



ECON 251: Introduction to Econometrics
Fall 2023

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Course Information

Class Day and Time: TBD

Class Location: TBD

Course Description: This introductory course will introduce you to regression methods for analyzing data in economics. The major topics to be covered include univariate regression analysis, multivariate regression analysis, dummy variable regression models and instrumental variable estimation. The course will highlight the applications of these econometric techniques to different topics in economics and require students to apply the techniques learnt in this course to a relevant research question.

Summarized Course Goal: The course will introduce students to empirical methods of economic analysis. By the end of this course, a successful student will be able to study a research question by formulating and estimating appropriate econometric model, interpreting the results, testing their significance and highlighting their limitations. This course will equip the student with sufficient knowledge to perform data analysis for an entry-level job as a business analyst.

Course Method: This course consists of: lectures, readings, class discussions and group project. For every topic, while relevant slides will be made available via BlackBoard, additional materials will be developed in class. Hence, it is pertinent that you attend the class regularly. Class discussions are an important part of the learning process, and you are highly encouraged to participate in all discussions. Several assignments, quizzes and exams will be handed out throughout the semester. A group project is to be submitted at the end of the semester.

Detailed Course Learning Objectives: Upon successful completion of this course, a student will be able to

- demonstrate a thorough understanding of basic methods of econometric analysis.
- develop empirically testable hypotheses from economic theories.
- identify appropriate techniques of testing various hypotheses.
- understand and explain the results of regression analysis.
- identify the limitations of data analysis arising due to data availability or methodological methods.
- conduct multivariate regression analysis by employing appropriate techniques.
- use STATA for regression analysis.
- communicate the findings of a multivariate regression analysis in the form of a research paper and oral presentation.

Social Science Learning Objectives: Upon successful completion of this course,

- Students will demonstrate an understanding of the scientific study of individual and group behavior.
- Students will demonstrate an understanding of fundamental concepts, theory or methods from economics.
- Students will demonstrate critical thinking about human behavior and society to offer meaningful explanations of social and individual behavior.
- Students will be able to frame social science problems broadly in a way that is accessible to the general population (i.e., not exclusively for majors within a specific discipline)

Required Course Materials

Text: Introduction to Econometrics, James H. Stock and Mark W. Watson. Fourth Edition.

Software: STATA

Recommended Course Materials

Supplemental texts/readings: Introductory Econometrics: A Modern Approach by Jeffery Wooldridge. Seventh Edition

Some other good books:

- Econometrics by Example by Damodar N. Gujarati. Second Edition
- Econometric Data Science: A Predictive Modeling Approach by Francis X. Diebold. This book is available freely [here](#)

Course & Instructor Policies

Important Dates:

- 2 September 2023: Last day to add/drop classes with no tuition charges
- 4 September 2023: Labor Day — No Classes
- 4 October 2023: Exam 1
- 9 October 2023: Fall Break Day — No Classes
- 30 October 2023: Last day to withdraw from course
- 20 November 2023: Exam 2
- 3 December 2023: Last day to request an Incomplete grade
- 4 December 2023 — 9 December 2023: Final Exam Week
- 6 December 2023: Final Project due date

Conflicts due to work or meetings, etc. is not an acceptable excuse to miss the exams. If you have a conflict and are unable to attend these exams, you should reconsider your decision to enroll in this class.

Make-up: No make-up opportunities will be given unless there is a medical emergency or an equivalent documentable catastrophe. Conflicts due to work, meetings, interviews, etc. are not an acceptable excuse to miss any work. Should you miss any work for a documentable catastrophe, you must email me at priyanka.sharma@stuart.iit.edu for request to make-up the missing work **within 24 hours** of missing it. Also, you should provide me a written documentation supporting your excuse. For example, if you were ill and miss a quiz, not only should you notify me within 24 hours, you must also provide me with written verification from your physician saying that you were too sick to take the quiz. I reserve the right to determine whether your documentation is valid to allow you a make-up. If your documentation is found to be fabricated, it will be viewed as a violation of academic integrity and is subject to penalty as defined by the University. If you miss a work and/or are not admitted to the make-up, you will receive a '0' for that work.

