Syllabus	
Course Information	ECON 345: Introduction to Econometrics Location: Distance Education/Blackboard
Instructor	Thomas Stratmann Email: tstratma@gmu.edu Virtual Office Hours: By appointment only You will find the online course here (log-in required): https://mymasonportal.gmu.edu/
Teaching Assistant	Amberly Bedi Email: adozier2@gmu.edu Virtual Office Hours Tuesdays, 11am-12pm via Zoom: https://gmu.zoom.us/j/3422571818?pwd=bWFORDlWSDljMEh1Mndxd3lkZEVYdz09
Course Description	This course will introduce you to multiple regression analysis and modern statistical techniques required to analyze data in the social sciences. The emphasis is on empirical applications. There are two main objectives of the course: 1. To provide you with the ability to analyze critically the empirical analysis done by others at a level sufficient to make sound decisions based on their analyses. 2. To provide you with the skills necessary to perform empirical analyses on your own.
Course Objectives	Upon completion of the course, students will be able to: 1. Describe the difference between correlation and causal effects 2. Interpret statistical information, making you an informed consumer of data 3. Demonstrate an ability to utilize appropriate statistical software (Microsoft Excel & Stata) to solve problems 4. Perform data analysis independently 5. Analyze critically the empirical analysis done by others at a level sufficient to make sound decisions based on their analyses 6. Construct appropriate outputs based on empirical analyses
Course Methodology	The class format will combine readings, lectures, quizzes, problem sets, and other learning tools. The class will be interactive and require every student to be engaged in the classroom discussion and assignments. In addition to the study of all lectures, screencasts, and reading materials, and the timely completion of assignments, every student will be expected to be an active participant and a dedicated individual, applying what they learn to every element of the course work.
Required textbook(s) and/or materials	**Required Textbook:** Jeffrey Wooldridge, *Introductory Econometrics: A Modern Approach*, 7th Edition, South-Western, Cengage Learning, 2020 (eBook or physical copy). via *Cengage MindTap* You must **purchase MindTap** for this course. It includes the eBook version of the required textbook: *Introductory Econometrics*. Buying a physical book will not reduce the cost of MindTap, so purchasing MindTap only will be the cheapest option. The software can be purchased using financial aids. Please consult the Cengage contact person below. You may

	buy MindTap access from the Mason bookstore or through Cengage. When you click on any link to MindTap from Blackboard, you will be prompted to enter an access code, and the page will display your purchasing options. If you have any questions, please reach out to Meredith Dudzik at meredith.dudzik@cengage.com. Other readings and materials will be made available electronically on Blackboard. **Required Software:** Stata/BE (formerly IC) or above (for more details, see "Course-specific Hardware/Software" below) Respondus LockDown Browser & Monitor (for more details, see "Course-specific Hardware/Software" below)
Computer Requirements	**Hardware:** You will need access to a Windows or Macintosh computer with at least 2 GB of RAM and access to a fast and reliable broadband internet connection (e.g., cable, DSL). A larger screen is recommended for better visibility of course material. You will need speakers or headphones to hear recorded content, and a headset with a microphone is recommended for the best experience. Finally, you are encouraged to have a webcam. For the amount of Hard Disk Space required for taking a distance education course, consider and allow for: 1. the storage amount needed to install any additional software and 2. space to store work that you will do for the course. If you are considering the purchase of a new computer, please go to Patriot Tech to see recommendations. **Software:** Many courses use Blackboard as the learning management system. You will need a browser and operating system compatible with the Blackboard version available on the myMason Portal. See supported browsers and operating systems. Log in to myMason to access your registered courses. Online courses typically use Acrobat Reader, Java, Windows Media Player, QuickTime, and Real Media Player. Your computer should be capable of running current versions of those applications. Also, make sure your computer is protected from viruses by downloading the latest Symantec Endpoint Protection/Anti-Virus software. Students owning Macs or Linux should know that some courses may use software that only runs on Windows. You can set up a Mac computer with Boot Camp or virtualization software, so Windows will also run on it. Watch this video about using Windows on a Mac. Computers running Linux can also be configured with virtualization software or configured to dual boot with Windows. Note: If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types. **Course-specific Hardware/Software** This course will learn applied computing, using Microsoft Excel and Stata. Stata software is probably the most favored statistical package used by applied economists. You will be required to utilize Stata/BE or above, available through the university virtual computing lab and for purchase. Here are some Mason links to Stata and ways of accessing Stata on Campus and off Campus, and purchasing options.

