December 1, 2021

Syllabus

ECON1151.03 – Statistics
Term: Fall 2021

Schedule:	MW 8:30 – 9:45am (EST)	Instructor:	Carter Bryson
Location:	O'Neill (Library) 247	Email:	brysonwa@bc.edu
Format:	In Person, Synchronous	Office:	Maloney 340B
Section:	03		(Dept. of Economics, 3rd floor)
		Office Hours:	M 3:00 – 5:00pm
			W 3:00 – 5:00pm
			Also by appointment.
			(Zoom/In-Person)

Course Description
The following information is provided on EagleApps:

> **ECON1151 Statistics**
> This course is focused on probability, random variables, sampling distributions, estimation of parameters, tests of hypotheses, regression, and forecasting.
>
> Prerequisite: Open to all freshmen. Open to sophomore and junior ECON majors and minors only.

Course Overview
This is a course in statistics. Statistics are present everywhere we look, increasingly so in the modern world in which we constantly encounter data from various sources and are asked to digest complex bits of information of varying quality. Understanding statistics is crucial for economists, policymakers, business people, and scientists; it is also essential in your role as a responsible consumer of news, politics, and popular culture. This class will enable you to make sense of the information that comes from statistics and will help you communicate that information in a clear and precise manner. It will provide you with frameworks for thinking about data as well as the tools to analyze them yourself.

Statistics is a branch of mathematics. This course will require the use of technical notation as well as mathematical formulas and reasoning. However, as an economics student, you are expected to also develop "statistical intuition," so we will focus on real life applications of the methods that we cover in class. By the end of the semester, you should be able to explain in plain language the statistical concepts you learn in class and use them to understand real world phenomena and other problems that interest you.

Textbook
The textbook for this course is: *Statistics for Business and Economics* (8th edition), by Newbold, Carlson, and Thorne.

Two versions of the textbook are available:

1. Full version (8th edition)
2. Custom version (8th edition) for ECON1151 (cheaper option)

Both versions are available at the Boston College Bookstore. They also may be ordered online from a third party (new or used). The textbook is *not required* for the course, but it is *strongly recommended*. The course follows the text very closely and it will be beneficial to follow along with the recommended readings.

- My suggestion: Buy the *custom edition* from the bookstore.
- Rationale: Cheaper; easier to follow along with course material.

Should you have trouble purchasing the book, the O'Neill Library has a limited number of copies available for check out. Please let me know by the end of the first week of class if you have any problems obtaining the book.

Grading
Your final grade for this class will be determined according to the following criteria:

Statistics Lab	15%
Problem Sets	20%
Midterm Exam 1	15%
Midterm Exam 2	15%
Final Exam	35%

Statistics Lab
You are *required* to enroll in a discussion section of ECON1151: the companion lab to ECON1151 (look for section 05 and higher on EagleApps). The lab work and assignments you complete in the statistics lab will be incorporated into your final course grade. In the lab, you will learn how to use the statistical software package Stata and apply the concepts learned in lecture. Details on how to access Stata will be presented in the lab.

Problem Sets
Problem sets are *graded* and correspond to the course components outlined below. They will be assigned roughly every week and are meant to test your progress toward understanding the course material for each respective unit.

Problem sets will be posted on Canvas at the beginning of each unit. You will be responsible for accessing the files and for turning in your solutions (hard copy) at the beginning of class on the assigned due date. Your solutions may be handwritten or typed, whichever you prefer, but be sure to *SHOW YOUR WORK* to receive full credit.

You may work with other students on the problem sets and consult your notes as well as the textbook. However, your final answers must be your own. Please indicate that you worked with other students (in this section or my other section) on the problem set for that unit by writing their name(s) at the top of your assignment.

Exams
Exams are closed-book, but you will be allowed to use a formula sheet of no more than one page (front and back). There are three exams throughout the semester: two midterm exams and one cumulative final exam. The exams will correspond to the material in each of the course components (see below).

Makeup exams will not be administered. In case you must miss an exam for medical or personal reasons, the weight assigned to that exam will be distributed over the remaining exams. You must email me well in advance of the exam date should you need to miss an exam for any reason.

Course Components
The course is divided into three parts, each composed of several units (11 in total).

Part I – Describing Data and Making Sense of Randomness
1. Descriptive Statistics
2. Probability
3. Discrete Random Variables (RVs)

Part II – Understanding Distributions and Simple Statistical Tests
4. Continuous Random Variables (RVs)
5. Sampling Distributions
6. Estimation I
7. Hypothesis Testing I

Part III – Conducting Complex Statistical Tests and Regression Analysis
8. Estimation II
9. Hypothesis Testing II
10. Simple Regression
11. Multiple Regression

Note that the class schedule and exams are structured around these different course components. It is not an exhaustive list of topics in statistics, nor an exact breakdown of the subject matter, but it will help us stay on track!