Special assignments: Your grade depends exclusively upon your performance on the assignments, examinations and attendance. *To be fair to all students, I will not offer opportunities for doing “extra work” (e.g., book reports or term papers) to raise your individual grade.* Please, do NOT request differential treatment as a way to boost your grades.

Class attendance: Attendance and preparation for class are essential for success on the exams and learning the material well. I will regularly take class attendance. After the add/drop deadline (31 August 2019), class attendance is mandatory and will be used to determine your final grade. Starting from first class after the add/drop deadline, you are allowed to take 3 unexcused absences. If you miss any more than 3 classes, you will lose 0.5 percentage points from class attendance for every absence. For example, if you have 7 unexcused absences then you will lose $(7 - 3)0.5 = 2$ percentage points for attendance. You are responsible for ensuring that your attendance is marked on the same



day when a class is held. I will not allow you to mark attendance for any of the previous classes. If you miss any more than 8 classes (excused or unexcused), you will be asked to withdraw from the class.

Classroom conduct: As a courtesy to me and your fellow students, please arrive in class on time and do not depart early. If for some exceptional reason you must come late or leave early, please let me know in advance and sit close to the door so as to disrupt the class as little as possible. Also, refrain from disruptive behavior (such as talking, reading a newspaper, text messaging on your cell phone, browsing on your computer, etc. You are not allowed to use laptops in the class. However, there are two exceptions to this rule. One, I explicitly ask you to use your laptop to work on an in-class exercise. Second, you have a documented disability that mandates the use of laptop in classroom for learning purposes.

Discussions and Class Participation: Class discussions are a key component, and you are strongly encouraged to enhance everyone's learning experience by asking relevant questions and sharing their insights into the topic at hand. While quality of contribution is more important than quantity, I would strongly encourage you to ask clarifying questions. There is a good chance that if you are lost, so are your class mates and they would deeply appreciate this action. Plus, I would interpret silence as "Oh! This is very easy for me and you should move to the next topic". You are also encouraged to provide clarifying comments or alternative perspective on a given issue. As long as a majority of in-class students feel that they learnt something from you, your class participation is valuable. Class participation is not just about starting a discussion, but also about keeping it moving in a positive direction. I encourage you to "volunteer" to lead classroom discussions while working on practice problems. In case of lack of volunteerism, I will "cold call" randomly. In addition, I will assign "mini assignments" which will count towards your class participation grade.

Discipline: In your interactions with your classmates and me, you expected to abide by the Stuart School of Business Student Etiquette code.

Academic Integrity: All students are expected to act with utmost civility and personal integrity; to respect other students' dignity, rights and property; and to help create and maintain an environment in which all students can succeed through the fruits of their own efforts. Academic integrity includes a commitment to not engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty include cheating or copying, plagiarizing, submitting another persons' work as one's own, using sources without citation, having another student take your exam, tampering with the work of another student, and facilitating other students' acts of academic dishonesty. *If you are caught engaging in any act of academic dishonesty, I will give you a zero in the relevant work and lower your final grade by a letter. If you are caught engaging in academic dishonesty more than once, I will give you a failing grade in this class.*

Additional Help: If you have trouble with material, please see me during office hours (or by appointment) with a list of questions. Use of email for requesting clarifications on these questions is strictly discouraged. Often, it is most beneficial for you to meet us in person to clarify your doubts. And the earlier you do this, the better it is. Don't wait for the moment before the exam to ask your questions.



Communication: I will use BlackBoard for all class related communication and you are responsible for any information posted there. Class slides, readings, announcements and grades would be posted on BlackBoard. Due dates for assignments and quizzes will also be posted on BlackBoard. Emails will be sent to your IIT email account associated with BlackBoard. If you do not use your IIT email, please put a forward in it to the email address you do check daily. Failure to check email/BlackBoard, errors in forwarding email, and returned email due to “mailbox full” or “user unknown” will not excuse a student from missing announcements or deadlines.

