

# Syllabus

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## Course Information

Econometrics (Econ 322:H7, 3 cr.)

Summer 2020 (7/7/19–8/11/19)

Tuesdays/Thursdays 1:00 p.m. to 5:00 p.m. (EST)

Webex

## Instructor Information

Jesse Neumann

[jn495@economics.rutgers.edu](mailto:jn495@economics.rutgers.edu)

Office Hours: Wednesdays 1:00 p.m. to 2:00 p.m. or by appointment

I will be in my Webex meeting room during my office hours which can be accessed using the same link used to access the room for class.

## Prerequisites

- Intro to Microeconomics (Econ 102) with a grade of C or higher
- Intro to Macroeconomics (Econ 103) with a grade of C or higher
- Calculus I (Math 135 or Math 151) with a grade of C or higher
- Statistics (Stats 285 or Stats 211) with a grade of C or higher

## Textbook + MyLab Economics

1. *Introduction to Econometrics*, 4th ed. by James H. Stock and Mark W. Watson

Copyright © 2019 by Pearson Education, Inc.

2. MyLab Economics (subscription)

The book comes in several forms: electronic version, loose-leaf version, or hardcover. The electronic version will be the cheapest. There are also a number of options for where to purchase the textbook including:

- [MyPearsonStore.com](http://MyPearsonStore.com) for both the MyLab Economics subscription and the textbook
- [rutgers.bncollege.com](http://rutgers.bncollege.com)
- A third-party service such as Amazon.com.

Wherever you get the book make sure the MyLab Economics subscription comes with it or purchase the subscription separately.

## MyLab Economics (homework, sample tests, and e-book/eText)

You will use MyLab Economics to complete homework assignments.

You may also use it to read the electronic textbook and to take sample tests.

To register for MyLab Economics, ...

1. Visit [www.pearson.com/mylab](http://www.pearson.com/mylab).
2. Under Register, select Student.
3. If you already have an access code, you will redeem it when you register. If you do not, you can use a credit card or PayPal to purchase access. Select OK! Register now.
4. Enter the course ID, which is *neumann03668*, and select Continue.

5. If you already have a Pearson account, sign in with your username and password. If not, select Create and complete the required fields.
6. Select an access option:
  - a. Enter the access code that came with your textbook or that you purchased separately from the bookstore.
  - b. Buy access using a credit card or PayPal.
  - c. Get temporary access.
7. From the You're Done! page, select Go To My Courses.
8. On the My Courses page, select **Econometrics Summer 2020**.
9. Start your work.

To sign into MyLab Economics after you register, ...

1. Visit [www.pearson.com/mylab](http://www.pearson.com/mylab).
2. Sign in with your (Pearson account) username and password.
3. Select **Econometrics Summer 2020**.
4. Start your work.

To upgrade temporary access to full access, ...

1. Visit [www.pearson.com/mylab](http://www.pearson.com/mylab).
2. Sign in with your (Pearson account) username and password.
3. Select Upgrade access for **Econometrics Summer 2020**.
4. Enter an access code or buy access with a credit card or PayPal.

**You may need to uncheck “block pop-up windows” and enable cookies when using MyLab Economics.**

**Sakai** (course management system)

I use Sakai to make announcements and to post instructions, data sets, solutions, and grades. You will upload your data exercises and a small number of homework assignments to Sakai. Quizzes and the final exam will also be posted and must be submitted to Sakai.

To access the Sakai site for this course ...

1. Visit [sakai.rutgers.edu](http://sakai.rutgers.edu).
2. Log in with your NetID and password.
3. Select Membership.
4. Select ECONOMETRICS H7 Su20.

Alternatively, here is a direct link to the Sakai site for this course:

<https://sakai.rutgers.edu/portal/site/c225dde6-bd0e-40a8-afb7-a47b30f34f3e>

**R** (programming language for statistical computing and data visualization)

There are four data exercises.

You may complete them using any statistical software (e.g., Stata, SAS, SPSS, or Eviews).

However, I encourage you to use R: I will provide download instructions, in-class tutorials, and tips and tricks for R; moreover, R is free.

You will need to download and install R first and then RStudio.

RStudio is an integrated development environment (IDE) for R.

To download R, ...

1. Visit [cran.rstudio.com](https://cran.rstudio.com).
2. Click on Download R for Linux, Download for (Mac) OS X, or Download R for Windows, depending on your operating system.
3. If you are running OS X 10.11 (El Capitan) or higher, then proceed by clicking on R-3.6.0.pkg.

To download RStudio, ...

1. Visit [rstudio.com/products/rstudio/download](https://rstudio.com/products/rstudio/download).
2. Scroll down to Installers for Supported Platforms, and click on the appropriate installer.
3. If you are running OS X 10.11 (El Capitan) or lower, you will need to download an older version of RStudio.