https://infoguides.gmu.edu/software/stata

https://its.gmu.edu/service/virtual-computing-lab/

https://its.gmu.edu/service/virtual-private-network-vpn/

To access Stata, go to https://its.gmu.edu/service/virtual-computing-lab/. This gets you to the virtual computing lab to access Stata. If you are off campus, you will have to use a VPN connection. Sometimes, even on campus, you'll need a VPN connection to access the virtual computing lab. For details on how to stall a VPN on your laptop or computer, go to https://its.gmu.edu/service/virtual-private-network-vpn/.

Alternatively, or in addition, you can get a six-month, annual, or perpetual license. The cheapest option is Stata/BE for students, which you can rent for six months for $48. A perpetual license costs Stata/BE costs $225, and you have options to upgrade to Stata/SE via additional payment later. Stata/SE allows for larger data sets, and there are flavors of Stata, such as Stata/MP, which are faster than the other two versions and allow for even larger data sets. You will find more details here: https://www.stata.com/order/new/edu/gradplans/student-pricing/.

Your instructor has no financial interest in what type of option you choose and whether you decide to purchase this software. The book *Statistics with Stata* by Lawrence C. Hamilton might be helpful for you to learn about using Stata, but this book is not required. A helpful reference developed by GMU may be found here: https://infoguides.gmu.edu/software/stata.

LockDown Browser + Webcam Requirement
This course requires using LockDown Browser and a webcam for online exams. The webcam can be the type that's built into your computer or one that plugs in with a USB cable.

Watch this brief video to get a basic understanding of LockDown Browser and the webcam feature.

https://www.respondus.com/products/lockdown-browser/student-movie.shtml

Download Instructions
Download and install LockDown Browser from this link:

https://download.respondus.com/lockdown/download.php?id=133435885

Once Installed

- Start LockDown Browser
- Log into Blackboard Learn
- Navigate to the test

Note: You won't be able to access tests with a standard web browser. If this is tried, an error message will indicate that the test requires the use of LockDown Browser. Simply start LockDown Browser and navigate back to the exam to continue.

Guidelines
When taking an online test, follow these guidelines:

- Ensure you're in a location where you won't be interrupted
- Turn off all other devices (e.g., tablets, phones, second computers) and place them outside of your reach
- Before starting the test, know how much time is available for it and also that you've allotted sufficient time to complete it

	• Clear your desk or workspace of all external materials not permitted - books, papers, other devices
	• Remain at your computer for the duration of the test
	• If the computer, Wi-Fi, or location is different than what was used previously with the "Webcam Check" and "System & Network Check" in LockDown Browser, rerun the checks before the exam
	• To produce a good webcam video, do the following:
	  ○ Avoid wearing baseball caps or hats with brims
	  ○ Ensure your computer or device is on a firm surface (a desk or table). Do NOT have the computer on your lap, a bed, or other surface where the device (or you) are likely to move
	  ○ If using a built-in webcam, avoid readjusting the tilt of the screen after the webcam setup is complete
	  ○ Take the exam in a well-lit room, but avoid backlighting (such as sitting with your back to a window)
	• Remember that LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted
	
	Getting Help
	Several resources are available if you encounter problems with LockDown Browser:
	
	• The Windows and Mac versions of LockDown Browser have a "Help Center" button located on the toolbar. Use the "System & Network Check" to troubleshoot issues. If an exam requires you to use a webcam, also run the "Webcam Check" from this area
	• Respondus has a Knowledge Base available from support.respondus.com. Select the "Knowledge Base" link and select "Respondus LockDown Browser" as the product. If your problem is with a webcam, select "Respondus Monitor" as your product
	• If you're still unable to resolve a technical issue with LockDown Browser, go to support.respondus.com and select "Submit a Ticket." Provide detailed information about your problem and what steps you took to resolve it
	• Quick Start Guide: https://web.respondus.com/wp-content/uploads/2019/08/RLDB-Quick-Start-Guide-Bb-Student.pdf
	
	Hardware or software required for your course or program may be available for purchase at Mason Bookstore(the University's bookstore that offers educational discounts and special deals for machineries).

