if you miss a class, you miss the material.

If you have an exceptional circumstance that prevents you from attending in person, you must notify me **before** class. If I approve, I will provide you with a Zoom link to join remotely. Remote attendance is a privilege, not a default option.

There may be one or two sessions during the semester when I need to hold class online due to my schedule. I will notify you in advance when this happens.

Tentative Schedule

- Introduction to the course, logistics, syllabus, and expectations.
- Introduction to R.

The Nature of Econometrics and Economic Data (Chapter 1)

The Simple Regression Model (Chapter 2)

Readings:

- Definition of the Simple Regression Model (2-1)
- Deriving the Ordinary Least Squares Estimates (2-2)
- Properties of OLS on Any Sample of Data (2-3)
- Units of Measurement and Functional Form (2-4)
- Expected Values and Variances of the OLS Estimators (2-5)
- Regression on a Binary Explanatory Variable (2-7)

Multiple Regression Analysis: Estimation (Chapter 3)

Readings:

- Motivation for Multiple Regression (3-1)
- Mechanics and Interpretation of Ordinary Least Squares (3-2)
- The Expected Value of the OLS Estimators (3-3)
- The Variance of the OLS Estimators (3-4)

Multiple Regression Analysis: Inference (Chapter 4)

Readings:

- Sampling Distributions of the OLS Estimators (4-1)
- Testing Hypotheses about a Single Population Parameter: The t Test (4-2)
- Confidence Intervals (4-3)
- Testing Hypotheses about a Single Linear Combination of the Parameters (4-4)
- Testing Multiple Linear Restrictions: The F Test (4-5)
- Reporting Regression Results (4-6)

Multiple Regression Analysis with Qualitative Information (Chapter 7)

Note: Depending on our pace, we may or may not have time to cover these topics.

Readings:

- Describing Qualitative Information (7-1)
- A Single Dummy Independent Variable (7-2)
- Using Dummy Variables for Multiple Categories (7-3)
- Interactions Involving Dummy Variables (7-4)
- A Binary Dependent Variable: The Linear Probability Model (7-5)