## **Course Description**

This course presents an introduction to the application of statistical methods for the estimation, testing, and prediction of economic relationships. It emphasizes ordinary least squares regression and introduces some downsides to its application. Special topics include limited (binary) dependent variables models, simultaneous equation methods and an introduction to machine learning, if time allows. Extensive work hands on work with data is undertaken and skills to implement the methods learned in this course are developed.

## **Learning Outcomes**

Students who successfully complete this course will ...

- be comfortable with basic probability and statistics
- be able to estimate and interpret linear regression models and distinguish between economic and statistical significance
- be able to use a statistical/econometric computer packages to estimate an econometric model and report the results of their work in both a nontechnical and technical manner
- be able to critique reported regression results in applied academic papers and interpret the results for someone who is not trained as an economist

## **Important Note and Dates**

This is a required course for the economics major.

Students majoring in economics must get a C or better to maintain good academic standing.

The drop/add period is from July 6 to July 8.

If you drop this course and replace it with another 3-cr. course, this course will not appear on your transcript; if you drop this course and do not replace it with another 3-cr. course, you will receive a "W" grade and a 50% refund. Add/drop must be done by the Registrar's Office.

## **Academic Integrity**

All incidents of cheating will be reported to the economics department's undergraduate program director. Here are some examples of cheating:

- copying another student's answers during an exam
- using prohibited devices or referencing prohibited materials during an exam (e.g., cell phones and books)
- storing notes in a calculator for use during an exam
- acquiring a version of the exam from an unauthorized source
- having someone else take the exam for you
- sharing homework answers with another student who didn't work with you on the assignment

The undergraduate program director may report the incident to the Office of Student Conduct and Academic Integrity. Sanctions for separable violations include:

- a grade of XF (disciplinary F) for the course
- disciplinary probation
- denial of access to internships or research programs
- suspension for one or more semesters
- permanent expulsion from the university with a permanent notation on the student's transcript

The university policy and disciplinary process can be found at [academicintegrity.rutgers.edu](http://academicintegrity.rutgers.edu).

## Additional Readings

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- Introduction to Econometrics with R (*Christoph Hanck, Martin Arnold, Alexander Gerber and Martin Schmelzer*). Available Online: <https://www.econometrics-with-r.org/>
- R Packages: Organize, Test, Document and Share Your Code (*Hadley Wickham*). Available Online: <https://r-pkgs.org/index.html>
- Fama, Eugene; French, Kenneth. "Choosing Factors". *Journal of Financial Economics*. Vol 128. Issue 2 (2018). Pp. 234 – 252.
- Goldin, Claudia D. "The Political Economy of Immigration Restriction in the United States, 1890-1921." In The Regulated Economy : A Historical Approach to Political Economy, edited by C.Goldin and G. D. Libecap. Chicago: University of Chicago Press, 1994. [NBER version: <http://www.nber.org/papers/w4345.pdf>
- Dichev, Ilia. "Is the Risk of Bankruptcy a Systemic Risk?" *The Journal of Finance*. Vol 13. No 3 (1998). Pp 1131 – 1147.
- Aigner, D.J.; Heins. "On the Determinants of Income Inequality". *The American Economic Review*. Vol 57. No 1 (1967). Pp 175 – 184.
- Capozza, Dennis; Hendershott, Patric; Mack, Charlotte; Mayer, Christopher. "Determinants of Real House Price Dynamics". *National Bureau of Economic Research*. NBER Working Paper No. 9262. Available online: <https://www.nber.org/papers/w9262.pdf>

## Course Assessment

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### Homework

There are 10 homework assignments. 9 are to be done through MyLab Economics and the last will be done by hand and submitted to Sakai > assignments. To give you every chance to meaningfully complete the assignment, each assignment is due 11:59 p.m. on the day it is due (that is after class in case you learn something that day which will help, although that should not be necessary).

Homework 1 is due on Thursday, 7/9

Homework 2 is due on Tuesday, 7/14

Homework 3 is due on Tuesday 7/16

Homework 4 is due on Thursday, 7/21

Homework 5 is due on Tuesday, 7/23

Homework 6 is due on Thursday, 7/28

Homework 7 is due on Tuesday, 7/30

Homework 8 is due on Thursday, 8/4

Homework 9 is due on Tuesday, 8/6

Homework 10 is due on Thursday, 8/11

Homework is worth 20% of your grade, meaning each assignment is worth 2% of your grade. I will drop the lowest score. Accordingly, I will not allow any makeups.