Canvas Site
Be sure to check the course Canvas site frequently for announcements. All problem sets and lecture notes will also be posted to Canvas when it comes time to use them. Finally, check Canvas for changes to the syllabus, which I will update throughout the semester.

Electronics Policy
It is the 21st century, so I understand if you must use your electronic devices in a limited manner during class time. However, if it becomes distracting for other students or myself, I will kindly ask you to step out of the classroom until you are finished using the device. You *may use tablets* to take notes in class and I will try to post lecture slides before class

so that you can download or print them. However, please keep cell phone use to a minimum. Additionally, laptop use will not be allowed.

Email Policy
You are welcome to email me with logistical questions or questions about course material throughout the semester. During the week, I will respond to your email *within a 24-hour period*. If you send an email during the weekend (Friday after 6pm through Sunday) I will respond by Monday morning.

Academic Integrity
Cheating on any exam will result in:

1. An automatic failure in the course; and
2. Reporting the incident to the College of Arts and Sciences as required by the University.

See this site (https://www.bc.edu/bc-web/academics/sites/university-catalog/policies-procedures.html#academic_integrity_policies) for a full discussion of the University's policies and procedures regarding academic integrity.

Accommodations for Learning Disabilities
If you have a learning disability, you are strongly encouraged to request accommodations for this course. Exams are lengthy and have some time pressure. Please register with either Kathy Duggan (dugganka@bc.edu), Director, the Connors Family Learning Center (learning disabilities and ADHD) or Rory Stein (rory.stein@bc.edu), Associate Director, Student Disability Services (all other disabilities). Advance notice and appropriate documentation are required for accommodations.

COVID-19
We are still in a pandemic. Please stay updated on any announcements that come from the University regarding COVID-19. Submit to the required University testing as necessary. Let me know if you are experiencing any illnesses or other medical conditions and we will work together to make sure you stay up to date on course material. We will proceed with the class in-person for the time being, but may have to respond to unexpected circumstances throughout the semester. Please see the BC Forward website for more information: https://www.bc.edu/bc-web/sites/bc-forward.html.

Class Schedule

Date	Day	Topics	Unit	Chapters
8/30	M	Intro; Describing data graphically	Descriptive Statistics	1.1-1.6
9/1	W	Measures of central tendency	Descriptive Statistics	1.5, 2.1
9/6	M	**No Class – Labor Day**		
9/8	W	Measures of variability	Descriptive Statistics	2.2
9/13	M	Relationships between variables	Descriptive Statistics	2.4
9/15	W	Conditional probability	Probability	3.1-3.3
9/20	M	Joint probability; statistical independence	Probability	3.3-3.4
9/22	W	Bayes Rule	Probability	3.5
9/27	M	Discrete random variables (RVs); expected value; joint RVs	Discrete RV	4.1-4.3; 4.7
9/29	W	Binomial RV	Discrete RV	4.4
10/4	M	**Midterm Exam 1**		
10/6	W	Intro to continuous RVs; uniform distribution	Continuous RV	5.1-5.2; 5.6
10/11	M	**No Class – Fall Break**		
10/13	W	Normal distribution	Continuous RV	5.3-5.4
10/18	M	Distribution of sample mean	Sampling Distributions	6.1
10/20	W	Central Limit Theorem (CLT)	Sampling Distributions	6.2
10/25	M	Properties of estimators; confidence intervals (CIs)	Estimation I	7.1-7.2
10/27	W	CIs for sample mean; sample size determination for large pop.	Estimation I	7.1-7.2, 7.7
11/1	M	HT for sample mean, normal distribution with known variance	Hypothesis Testing I	9.1-9.2
11/3	W	Type I and II errors; power/size	Hypothesis Testing I	9.5
11/8	M	**Midterm Exam 2**		
11/10	W	Proportion; mean w/ unknown σ^2	Estimation II	7.3-7.5
11/15	M	Proportion; mean w/ unknown σ^2	Hypothesis Testing II	9.3-9.4
11/17	W	Difference in means	Estimation II	8.1-8.2
11/22	M	Difference in means	Hypothesis Testing II	10.1-10.2
11/24	W	**No Class – Thanksgiving**		
11/29	M	Introduction to regression	Simple Regression	11.1-11.3
12/1	W	Estimation, HT, and inference	Simple Regression	11.4-11.5
12/6	M	Estimation with multiple variables	Multiple Regression	12.1-12.3
12/8	W	Dummy variables; course review	Multiple Regression	12.8
12/15	W	Review session for final exam from 5-7pm (Location TBA)		
12/17	F	**FINAL EXAM @ 9:00am**		

Note: The Class Schedule is subject to change. I will do my best throughout the semester to update the Class Schedule and Syllabus to reflect the most current information. Check the date in the header on page 1 to see the most recent update to the syllabus.