Course Description: This course is an introduction to statistics specially designed to address economic and other social science phenomena, such as unemployment, poverty, discrimination, inflation, economic growth, and inequality. Basic elements of probability and sampling theory, statistical estimation, regression analysis, and hypotheses testing are emphasized. Students will use elementary econometrics and other applications of statistical tools to assess economic data and will learn to make statistical calculations. The course provides a solid foundation in statistics for economists and other social scientists.

Throughout the semester, students will learn to collect, organize, and model data using mathematical programming skills in the language R.

Prerequisite: ENG 101, and ECO 105, and MAT 108 or MAT 141 or MAT 241 or MAT 242 or higher (or permission of the instructor)

Note: A minimum grade of C is required in this course to progress to ECO 320.

Credit Hours: 3

Text: OpenIntro Statistics, 3rd Edition

Course Objectives:
At the completion of this course, students will:

1. Understand basic principles of data collection and research design
2. Use the statistical programming language R (more specifically RStudio) to load data, create statistical models, and visualize results
3. Have a solid grasp of the intuitive foundations of statistical inference as preparation for further training
4. Be able to model numerical response variables using single or multiple explanatory variables

Grade Distribution:
Participation and Discussion Board (see below) 33%
Lab Reports 33%
HW Assignments 34%
Letter Grade Distribution:

- >= 93.00 A 73.00 - 76.99 C
- 90.00 - 92.99 A- 70.00 - 72.99 C-
- 87.00 - 89.99 B+ 67.00 - 69.99 D+
- 83.00 - 86.99 B 63.00 - 66.99 D
- 80.00 - 82.99 B- 60.00 - 62.99 D-
- 77.00 - 79.99 C+ <= 59.99 F

Course Policies:

General
- Readings should be completed before the associated lecture.
- In addition, there are a variety of additional resources ranging from alternative textbooks to entire video lecture series and everything in between. I highly suggest taking advantage of as many of these additional resources as possible. It will invariably help with your progress in the course.
- This course may be difficult for some - it is a robust introduction to statistics and statistical programming all at once. That said, evaluation is based in large part on the level of your engagement and somewhat less on your ability to solve puzzles on tests. I can say to a near certainty that if you participate thoroughly throughout the course and take advantage of the additional materials provided to you, you will do fine.

Zoom Meetings
- I will be holding Zoom sessions once a week. For section one: 12:15pm; for section two: 5:55pm. You are not required to attend, although participation is highly recommended.

Labs and Assignments
- Problem Sets for individual chapters (not lab reports) are to be completed individually. Discussion among students regarding all course materials including assignment questions is highly encouraged. However, offering or accepting assignment solutions wholesale is an act of plagiarism, which is a serious academic offense and all involved parties will be penalized according to the Academic Integrity Policy. More to the point - it is simply a waste of everyone's time. Each student should submit their own answers to every question. If there is any ambiguity about the difference between copying work and learning from another student, please review John Jay's academic integrity policy or email me.
- All lab reports will be submitted in R Markdown, a simple formatting syntax in R Studio that allows easy incorporation of R code, figures, and text.
- Assignments are due on Blackboard and may receive a 10 percent reduction in grade each day past due. For both Lab Reports and individual assignments grading will be mainly based upon level of engagement. Where applicable, you must show your work! The more work you show, even simply explaining your thinking, the more likely you will receive full marks even if individual answers are incorrect.
- We will not have a midterm or final. You will be graded on how well you complete the assignments and labs, and how well you correct any work that was marked incorrect when you are given the time to correct your work and/or resubmit assignments (week 8).

Problem Set Ch Assignments
- TBA on Blackboard
Group Lab Reports (titled by associated Ch)
- Lab 0A - Introduction to R
- Lab 0B - Downloading and Viewing Data
- Lab 1 - Introduction to Data
- Lab 2 – Probability
- Lab 3 - The Normal Distribution
- Lab 4A- Intro to Inference
- Lab 4B - Confidence Levels
- Lab 5 - Inference for Numerical Variables
- Lab 7 - Linear Regression

Attendance and Absences
- Attendance for the Zoom sessions is highly recommended but not required so as to avoid punishing those of you that work better asynchronously.
- Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

Tips for Success
- Always read the material assigned, and more than once if possible. It may also be helpful to review the supplemental material so you are more prepared for the upcoming assignments. Even skimming helps you be a more active participant in lecture!
- Take written notes! Even if it is simply scratching out some ideas or questions as you read or participate in Zoom meetings. Research demonstrates that active listening helps many students retain information.
- Collaborate and discuss with your peers! This is one of the great opportunities of university education - be sure to use it to your advantage. Also, be sure to schedule meetings during office hours, even if just to chat about your ideas and interests.

Why R?
- Though this course provides a gentle introduction, learning to code for the first time can be difficult. It certainly was for me. However, the effort should be worthwhile as it fulfills an important general education objective and will prepare you to understand other platforms and applications more quickly.
- Switching around programming languages can also be a costly waste of time for students. R is open source, has among the largest community of developers and sources of coding assistance online, and can be used for methods all the way to the current state-of-the-art. R is also widely considered to be excellent for data visualization.
- All required programs should be installed on your classroom computers. For your own computers you will need to install R and R Studio (a standard graphical interface for R). Please follow this simple guide.