Get Started Homework: There is one additional MyLab Economics homework (called “Get Started Homework” on MyLab Economics), the purpose of which is simply to teach you how to use MyLab Economics to answer the various types of questions you will encounter throughout the course (i.e. multiple choice, numerical, graphical, etc.). You are required to complete this assignment to ensure you know how to answer the homework questions throughout the class.

### Data Exercises

There are four data exercises. These exercises are designed to apply the knowledge you have learned in class to real world data and to help develop your programming skills which are essential to applying econometric concepts in your academic and professional lives. Like the homework, the data exercises will be due at 11:59 p.m. to allow you time to apply anything you learn in class that day to the data exercises, although that should not be necessary.

Data exercise 1 is due on Tuesday 7/14

Data exercise 2 is due on Tuesday 7/21

Data exercise 3 is due on Tuesday 7/28

Data exercise 4 is due on Tuesday 8/4

You will upload your data exercises to Sakai > Assignments.

The data exercises are worth 20% of your grade, meaning each assignment is worth 5% of your grade. I will drop the lowest score. Accordingly, I will not allow any makeups.

### **Quizzes**

There are five quizzes which will be given everything Thursday at the beginning of class.

Quiz 1 will be administered on Thursday 7/9 at 1:10 p.m.

Quiz 2 will be administered on Thursday 7/16 at 1:10 p.m.

Quiz 3 will be administered on Thursday 7/23 at 1:10 p.m.

Quiz 4 will be administered on Thursday 7/30 at 1:10 p.m.

Quiz 5 will be administered on Thursday 8/6 at 1:10 p.m.

You will have 45 minutes to complete each quiz and we have will our regular class after the quizzes. Quizzes are worth 30% of your grade, meaning each quiz is worth 6% of your grade. I will drop the lowest score. Accordingly, I will not allow makeups.

### **Final**

The final will be during our regular class period on the last day of class, 8/11. The final will take half of the class period, from 1:10 p.m. to 3:10 p.m. It will be a cumulative final and will be worth 30% of your grade. If you cannot attend class to take the final on the given date you need to tell me before the second week of class or you will not be accommodated.

## Attendance

Attendance, while not mandatory, is highly encouraged. You are all paying for this course and as adults can decide whether to attend lectures or not. However, students who attend every lecture, ask questions, and go to office hours on a weekly basis tend to perform better in the class than students who don't.

## Letter Grades

I assign letter grades according to the following cutoffs:

| Grade | Range      |
|-------|------------|
| A     | 90% - 100% |
| B+    | 87% - 89%  |
| B     | 80% - 86%  |
| C+    | 77% - 79%  |
| C     | 70% - 76%  |
| D     | 60% - 69%  |
| F     | < 60%      |

With the following component weights:

| Component      | Weight |
|----------------|--------|
| Homework       | 20%    |
| Data Exercises | 20%    |
| Quizzes        | 30%    |
| Final Exam     | 30%    |

## Calendar

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| <b>Week 1</b>   | <b>Assignment</b> | <b>Reading</b> | <b>Topic</b>                       |
|-----------------|-------------------|----------------|------------------------------------|
| (01) Tue., 7/7  | HW1, DE1          | §1.1–§3.7      | Review of Probability & Statistics |
| (02) Thu., 7/9  | Quiz1, HW2        | §4             | Simple linear regression           |
| <b>Week 2</b>   | <b>Assignment</b> | <b>Reading</b> | <b>Topic</b>                       |
| (03) Tue., 7/14 | HW3, DE2          | §5             | Simple linear regression           |
| (04) Thu., 7/16 | Quiz2, HW4        | §6             | Multiple linear regression         |
| <b>Week 3</b>   | <b>Assignment</b> | <b>Reading</b> | <b>Topic</b>                       |
| (05) Tue., 7/21 | HW5, DE3          | §7             | Multiple linear regression         |
| (06) Thu., 7/23 | Quiz3, HW6        | §8             | Nonlinear regression               |
| <b>Week 4</b>   | <b>Assignment</b> | <b>Reading</b> | <b>Topic</b>                       |
| (07) Tue., 7/28 | HW7, DE4          | §9             | Internal and external validity     |
| (08) Thu., 7/30 | Quiz4, HW8        | §10            | Panel data regression              |
| <b>Week 5</b>   | <b>Assignment</b> | <b>Reading</b> | <b>Topic</b>                       |
| (09) Tue., 8/4  | HW9               | §11            | Binary dependent variable          |
| (10) Thu., 8/6  | Quiz5, HW10       | §12            | Instrumental variables             |
| <b>Week 6</b>   | <b>Assignment</b> | <b>Reading</b> | <b>Topic</b>                       |
| (11) Tue., 8/11 | Final Exam        | §14            | Intro to machine learning          |

HW = Homework

DE = Data Exercise

## Resources for Health & Wellness on Campus

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### Medical Services

The Hurtado Health Center on the College Avenue Campus is open, but with limited staff and hours. The hours of operation are Monday through Friday, 8:30 a.m. to 5:00 p.m.

