UNIVERSITY OF RICHMOND
ROBINS SCHOOL OF BUSINESS

ECON 270 Fall 2026
Introductory Econometrics, 1 unit

SYLLABUS

Instructor:	Thomas Zylkin
Office:	BUS 331
E-mail:	tzylkin@richmond.edu (NOTE: All class correspondence will be sent to your Richmond e-mail accounts.)
Office Hours:	Mondays & Thursdays, 9:15am - 10:15am & by appt.
Recommended Book:	Wooldridge, Jeffery, INTRODUCTORY ECONOMETRICS: A MODERN APPROACH. (I will be using the 7th edition but you are more than welcome to obtain used copies and older versions you wish.)

Course Description: Econometrics is the use of data and statistical methods to infer economic relationships. As such, it is a vibrant sub-branch of statistics primarily concerned with:

1. Causal relationships - does increasing exercise make people happier or is it simply that happier people are more likely to exercise?
2. Economic interpretation - do higher earnings by college graduates mainly reflect the value of what they learned in college or is a college degree primarily a "signaling" device for demonstrating one's inherent aptitude for certain professions?
3. Devising estimation approaches suitable for economic data and economic models.

An important point about the practice of Econometrics is that it is equal parts *art* and *science*. It is part *art* because it draws substantially on one's economic intuition about how to think about how different variables relate to one another in the world that we observe. For example, in ECON 101, you will have learned that the observed quantity sold and price of a good are determined in equilibrium by the intersection of Supply and Demand. Therefore, a trained econometrician understands that tracking changes in prices and quantities for a particular product over time cannot tell us anything about either the Supply curve or the Demand curve

for that product without more information. Instead, econometricians use their intuition to isolate variation in the data that is specific to one side of the market or the other.

At the same time, the techniques used in Econometrics require a significant amount of *science*. The mathematical process of inferring relationships from data is called "estimation", and the "estimates" this process produces are often misunderstood or misinterpreted, may not be representative of the population the researcher is interested in, and otherwise may be biased or misleading due to researcher error.

In this class, we will study the artistic and scientific fine points of two standard estimation methods (or "estimators") commonly used in empirical Economics research: the difference-in-differences estimator (which we will study as a simple application of differences in means from your statistics classes) and ordinary least squares, a.k.a. classical linear regression. For each of these estimators, we will establish the assumptions they use to "identify" relationships in the data, the implications of relaxing these assumptions, and how to use economic intuition to guide their application. In doing so, we will provide you with a fundamental grounding to do your own independent empirical research.

Learning Objectives: This course fulfills the following objectives as part of the Economics Department's learning goals:

- Learning goal 1: Our graduates will be able to analyze and think critically to solve complex economic problems.
  - Objective 1.1: Students will produce solutions to economic problems using appropriate quantitative and qualitative techniques.
  - Objective 1.2: Students will identify core issues and evaluate and apply evidence in support of a coherent position or recommendation.
- Learning goal 4: Our graduates will demonstrate economic knowledge.

My own, more specific learning goals include developing the following abilities:

- the ability to identify good research questions that reflect one's own interests,
- the ability to think critically about the applicability of data and statistical methods to a given problem or question,
- the ability to perform basic data analysis tasks using R, and
- the ability to conduct, interpret, and present one's own econometric analysis.

These goals correspond closely with those of the "Quantitative Data Literacy" requirement for general education, which can be viewed here and which this class also fulfills. In addition, I aim for students to acquire a foundational knowledge of econometric techniques, practices, and thought processes.

COURSE REQUIREMENTS AND POLICIES

EXPECTATIONS. You should be prepared to work hard, ask questions, and learn new things. You should also expect the class to have significant theoretical, practical, and discursive elements. At times, you will need to learn some math in order to understand a new concept. At other times, you will be expected to implement the technical material you have learned by writing basic code in R, a popular statistical programming language. In addition, I will ask you to explain why it is that a method should be expected (or should not be expected) to be applicable to a particular research question, how to interpret the estimates it produces both statistically and economically, and what recourses could a researcher use to improve the credibility of their estimates.

That said, this is neither a math class nor a programming class. I expect no prior experience with coding. In terms of math preparation, it will be useful to be comfortable with two-dimensional graphing, basic algebra, and some standard concepts from calculus (finding the minimum of a function). We will not make use of linear algebra, though students with a prior course in linear algebra may be interested to know it plays an important role in more advanced treatments of the subject.

On a day-to-day basis, I expect you to attend all class meetings and to have completed all assigned work and read all assigned readings before class. To be successful, you should be prepared to devote no less than 10 to 14 hours each week, including time spent in class. If you are having trouble with material from previous classes or with completing assignments, please do not hesitate to come to me for help.