Grading System/Policy

Final Scores: The final score and final letter grade will be based on your performance on assignments, quizzes, exams and class attendance. The weights assigned to these various components are as follows:

Home Assignments	20%
Quizzes	10%
Exam 1	20%
Exam 2	25%
Class Attendance	5%
Final Project	20%

Final letter grades will be determined by the weighted score you earn in this course. In calculating your final scores, I will drop 1 home assignment and 1 quiz with lowest grade. As a preliminary and worst-case scenario, I will use the following standard. The minimum number of points required for each letter grade is:

A :	above 90%
B :	80% - 89.9%
C :	70% - 79.9%
D :	60% - 69.9%
E :	below 60%

Above standard may be changed based upon the performance of all students enrolled in the class. I assure you the revised standard will not be higher than this and it is possible the standard will be lower, but that will not be known until after your final scores are calculated.



Home Assignments: There will be 6 graded home assignments. Unless specified otherwise, home assignments will be due at 6.00 p.m on the day that they are due (mostly Sundays). The due dates for assignments will be posted on BlackBoard. **All home assignments need to be turned in electronically by uploading them on BlackBoard in a single .pdf or .doc file.** Do not email me your assignments. Plan ahead and do not wait until the last moment to complete them. If you start them well in advance of the final deadline, you will be able to submit them on time (even if a server goes down or another unforeseen difficulty occurs). Late submissions are permissible, but carry a penalty. If you submit your homework within 12 hours of the deadline, you will get only 75% credit. If you submit your work within 12 - 18 hours past the deadline, you will get only 50% credit. Submissions made after 18 hours will be graded, but will not receive any credit. Finally, if you have any questions or problems with the BlackBoard system, you should contact OTS at supportdesk@iit.edu. Do not contact me for technical problems with BlackBoard.

Quizzes: There will be 3 quizzes. Unless announced otherwise, all quizzes will be held in-class. Tentative dates for quizzes are provided in the weekly schedule provided at the end of this syllabus.

Exams: There will be 2 exams. Exam 1 will be given in class on 4 October 2023 (Wednesday). Exam 2 will be given in class on 20 November 2023 (Monday). In determining your final score, Exam 1 will be assigned a weightage of 20% and Exam 2 will be assigned of weightage 25%. In aggregate, exams will determine 45% of your final scores.

Final Project: You will have to work on your project individually. It will require you to apply the statistical methods learnt in this class to a data set provided to you. More details on the project will be provided in class. I will be happy to provide feedback on the earlier versions of your project and allow you to revise it after incorporating my comments. However, the final version of the project is due on BlackBoard at 11.59 p.m on 6 December 2023 (Wednesday). Late submissions will be given a zero. This project will be utilized to access students' performance on social science learning objectives.

Incompletes: A grade of "I" will be assigned only in case of unforeseeable circumstances. Prior to requesting an incomplete grade, the student must have successfully completed atleast 75% of the course requirements.

Disabilities

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone 312 567.5744 or or disabilities@iit.edu



Sexual Harassment and Misconduct Information:

Our school encourages anyone experiencing sexual harassment/misconduct to speak with someone about what happened, so they can get the support they need and the school can respond appropriately. Many areas of the University are required to report incidents of sexual harassment/misconduct and thus cannot guarantee confidentiality.

If you wish to speak confidentially about an incident you believe falls under sexual harassment/ misconduct, please contact the school's **Confidential Advisor service** at (773) 907-1062.

If *you* want more information about filing a report, or have questions about the school's sexual harassment policies and procedures you may contact:

- Virginia Foster the Title IX Coordinator at (312) 567-5725 foster@iit.edu
- Katherine Stetz the Dean of Students at (312) 567-3081 dos@iit.edu
- To **file an online complaint** go to iit.edu/incidentreport

For a list of **resources** go to the University's Title IX office website: <https://web.iit.edu/hea/resources>

Copyright/Plagiarism/Academic Integrity Rules on Plagiarism and Academic Integrity

Plagiarism and other violations of academic integrity are strictly prohibited and subject to penalty as defined by the University. Information about the Illinois Tech academic requirements for graduate students can be found at:

<https://web.iit.edu/student-affairs/handbook>

The academic integrity material is in the Illinois Tech student handbook. Other parts of the handbook contain other rules that apply to all students. Students will be expected to conform to the rules and procedures set forth in the handbook.