Course Website	Blackboard will be used for this course. You can access the site at http://mymasonportal.gmu.edu. Log in and click on the "Courses" tab. You will see ECON 345. NOTE: Username and passwords are the same as your Mason email account. You must have consistent access to an internet connection to complete the assignments in this course through Blackboard (http://mymason.gmu.edu). Note the technology requirements for the College of Humanities and Social Sciences in your Blackboard course menu—it contains details of minimum technology requirements.
Participation	In this course, you will learn to use Microsoft Excel and Stata and solve statistical problems through learning-by-doing. In either case, your work must be your own. Thus, please don't hand in someone else's work product. Learning can only happen when you are playing an active role. Knowledge is more important than facts and definitions. It is a way of looking at the world, an ability to interpret and organize future information. An active learning approach will more likely result in long-term retention and better understanding because you make the content of what you are learning concrete and real in your mind. Although an active role can look different for various individuals, it is expected in this class that you will work to explore issues and ideas under the guidance of the professor and your peers. You can do this by reflecting on the content and activities of this course,

	asking questions, striving for answers, interpreting observations, and discussing issues with your peers.
Rules and Expectations	In correspondence/communication, students will be expected to: a) Be professional and respectful in correspondence b) Make reasonable requests of the instructor and the teaching assistant. We will be happy to clarify course material and answer legitimate questions; however, please exhaust other information sources (e.g., syllabus, Blackboard) to answer your question before contacting me. Remember, "Poor planning on your part does not constitute an emergency on my part." Regarding honesty in work, students will be expected to: a) Review the University integrity and honesty policies in the student handbook for guidelines regarding plagiarism and cheating (summarized below). I will gladly clarify my stance on any questionable or "grey area" issues you may have. b) Refrain from dishonest work. If not, that work will receive a minimum penalty of zero on the assignment and a maximum penalty of a zero for the course with a report to the Honor Committee. The GMU Honor Code requires that faculty submit any suspected Honor Code violations to the Honor Committee. Therefore, any suspected offense will be submitted for adjudication.
Mason Honor Code	**The complete Honor Code is as follows:** *To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code:* **Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.** *(From the Catalog – catalog.gmu.edu)*
Cheating Policy	Any form of cheating on an activity, project, or exam will earn zero points. "Cheating" includes, but is not limited to, the following: reviewing others' exam papers, having ANY resources utilized when not allowed, and collaborating with another student during an individual assignment. If you have questions about when the contributions of others to your work must be acknowledged and appropriate ways to cite those contributions, please talk with the professor or utilize the GMU writing center.
Plagiarism and the Internet	Copyright rules also apply to Internet users who cite from Internet sources. Information and graphics accessed electronically must also be cited, crediting the sources. This material includes but is not limited to e-mail (don't cite or forward someone else's e-mail without permission), newsgroup material, and information from Websites, including graphics. Even if you give credit, you must get permission from the original source to put any graphic you did not create on your web page. Shareware graphics are not free. Freeware clipart is available for you to use freely. If the material does not say "free," assume it is not. Putting someone else's Internet material on your web page is stealing intellectual property. Making links to a site is, at this time, okay, but getting permission is strongly advised since many Web sites have their requirements for linking to their material.
Individuals with Disabilities	Students with documented disabilities should contact the Disability Services (703) 993-2474) to open a file and learn more about accommodations that may be available to them. *(From the 2023-24 Catalog – catalog.gmu.edu)*
Academic Integrity and Inclusivity	This course embodies the perspective that we all have different views and ideas, and we each deserve the opportunity to share our thoughts. Therefore, we will conduct our discussions with respect for those differences. That means we each have the freedom to express our ideas. Still, we should also do so, keeping in mind that our colleagues deserve to hear differing thoughts respectfully, i.e., we may disagree without being disagreeable. http://oai.gmu.edu/