EXAMS. There will be two in-class midterms and a final exam, which will be partly in-class and partly take-home. In line with the overall aims of the course, the format of these exams will combine questions that will test your ability to apply concepts in practice as well as your understanding of the underlying theory. A portion of the final exam will require you to first propose a compelling research question and obtain relevant data that can be used to analyze it. These steps will be incorporated into the class as assignments during the semester.

HOMEWORK ASSIGNMENTS. You can expect there to be regular homework assignments throughout the course. Because the type of learning we will be doing is varied, the assignments, too, will be varied. Broadly speaking, you can expect these assignments to be divided into two types: shorter and longer. In shorter assignments, you can expect to solve shorter math-based problems with pen-and-paper and answer short answer questions that test your conceptual knowledge. In longer assignments, you can expect to have to work with data on a computer using R, generate statistical estimates by writing your own code, and/or interpret the output produced by an estimation routine.

DAILY CREDIT. Most class meetings will have some sort of assessment and feedback component that will encourage active listening and participation. Examples include filling out a worksheet alongside your notes, explaining in writing something we just covered, and giving your opinion on something I would like your input on. Your daily credit grade will also reflect your overall participation and engagement in class, including attendance.

GRADING POLICY. The grade that you get in the class will be the grade that you have earned. The only time that I will be willing to change a grade is when I have made a mistake and it has been brought to my attention before the end of the semester. Your final grade will be determined as follows:

Daily credit	(10%)
Homework	(15%)
Midterm I	(15%)
Midterm II	(25%)
Final exam	(35%)

For assigning letter grades, I prefer **5 point increments**. 95-100 is an A, 90-94 is an A-, 85-89 is a B+, and so on (B: 80-84: B. B-: 75-79. C+: 70-74. C: 65-69. C-: 60-64. D: 50-59. F: <50). The highest grade on the final exam in each section automatically receives an A for the course.

NOTE. Your grade on written work for this class will not be merely based on content. I will expect you to express your thoughts in a smooth, clear, and logical sequence, using the concepts we have established in class in an appropriate manner

A WORD ON ACADEMIC INTEGRITY. Violations of the Honor System in this class will not be tolerated and may result in severe academic sanctions. In order to familiarize yourself with the University of Richmond's Honor System as well as the policies in place regarding academic misconduct and dishonesty, you may refer to the following web site:

https://studentdevelopment.richmond.edu/AcademicIntegrityGuide_Students.pdf.

If you have any doubts or questions, please, consult with me.

UNIVERSITY OF RICHMOND POLICIES

Americans with Disabilities Act: Students with documented disabilities who need course accommodations, have emergency medical information or require special arrangements for building evacuation should submit an application to Disability Services and inform the instructor as quickly as possible so we may take steps to accommodate your needs. For further information, visit: http://disability.richmond.edu/students/process/index.html.

Course evaluation: Your feedback about the course and instructor is the only way instructors and academic units can improve the quality of a course and its content. Your honest feedback is greatly appreciated and will benefit students taking this course in the future.

Minimum attendance requirement: Students who are absent without a valid excuse for more than 25% of all scheduled classes will receive a grade of "V" (failure due to excessive absences) and no credit for the course.

COVID-19 guidelines: In the classroom, students will be expected to adhere to any and all guidelines set by the university with respect to COVID-19. In addition, all of us are called on to make an effort to be flexible and to make decisions in the best interest of the community, including staying home when sick. Students who are sick should not attend class, will not be required to provide formal documentation from a health care provider, and will not be penalized for absences.

Generative AI policy: Generative AI tools such as ChatGPT may be used in certain contexts in this class, but these permissible contexts will not include generating answers, responses, or content that directly fulfill the purposes of assignments, quizzes, or exams, as this would violate academic integrity principles as well as the university Honor Code. I reserve the right to update this policy during the semester, but you can expect allowable use to include assignments and demonstrations that ask you to use and/or evaluate generated output.

In addition, this semester I am piloting an **AI tutoring platform** specific to this class that can provide an additional resource for supporting your learning. Productive uses of the course AI tutor include having conversations that deepen your understanding of concepts, clarify the meaning of terms, and/or test your reasoning. That said, though using AI as a resource to assist with your learning is always permissible, using AI to generate answers to assigned course work is absolutely not allowed. Check with me if you have any doubts on what is considered acceptable use.

Religious observance: The University is a secular institution that values diversity of religious expression. The observance of religious holidays is considered a valid reason to be absent from class. If any of the course deadlines and/or exam dates conflict with the observance of your religious obligations, please inform your instructor ASAP.