The code of conduct governing writing by students at Illinois Tech requires original writing, prohibits plagiarism and provides severe sanctions for plagiarism. Original writing consists of thinking through ideas and expressing them in your own way. If the ideas are from other sources, use footnotes or other citation methods to indicate the source of the ideas. Plagiarism is the act of passing off someone else's work or ideas as your own. The sanctions include, but are not limited to, expulsion and the imposition of a punitive grade of 'E'.

What is Plagiarism?

Often there is some confusion as to what constitutes plagiarism. Plagiarism is the act of passing off someone else's work as your own. To assist in providing an understanding of the types of writing that constitute plagiarism, three types of are each discussed below. Also discussed below is the problem of "string citations." String citations are not plagiarism, but many professors will reject string citations because they are not the student's original work.

Word for Word copying: The use of any phrase or excerpt from another source requires the use of quotation marks around the copied material, or if the material is more than a few lines, the copied material should be placed in its own indented paragraph. A citation in proper form is always required to identify the source.

Plagiarizing by Paraphrase: When a writer uses a source, substitutes words and sentences, or even changes the order but keeps the meaning of the original, a citation is required. In the example given below, the original is on the left. The paraphrase in the right box constitutes plagiarism.

Original: It is not generally recognized that at the same time when women are making their way into every corner of our work-world, only one percent of the professional engineers in the nation are female. A generation ago, this statistic would have raised no eyebrows, but today, it is hard to believe.	Paraphrase: Few people realize now that women are finding jobs in all fields, that a tiny percentage of the country's engineers are female. Years ago this would have surprised no one, but now it seems incredible.
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The writer could avoid plagiarism here by acknowledging the source and providing a proper citation.

Mosaic Plagiarism: Here the writer lifts phrases and terms from the source and embeds them in his own prose. An example follows in which the lifted phrases are underlined:

The pressure is on to get more women into engineering. The engineering schools and major corporations have opened wide their gates and are recruiting women zealously. Practically all women engineering graduates can find attractive jobs. Nevertheless, at the moment, only one percent of the professional engineers in the country are female.

Mosaic plagiarism is sometimes caused by careless note taking. However, it looks dishonest and is judged as such. The use of quotation marks around the original wording and citation avoid the problem of plagiarism. Often a better approach is to use paraphrase or to quote directly (with appropriate citations).

Plagiarism can be avoided by providing citations for the sources of any material, including ideas, phrases, or sentences that you have used in your paper. A number of different systems are available for providing citations. The key to all of them is that the writer must clearly identify for the reader the sources of all material (including ideas) that have come from somewhere else.



String Quotation Problem: Sometimes a student will write a paper consisting of a string of quotations. It is usually much better for a student to provide his or her own analysis and write the paper in his or her own words. Many professors will reject a paper consisting primarily of material quoted from other sources because they do not view such a paper as the student's own work. You should understand your professor's view with respect to string quotations prior to writing your paper.

The Stuart School of Business Student Etiquette Code

Students are expected to respect the following Code of Student Etiquette at all times:

- **No electronics.** You may not use **laptops, mobile phones, tablets**, or related devices in class **unless permitted to do so by the instructor.** It is distracting to your classmates to sit beside or behind you while you email, text, or browse social media.
- **Punctuality and Behavior.** Class will start on time. It is distracting to your classmates for you to be climbing to your seat and settling in while they are trying to pay attention to the lecture. Leaving then returning during class is disruptive and should occur only in emergencies. For class sessions longer than 1.5 hours, the instructor may allow a short bathroom/snack break in the middle.
- **Seating.** Your assigned seat for the semester will be the seat you choose for the second class session. I use assigned seats to help me keep track of class discussion, and also to have a place to direct prospective students and visitors to sit.
- **Beverages and Snacks.** You are welcome to bring something to drink to class. Please do not bring food and eat inside the classroom during a lecture.
- **Attendance and Class Participation.** Attendance, preparation, and participation are expected and represent an essential component of the learning experience. Class participation is evaluated based on the **quality of participation**, not its “quantity”. You should be prepared to provide insights, observations, inferences, or conclusions that not only express your viewpoint, but also defend your analysis. Your comments should be relevant to the topic at hand, and should advance the discussion. A simple opinion or viewpoint is not very valuable without any justification. Valuable comments respond to, elaborate on, lend support to, contradict, or correct a comment by one of your classmates. Counter-productive comments include opinions without a justifying argument, pure repetition of previous points, class interruptions that do not advance the discussion, and rambling, vacuous or disparaging comments.
- **Academic Integrity.** All students are expected to act with utmost civility and personal integrity; to respect other students’ dignity, rights and property; and to help create and maintain an environment in which all students can succeed through the fruits of their own efforts. Academic integrity includes a commitment to not engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty include cheating or copying, plagiarizing, submitting another persons’ work as one’s own, using sources without citation, having another student take your exam, tampering with the work of another student, and facilitating other students’ acts of academic dishonesty. Sanctions for breaches in academic integrity range from a fail grade in an assignment or test to a fail grade in the course, as well as severe disciplinary sanctions up to and including suspension or expulsion.

When interacting with fellow students in online discussions and in other web-enabled activities, students are further expected to respect the following **Online Code of Conduct** at all times:

- Do not dominate any discussion. Allow others the opportunity to join in the discussion.
- Do not use offensive language. Present your ideas appropriately.
- Be cautious in using Internet language. Do not capitalize all letters or rely heavily on acronyms.
- Avoid using vernacular and/or slang language. This could possibly lead to misinterpretation.
- Never make fun of someone’s ability to read or write.
- Share tips with other students.
- Keep an “open-mind” and be willing to express your opinion. Respect minority opinions.
- Reread your posting and edit before you push the “Send” button.
- Do not hesitate to ask for feedback.
- Using humor is acceptable. Do not use sarcasm as a form of humor – it is easily misinterpreted.

TENTATIVE Course Schedule

*(*HLC mandates student weekly “time on task”. Including lecture time, for a 3-credit course, it is 8.4 hours. Throughout the semester, readings below will be supplemented with news articles and other relevant materials. Additional worksheets will also be handed out throughout the semester. The class will meet for 2.5 hours every week. Class assignments and exams are expected to take about 3 hours every week over the course of the entire semester. It is expected that you will spend about 3 hours every week preparing for class by going over the suggested readings and video content.)*

Week 1: 21 August 2023 and 23 August 2023

Title: Syllabus and Introduction to Econometrics

Learning Objectives,

After studying this chapter, you will be able to:

- Define econometrics.
- Discuss the importance and relevance of studying econometrics.
- Explain how econometrics is different from economic theory, mathematical economics and economics statistics.
- Identify the steps involved in econometric analysis of an economic problem.
- Explain the difference between experimental and non-experimental data.

Relevant Readings:

- Chapter 1 of Stock & Watson
- Chapter 1 of Wooldridge

Week 2: 28 August 2023 and 30 August 2023

Title: Review of Probability and Statistics

Learning Objectives,

After studying this chapter, you will be able to:

- explain the basic elements of probability theory for a single random variable.
- explain the basic elements of probability theory for two random variables.
- exhibit familiarity with normal, chi-squared and F-distributions.
- discuss random sampling and the sampling distribution of the sample average.



Relevant Readings:

- Chapter 2 of Stock & Watson
- Appendix B of Wooldridge

4 September 2023: Labor Day – No Class

Week 3: 6 September 2023

Title: Review of Statistics

Learning Objectives,

After studying this chapter, you will be able to:

- explain the basic elements of statistical theory.
- understand the concepts of estimation, hypothesis testing, and confidence intervals as tools statistical inference.

Relevant Readings:

- Chapter 3 of Stock & Watson
- Appendix C of Wooldridge

HOMEWORK 1 due on BlackBoard at 6.00p.m on 10 September 2023 (Sunday)

Week 4: 11 September 2023 and 13 September 2023**Title: Linear Regression with One Regressor****Learning Objectives,**

After studying this chapter, you will be able to:

- define a linear regression model with one variable.
- derive the least square estimates of model parameters.
- interpret the OLS estimates.
- understand the algebraic properties of OLS estimates.