Student Privacy Policy	George Mason University strives to fully comply with FERPA by protecting the privacy of student records and judiciously evaluating requests for the release of information from those records. Please see George Mason University's student privacy policy https://registrar.gmu.edu/students/privacy/.
E-Mail Policy	http://masonlive.gmu.edu Mason uses electronic mail to provide official information to students. Examples include notices from the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their Mason e-mail account and are required to activate that account and check it regularly. Students are also expected to maintain an active and accurate mailing address to receive communications sent through the United States Postal Service. *(From the 2023-24 Catalog – catalog.gmu.edu)*
Late Work Policy	Late assignments will not be accepted without prior written approval from the instructor. Emergency, unforeseen, and extenuating severe circumstances will be handled case-by-case.
Course Grading & Evaluation	Grades will be assigned as follows: A: 93.00-100% A-: 89.50-92.99% B+:87.00-89.49% B:83.00-86.99% B-:80.00-82.99% C+:77.00-79.99% C:73.00-76.99% C-:70.00-72.99% D:60.00-69.99% F:0-59.99%
Discussions	The discussion board will primarily be used as an ongoing dialogue among students related to course materials and assignments. Through dialogue with your peers and instructor, regular participation is encouraged though you will not be graded. The exception will be during Lessons 1 and 10, where a specific topic will be presented, and discussions will be graded. **The "Ask the Instructor" section may be used for general questions and comments.**
Quizzes/Knowledge Checks – 15%	There will be a quiz to test your knowledge of the course syllabus, so please review it thoroughly before the first week of class. Brief knowledge check reviews are presented following videos within the course. You will have up to 3 opportunities to complete the knowledge checks, with the average score being counted. Each question counts for 1 point.
Assignments: Problem Sets, Homework, & Exercises– 35%	A variety of graded assignments will be presented throughout the course, including problem sets and MindTap homework/exercises. Correct answers to problem sets and reading assignments will be posted. Check Blackboard frequently for updates on problem sets, lecture notes, reading assignments, announcements, etc. You may work on the problem sets in small groups. You must, however, write up your answers individually and in your own words. If you choose to work in a small group, include the names of your study group members on your problem set. Duplicate answers will not receive credit. Each week assignments are required to be uploaded to Blackboard. Assignments are due by Sunday, 11:59 PM ET unless otherwise stated. Refer to the course schedule and weekly overviews for details.

Exams – 50% (Midterm 20%, Final 30%)	There will be one midterm exam. This exam is a closed book exam. There will be no makeup midterm. If you miss the midterm with a valid excuse, its weight will be shifted to the final. The final exam will be cumulative and is also a closed book. **Since both exams are closed books, Respondus LockDown Browser and Monitor are utilized to deter cheating. You will need to log into Respondus LockDown Browser using your Blackboard login information to access and complete these exams. A webcam is required when using Respondus Monitor.**
Need Help? Utilize the "Problem Sets & Solutions Discussion" board in the discussion forum or email your teaching assistant and/or instructor directly.	

Expect to work at least 8-10 hours per week on assignments and readings for this course. Those who are completely new to data analysis may need to spend more time in the earlier weeks, but it will decline as you get used to playing with data.

Unless otherwise stated, all assignments are due by the end of the week in which they are assigned. For this course, a week is defined as **beginning at 12:01 am each Monday EST** and **ending at 11:59 pm on the following Sunday EST.**

To help you manage your schedule and time to complete the assignments in this course, please follow the recommended timeline below. If you have a question or concern or encounter a problem with an assignment, please get in touch with us immediately so we can discuss and work out a resolution.

Weeks	Lessons	Assignments
Week 1	Lesson 1: Introduction to Excel and Stata	• Take a quiz on the content of the syllabus • Participate in the introductory discussion • Complete the MindTap tutorials (optional) • Watch the video "Isn't Econometrics Boring?" & Complete knowledge check • Review Microsoft Excel lecture • Review Stata lecture • Watch 3 Stata videos ("How to Use Stata", "Commands", & "Variables") & complete knowledge checks • Complete Excel assignment (problem set) • Complete Stata assignment (problem set)
Week 2	Lesson 2: Moving from Correlation to Causation	• Review Correlation & Covariance lecture • Watch 2 videos "What's the Difference Between Econometrics and Statistics?", "What's the Difference Between Econometrics and Data Science?" & Complete knowledge check • Read Wooldridge Chapter 1 • Complete 2 MindTap assignments (exercises and homework) • Complete Descriptive Statistics Problem Set • Participate in the Problem Set discussion
Week 3	Lesson 3: Laying the Groundwork for Future Proofs & Derivations	• Review Summation lecture • Read Wooldridge "Appendix A" • Complete Summations & Derivatives assignment (problem set) • Participate in the Problem Set discussion
Week 4	Lesson 4:	• Review OLS Derivations & Reading Results lecture & Complete knowledge check • Read Wooldridge Chapter 2 (Sections 2-1 to 2-4)