Dropping a course or withdrawing from a course: Once a student is registered, it is

his/her responsibility to attend the course, drop the course, or withdraw from the course. Dropping and withdrawing are distinct actions governed by different policies and impact a student's course enrollment status differently, Dropping a course causes the name of the course to disappear from the student's transcript. Withdrawing from a course causes both the name of the course and the grade of "M" (if withdrawing with a passing grade) or "W" (if withdrawing with a failing grade) to appear on the student's transcript. Before withdrawing from a course, students should consult the instructor. For further information on these procedures, please see the following website: http://registrar.richmond.edu/services/policies/add-drop.html.

Incomplete policy: A grade of "I" or "Y" may be given if the student's course work has not been completed by the end of the term. The "I" is a provisional failing grade, to be given when the student's reasons for incomplete work are deemed unjustifiable by the instructor. The "Y", which does not count as a failing grade, is given when the student's reasons for not completing are deemed justifiable. In the case of an "I", the work is to be made up by a deadline to be set by the instructor, which may be no more than 45 days beyond the last day of the term. Otherwise, the "I" will become an "F".

Final exams: No final exams will be given outside the exam period without the permission of the Dean. All final exams are scheduled by the University Registrar.

University closure: During the course of a semester, it is possible the university will experience closure. Make-up assignments or make-up sessions of equivalent face-to-face length may be scheduled to make up for lost class time.

Resources for Students: As the university's main hub for supporting student academic skills, the Weinstein Learning Center (https://wlc.richmond.edu/) provides support for general academic skills coaching (including effective studying and time managment), English language learning, quantitative and programming skills, speech and oral, communication (including getting feedback on presentations), and feedback on written work.

For students in need of non-academic support, especially support for mental health and during times of personal crisis, please do not hesitate to contact Counseling and Psychological Services (https://caps.richmond.edu/ or 289-8119). Services include brief consultations, short-term counseling, skills-building classes, therapy groups, crisis interventions, and other related services.

Other policies: More information on policies, procedures, and general governance may be found at the Provost's website. Specific policies and forms for the Robins School of Business are available in Canvas.

	TENTATIVE LECTURE OUTLINE	READINGS	ASSIGNMENTS
T AUG 25	Course introduction. The Goals and Vocabulary of Econometrics.		
Th AUG 27	Our first estimator: Difference-in-Differences. Review of statistical hypothesis testing.	Videos & notes on BB.	HW #1 due.
T SEP 1	Difference-in-differences continued. Parallel trends.		
Th SEP 3	(Re-)introducing simple linear regression using Ordinary Least Squares (OLS)	JW 2.1-2.2	HW #2 due.
T SEP 8	Simple linear regression continued.		
Th SEP 10	OLS properties, Goodness of fit	JW 2.3, 2.5	HW #3 due
T SEP 15	OLS properties and assumptions cont'd		
Th SEP 17	Violations of OLS assumptions. Omitted variable bias.	JW 3.1-3.4	
T SEP 22	Catching up		
Th SEP 24	Review for midterm		HW #4 (longer) due.
T SEP 29	**MIDTERM I**		**GOOD LUCK!**
Th OCT 1	Omitted variable bias continued. Linear regression with multiple regressors.	JW 3.5-3.7	
T OCT 6	Linear regression with multiple regressors continued. Hypothesis testing.	JW 4.4-4.5	
Th OCT 8	Hypothesis testing continued. Categorical variables.	JW 7.1-7.4	
T OCT 13	**FALL STUDY BREAK**		
Th OCT 15	Categorical variables continued. The Frisch-Waugh-Lovell theorem.	notes on BB. JW 3.2	HW #5 due.
T OCT 20	FWL theorem continued.		
Th OCT 22	"To log or not to log"? Elasticity and semi-elasticity	JW 6.1-6.3	
T OCT 27	Interaction models		Final exam pre-assignment I due
Th OCT 29	Catching up		
T NOV 3	Review for midterm		HW #6 (longer) due.
Th NOV 5	**MIDTERM II**		**GOOD LUCK!**
T NOV 10	Posing research questions with Econometrics	notes on BB	
Th NOV 12	"Heteroskedasticity": non-constant error variance	JW 8.1-8.4	
T NOV 17	Something different	notes on BB	HW #7 due
Th NOV 19	Models for panel data (many units observed repeatedly over time)	JW 13.4, 14.3	Final exam pre-assignment II due
NOV 24-26	**THANKSGIVING BREAK**		
T DEC 1	Panel data continued	notes on BB, JW 9.5-9.5b	
Th DEC 3	Instrumental Variables and Two-Stage Least Squares	notes on BB, JW 15.1-15.3	HW #8 (longer) due
T DEC 8	Review for Final exam		
Th DEC 17	**TAKE-HOME PORTION OF FINAL EXAM DUE**		**GOOD LUCK!!!**