Relevant Readings:

- Chapter 4 of Stock & Watson
- Chapter 2 of Wooldridge

QUIZ 1: In class on 13 September 2023

Week 5: 18 September 2023 and 20 September 2023**Title: Linear Regression with One Regressor****Learning Objectives,**

After studying this chapter, you will be able to:

- measure the explanatory power of the estimated model.
- estimate the expected values and variances of the OLS estimates.
- estimate the expected values and variances of the OLS residuals.
- identify data requirements for estimation of a causal effect.

Relevant Readings:

- Chapter 4 of Stock & Watson
- Chapter 2 of Wooldridge

HOMEWORK 2 due on BlackBoard at 6.00p.m on 24 September 2023 (Sunday)

Week 6: 25 September 2023 and 27 September 2023**Title: Hypothesis Testing and Confidence Intervals****Learning Objectives,**

After studying this chapter, you will be able to:

- calculate standard errors of OLS estimates.
- use the OLS estimates and their standard error to construct t-statistic.
- use t-statistics for hypothesis testing.
- construct confidence intervals for OLS estimates.

Relevant Readings:

- Chapter 5 (Section 5.1 – 5.3) of Stock & Watson
 - Chapter 4 (Section 4.2) of Wooldridge
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Week 7: 2 October 2023 and 4 October 2023**Title: OLS Asymptotics and Homoskedasticity****Learning Objectives,**

After studying this chapter, you will be able to:

- explain the difference between heteroskedasticity and homoskedasticity.
- discuss the mathematical implication of homoskedasticity for OLS estimates.
- describe the asymptotic properties of OLS estimates (if schedule permits!).

Relevant Readings:

- Chapter 5 (Section 5.4) of Stock & Watson
- Chapter 5 of Wooldridge

Exam 1: In class on 4 October 2023

9 October 2023: Fall Break Day – No Class

Week 8: 11 October 2023**Title: Linear Regression with Multiple Regressors****Learning Objectives,**

After studying this chapter, you will be able to:

- understand the significance of multiple regression model.
- discuss the advantages of multiple regression model over linear regression model.
- derive the least square estimates of parameters in multiple regression model.
- describe the properties of OLS estimates in multiple regression model.
- understand the implications of including an irrelevant variable in the model.
- understand the implications of excluding a relevant variable from the model.
- define multicollinearity and explain its effect on variances of OLS estimates.

- Chapter 6 of Stock & Watson
- Chapter 3 of Wooldridge

HOMEWORK 3 due on BlackBoard at 6.00p.m on 15 October 2023 (Sunday)

Week 9: 16 October 2023 and 18 October 2023**Title: Hypothesis Tests and Confidence Intervals in Multiple Regression****Learning Objectives,**

After studying this chapter, you will be able to:

- apply methods of statistical inference to a multiple regression model.
- test hypothesis that involve two or more OLS estimates.
- construct confidence intervals for OLS estimates in multiple regression model.

Relevant Readings:

- Chapter 7 of Stock & Watson
- Chapter 4 (Section 4.3–4.5) of Wooldridge

QUIZ 2: In class on 18 October 2023

Week 10: 23 October 2023 and 23 October 2023**Title: Regression with a Binary Independent Variable****Learning Objectives,**

After studying this chapter, you will be able to:

- identify appropriate ways to describe qualitative information as dummy variable.
- estimate a linear regression model with one dummy variable.
- estimate a linear regression model with multiple dummy variable.
- apply methods of statistical inference to a regression model with dummy variable.

Relevant Readings:

- Chapter 7 (Section 7.1–7.4) of Wooldridge

HOMEWORK 4 due on BlackBoard at 6.00p.m on 29 October 2023 (Sunday)

Week 11: 30 October 2023 and 1 November 2023**Title: Regression with a Binary Dependent Variable****Learning Objectives,**

After studying this chapter, you will be able to:

- estimate a linear regression model with a binary dependent variable.
- apply methods of statistical inference to a linear probability model.
- discuss the limitations of linear probability model.
- specify logit and probit models for binary dependent variables.