Discussion Board/Participation
- Teaching and learning online poses certain obstacles that are not present in an in-person setting. When one student would ask a question that six other students were thinking of, an answer to that question appeases all of the other students that had the same question. Teaching online, and asynchronously, takes away this luxury.
- In order to help facilitate both answers to any questions concerning the material as well as a
general classroom dialogue we will utilize Blackboard’s Discussion Board section. *When you have
a question, post it under the Discussion Board section of Blackboard.* Other students that know
the answer or may have a comment to add will then help you. *This does not include any
questions to the HW and/or lab assignments unless I give explicit permission to do so.* I will
moderate the Discussion Board and intervene to either correct any mistakes, clarify any further
questions, or to confirm that the answers provided are indeed correct.

- **Participation in the Discussion Board is required.** Invariably, everyone will come across material
that they do not understand. Likewise, everyone will find that they can help a fellow student by
answering questions. There is no fixed rule as to how many questions and answers you should
provide. It will vary from student to student, but I recommend staying active and involved via
the Discussion Board.

**Students with Disabilities**

- Under the Americans with Disabilities Act and Section 504 of the Vocational Rehabilitation Act
of 1973, all students, with or without disabilities, are legally entitled to equal access to the
programs and activities. If you believe that you have a disability that may interfere with your
ability to participate in the activities, coursework, assessment, or any other aspect of this
course, you may be entitled to accommodations.

- Please schedule a meeting to speak with someone at Support Services
  [http://www.jjay.cuny.edu/staff-directory-2](http://www.jjay.cuny.edu/staff-directory-2). For more info check

*In addition to the assigned chapters there will be supplemental readings, videos, and various other
resources at your disposal. I will inform you when they become available and where to access them.*

**Eco-255 “Statistics for Economists” Schedule**

**Spring 2021: 1/27/2021 – 5/22/2021**

<table>
<thead>
<tr>
<th>Week dates</th>
<th>Course Material</th>
<th>Discuss</th>
<th>Assignments</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 1/27-1/29</td>
<td>Introduction Chapter 1</td>
<td>Introductions</td>
<td>• Introducing yourselves</td>
<td>1/29</td>
</tr>
<tr>
<td>Week 2 2/1-2/5</td>
<td>Ch 1 (cont.)</td>
<td>Intro to Data</td>
<td>• Questions on Ch 1</td>
<td>2/5</td>
</tr>
<tr>
<td>Week 3 2/8-2/12</td>
<td>Lab 0, Lab 1</td>
<td>Intro to R</td>
<td>• Lab0 &amp; Lab 1</td>
<td>2/12</td>
</tr>
<tr>
<td>Week 4 2/15-2/19</td>
<td>Ch 2: Probability</td>
<td>Probability</td>
<td>• Ques on Ch 2</td>
<td>1/19</td>
</tr>
<tr>
<td>Week 5 2/22-2/26</td>
<td>Prob. (cont.), Lab 2</td>
<td>Probability in R</td>
<td>• Lab 2</td>
<td>2/26</td>
</tr>
<tr>
<td>Week 6 3/1-3/5</td>
<td>Ch 3: Distributions</td>
<td>The Normal Distribution</td>
<td>• Ques on normal dist.</td>
<td>3/5</td>
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<tr>
<td>Week 7 3/6-3/12</td>
<td>Ch 3 (cont.)</td>
<td>More Distributions</td>
<td>• Ques on Ch 3 (cont.)</td>
<td>3/12</td>
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<tr>
<td>Week 8</td>
<td>Catch-up</td>
<td>Complete Missing HW</td>
<td>• All incomplete/make-ups</td>
<td>3/18</td>
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<tr>
<th>Week 9</th>
<th>Ch 4: Intro to Inference</th>
<th>Difference b/t Descriptive vs Inferential Statistics</th>
<th>• Point estimates, Variability, and Confidence Intervals</th>
<th>4/2</th>
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<tbody>
<tr>
<td>3/29-4/2</td>
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<tr>
<th>Week 10</th>
<th>Ch 4 (cont.)</th>
<th>Hypothesis Testing</th>
<th>• Hypothesis Testing, Central Limit Theorem, and Law of Large Numbers</th>
<th>4/9</th>
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<tbody>
<tr>
<td>4/5-4/9</td>
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<tr>
<th>Week 11</th>
<th>Lab 4A, Lab 4B</th>
<th>Working with samples in R</th>
<th>• Intro to Inference and Confidence Levels</th>
<th>4/16</th>
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<td>4/12-4/16</td>
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<tr>
<th>Week 12</th>
<th>Ch 5: Inference for Numerical Variables, Lab 5</th>
<th>Numerical Inference in R</th>
<th>• Lab 5</th>
<th>4/23</th>
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<tr>
<th>Week 13</th>
<th>Ch 6: Inference for Categorical Variables</th>
<th>Categorical Inference in R</th>
<th>• Lab 6</th>
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<tr>
<th>Week 14</th>
<th>Ch 7: Linear Regression</th>
<th>Linear Regression</th>
<th>• Ques on Ch 7</th>
<th>5/7</th>
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<tbody>
<tr>
<td>5/3-5/7</td>
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