- All regular services, such as physicals, sexual and reproductive health, and management of acute and chronic conditions, continue to be available. For a full list of services, visit [health.rutgers.edu/medical](http://health.rutgers.edu/medical).
- Most services are provided via phone consultations and telehealth video visits. Limited in-person appointments are also available when deemed necessary. The laboratory is open when blood work is required.
- Use of the Patient Portal to schedule appointments at Hurtado is currently suspended. To schedule an appointment, call 848-932-7402.
- Please note: Calls from Student Health may appear as a blocked number, so please set your phone to allow blocked numbers and set up your voicemail to allow for messages.

### Experiencing Fever or Respiratory Symptoms?

Regardless of whether you use Rutgers Student Health or another healthcare provider, if you experience symptoms of COVID-19 (coughing, fever, shortness of breath), or feel you've been exposed, make sure to call your healthcare provider for consultation. Do not just show up to your provider's office.

### Counseling, Alcohol & Other Drug Assistance Programs and Psychiatric Services (CAPS)

Although all CAPS locations are physically closed, services are available remotely via phone consultations and telehealth video visits. Services include counseling, Let's Talk, and soon group sessions.

- Use of the Patient Portal to schedule appointments with CAPS is currently suspended. To schedule an appointment, call 848-932-7884 and leave a voicemail with your full name, phone number, and RUID. Your message will be returned within one hour during regular business hours.
- Please note: CAPS will return your call from a blocked number, so please set your phone to allow blocked numbers and set up your voicemail to allow for messages.
- Check your Rutgers Portal for messages from CAPS staff.
- ProtoCall, a phone-based service for students in crisis when CAPS is closed will continue to be available. Call the main CAPS number, 848-932-7884, and follow the prompts.
- CAPS also offers virtual workshops on topics such as mindfulness meditation, yoga, and “Coping with COVID-19 Stress” on a drop-in basis with no sign-up required! Find a list of offerings at [health.rutgers.edu/virtual-resources](http://health.rutgers.edu/virtual-resources).

An additional resource is the Rutgers Graduate School of Applied and Professional Psychology (GSAPP). Information can be found at [gsapp.rutgers.edu/gsapp-guidelines-for-covid-19/mental-health-support](http://gsapp.rutgers.edu/gsapp-guidelines-for-covid-19/mental-health-support).

### **Health Outreach, Promotion, and Education (HOPE)**

HOPE is creating a variety of workshops and videos for release in mid-April. HOPE's physical office is closed.

- Live mini health and wellness workshops and quick-tip videos will be available on emotional wellness, alcohol, and other drugs and sexual and reproductive health.
- Offerings will be listed at [health.rutgers.edu/virtual-resources](http://health.rutgers.edu/virtual-resources).

Stay connected with Student Health (Medical, CAPS, and HOPE) on social media: @RUStrudentHealth on Facebook, Twitter, and Instagram. Find more information at [health.rutgers.edu/RSH-operating-status](http://health.rutgers.edu/RSH-operating-status).

### **Office for Violence Prevention and Victim Assistance (VPVA)**

Although VPVA's physical office is closed, the hotline, 848-932-1181, remains operational and will continue to provide 24/7 crisis response for anyone in the Rutgers community who needs it. Counseling and advocacy services are being offered by phone. Stay connected with VPVA on social media: @RUVpva on Facebook and Instagram and @RU\_VPVA on Twitter. Find more information at [vpva.rutgers.edu/vpva-operating-status](http://vpva.rutgers.edu/vpva-operating-status).

### **Recreation**

All recreation locations are physically closed but services are being provided remotely. Virtual programs and services include ....

- Free on-demand and live fitness and wellness classes including yoga, Pilates, RU Fit-30, Bodycombat®, and GRIT®
- Free six-week virtual walking/running challenge
- Free one-on-one Skype appointments with an Exercise Is Medicine® coach
- Online personal training
- Rutgers students may also participate in the National 2020 Recreation Movement with 40 other universities
- eSports and virtual trivia

Find more information on the Rutgers RURec2Go app, available from the App Store, and at [recreation.rutgers.edu/status](http://recreation.rutgers.edu/status). Stay connected with recreation on social media: @RURec on Facebook, Twitter, and Instagram.

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### **Office of Disability Services (ODS)**

Reach out to ODS if you have a disability and require special accommodations (e.g., extra time on exams). To make general inquiries, call 848-202-3111 or email [dsoffice@echo.rutgers.edu](mailto:dsoffice@echo.rutgers.edu). For more information, visit [ods.rutgers.edu](http://ods.rutgers.edu).

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