Relevant Readings:

- Chapter 11 of Stock & Watson
- Chapter 7 (Section 7.5) of Wooldridge
- Chapter 17 (Section 17.1) of Wooldridge

QUIZ 3: In class on 1 November 2023

Week 12: 6 November 2023 and 8 November 2023**Title: Instrumental variables (IV) regression****Learning Objectives,**

After studying this chapter, you will be able to:

- explain the relevance of Instrumental Variables to for tackling omitted variable bias.
- discuss the properties of a good IV.
- estimate a regression model with IV.
- apply methods of statistical inference to a model with IV.
- explain the consequences of picking a poor IV.

Relevant Readings:

- Chapter 12 (Section 12.1) of Stock & Watson
- Chapter 15 (Section 15.1–15.2) of Wooldridge

HOMEWORK 5 due on BlackBoard at 6.00p.m on 12 November 2023 (Sunday)

Week 13: 13 November 2023 and 15 November 2023**Title: Instrumental variables (IV) regression****Learning Objectives,**

After studying this chapter, you will be able to:

- construct a two stage least squares (2SLS) estimator.
- estimate and interpret the co-coefficient after 2SLS estimation.
- test for endogeneity of an explanatory variable.
- discuss the consequences of heteroskedasticity for 2SLS estimates.

Relevant Readings:

- Chapter 12 (Section 12.2) of Stock & Watson
- Chapter 15 (Section 15.3–15.6) of Wooldridge

HOMEWORK 6 due on BlackBoard at 6.00p.m on 19 November 2023 (Sunday)



Week 14: 20 November 2019

Title: Prediction with Many Regressors and Big Data

Learning Objectives,

After studying this chapter, you will be able to:

- define “big data”.
- limitations of using OLS estimation with big data.
- describe the ridge regression estimator.

Relevant Readings:

- Chapter 14 of Stock & Watson

THANKSGIVING BREAK: 22 November 2023 – 26 November 2023

Week 15: 27 November 2023 and 29 November 2019

Title: Prediction with Many Regressors and Big Data; Final Review

Learning Objectives,

After studying this chapter, you will be able to:

- describe the Lasso estimator.
- conduct Principle Component Analysis (PCA).
- summarize and synthesize the course material

Week of 4 December 2023 – 9 December 2023 (FINAL EXAM WEEK)

**Project due on BlackBoard at 11.59p.m on 6 December 2023
(Wednesday)**

Final Exam at the time and location announced by the Registrar

Tentative Course Schedule At A Glance

Week	Topic	Relevant Readings
1	Introduction, Nature of Econometrics	Chapter 1 (SW), Chapter 1 (W)
2	Review of Probability and Statistics	Chapter 2 (SW), Appendix B (W)
3	Review of Statistics Homework 1 Due	Chapter 3 (SW), Appendix C (W)
4	Single Regression Model: Estimation Quiz 1 in class	Chapter 4 (SW), Chapter 2 (W)
5	Single Regression Model: Properties of estimates Homework 2 Due	Chapter 4 (SW), Chapter 2 (W)
6	Single Regression Model: Inference	Chapter 5 (SW), Chapter 4 (W)
7	OLS Asymptotics and Homoskedasticity Exam 1 in class	Chapter 5 (SW), Chapter 5 (W)
8	Multiple Regression Model: Estimation & Properties Homework 3 Due	Chapter 6 (SW), Chapter 3 (W)
9	Multiple Regression Model: Inference Quiz 2 in class	Chapter 7 (SW), Chapter 4 (W)
10	Regression with a Binary Independent Variable Homework 4 Due	Chapter 7 (W)
11	Regression with a Binary dependent Variable Quiz 3 in class	Chapter 11 (SW), Chapter 7 (W)
12	Instrumental Variable Regression: Estimation & Inference Homework 5 Due	Chapter 12 (SW), Chapter 15 (W)
13	Two-stage Least Squares (2SLS): Estimation & Inference Homework 6 Due	Chapter 12 (SW), Chapter 15 (W)
14	Prediction with Many Regressors and Big Data	Chapter 14 (SW)
15	Final Review	