	The Simple Regression Model	• Complete MindTap assignment (homework) • Complete Stata assignment (problem set) • Participate in the Problem Set discussion
Week 5	Lesson 5: Unbiasedness and Variance of OLS Estimators	• Review Unbiasedness & Variance lecture • Read Sections 2-5 and 2-6 in Wooldridge Chapter 2 • Watch the video “Intro to Linear Regression” & complete the knowledge check • Watch the video “Interpreting the Regression Line” & complete the knowledge check • Watch the video “Outliers” & complete the knowledge check • Complete the Unbiasedness & Variance assignment (problem set) • Complete the Stata assignment (problem set) • Participate in the Problem Set discussion
Week 6	Lesson 6: Multiple Regression Model	• Review the Multiple Regression Model lecture • Read Wooldridge Chapter 3 • Watch the video "Intro to Understanding Data" & complete the knowledge check • Watch video "How to Read Economics Research Papers" & complete knowledge check • Complete the Multiple Regression Model assignment (problem set) • Complete the MindTap assignment (homework) • Participate in the Problem Set discussion • Complete the ungraded Practice Quiz in preparation for the Midterm Exam
Week 7	Lesson 7: Midterm Exam	• Complete the Midterm Exam
Week 8	Lesson 8: Regression, Matching, and Causality	• Review Regression, Matching, and Causality lecture notes • Read Angrist and Pischke Chapter 2 (PDF) • Watch the video "Ceteris Paribus” & complete the knowledge check • Watch the video “Selection Bias” & complete a knowledge check • Watch video (portion) “Mastering Mostly Harmless Econometrics.” • Complete the Matching and Causality assignment (problem set) • Participate in the Problem Set discussion
Week 9	Lesson 9: Statistical Inference	• Review the Statistical Inference lecture & complete knowledge check • Read Wooldridge Chapter 4 • Complete the Regression assignment (problem set) • Complete the MindTap assignment (homework) • Participate in the Problem Set discussion
Week 10	Lesson 10: Additional Regression Topics	• Review the Additional Regression Topics lecture & complete knowledge check • Read Wooldridge Chapter 6 • Complete 2 MindTap assignments (exercises and homework) • Participate in the Crime discussion (graded)

Week 11	Lesson 11: Binary Variables & Heteroskedasticity	• Review the Binary Variables lecture and the Heteroskedasticity lecture & complete knowledge check • Read Wooldridge Chapters 7 & Chapter 8 (Sections 8-1, 8-2 (excl. 8-2a), 8-4a) • Complete the 2 MindTap assignments (exercises and homework) • Complete the Heteroskedasticity problem set • Participate in the Problem Set discussion
Week 12	Lesson 12: Difference-in-Differences Estimation	• Review the Difference in Differences lecture • Read Wooldridge Chapter 13 • Watch the video “An intuitive introduction to Difference-in-Differences." • Watch video “Difference in Differences Estimation in Stata.” & complete knowledge check • Complete the Difference in Differences assignment (problem set) • Complete the MindTap assignment (homework) • Participate in the Problem Set discussion
Week 13	Lesson 13: Time Series (Part 1)	• Review the Time Series lecture & complete knowledge check • Read Wooldridge Chapter 10 • Complete the Time Series assignment (problem set) • Participate in the Problem Set discussion
Week 14	Lesson 14: Time Series (Part 2)	• Review the Time Series (Part 2) lecture • Read Wooldridge Chapters 11 and 18 (Sections 18.1-18.4) • Watch the video “What Is the Efficient Market Hypothesis?” & complete knowledge check • Complete the Time Series assignment (problem set) • Participate in the Problem Set discussion
Week 15	Lesson 15: Final Exam	• Complete the Final Exam