

Economics 3100-03 – Quantitative Methods and Applications

CLASS DETAILS:

Times and Room: All classes asynchronous
Office Hours: Announced each week or by appointment
Syllabus updated: December 31, 2020

COURSE DESCRIPTION:

Data drives policy and business decisions. Statistical and quantitative methods are used throughout business, government, and the non-profit sector of the economy. An effective participant in decision-making must be able to, at a minimum, understand and interpret statistical reports. This course builds on the concepts and analytical techniques taught in ECON 2600 Introduction to Statistics to develop more advanced statistical and quantitative methods.

The goal of the course is to help you gain proficiency in applied statistical analysis using the techniques covered and the statistical software package R to prepare you for a career in consulting companies, banks, insurance companies, think tanks, non-governmental organizations, government agencies, marketing firms, etc.

ALBERS'S PROGRAM LEARNING GOALS:

Below are the objectives that the school has established for the course:

1. Introduce prospective managers to the quantitative tools that can be utilized in supporting business decisions. A special focus is placed on regression analysis and its use throughout the business decision-making process.
2. The course develops further the students' written communication and analytical skills through the use of case studies.
3. It introduces students to statistical software utilized in business practice.
4. Most importantly, it contributes to the development of students' critical thinking skills.

LEARNING OUTCOMES:

To pass this course you must be able to do the following:

1. Explain and motivate the assumptions underlying regression analysis.
2. Carry out basic applied statistical analysis using the tools covered on actual datasets.
3. Correctly interpret the results of statistical analyses.
4. Perform and correctly interpret model validation.

CANVAS:

All course material and problem sets will be on Canvas. It is your responsible to check it frequently and completing on-line problem sets before the due date.

TEXTBOOK:

The text is "Regression and Other Stories," 1st edition, Andrew Gelman, Jennifer Hill, and Aki Vehtari.

STATISTICAL SOFTWARE:

In addition to Excel, we will use a statistical software package called “R” for the course. R runs on Windows, Mac, and Linux and is an incredibly powerful tool. It does, however, have a bit of learning curve. R is free and I will provide information on how to install it on your computer.

GRADING:

Course grades will be assigned at the end of the quarter based on your performance in class using the following percentages:

- 40% On-line problem sets (drop lowest)
- 15% Midterm
- 15% Group case study
- 30% Final examination

The grade schedule is:

A range: 90-100% of total points — Superior performance

B range: 80-89% of total points — Good performance

C range: 70-79% of total points — Adequate performance

D range: 60-69% of total points — Poor performance

F range: less than 59% of total points — Failing

The grading schedule is subject to change during the course of the quarter based on the overall performance of the class, but it will not be made more difficult.

For the midterm you will have the option to completely re-write/re-answer any question you did not get full points on to help you better learn the topics you are having trouble with. You will need to submit the new answers typed, clearly indicating which questions you are re-attempting. Deadline will be 1 week after you receive the graded midterm back. The re-attempted questions will be graded as new, but you cannot get fewer points than on your original answer. Your score will be the average of the original mid-term/case study score and the re-written score.

CLASS STRUCTURE:

Understanding and utilizing statistical concepts takes work, a lot of work. The best way to learn is to through practice and repetition of problems. The tentative course schedule with topics, readings, midterm, and final exam dates is below.

ON-LINE PROBLEM SETS:

Doing problems is essential to mastering the course material. The assigned problems should be considered a minimum; you are expected to do additional problems in the text on your own. Your lowest assignment score is dropped. To receive credit, the assigned problems must be done on Canvas by their due dates. Dues dates are announced on Canvas.

MIDTERM:

There will be 1 midterm. There will be no makeup midterms. Problems on the midterm are generally similar to those assigned on problem sets.

CASE STUDY:

The case study is your opportunity to use quantitative methods to address real-world problems. The case study is graded on the quality of the technical analysis and interpretation of results as well as the quality of writing and presentation. You will get an outline of the grading rubric when we discuss the case study.

FINAL:

The final is cumulative. It is made up of questions similar to those on the midterms except it covers the whole quarter.

CANVAS:

All course material will be on Canvas: seattleu.instructure.com. It is your responsibility to check it frequently.

CONTACT INFORMATION:

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ACADEMIC INTEGRITY TUTORIAL:

<http://www.seattleu.edu/academicintegrity/>

ACADEMIC POLICIES ON THE REGISTRAR WEBSITE

Be sure that you understand the following university academic policies, posted on the Registrar's website:

- Academic integrity policy
- Academic grading grievance policy

<https://www.seattleu.edu/registrar/academics/performance/>

SUPPORT FOR STUDENTS WITH DISABILITIES:

Seattle University values diverse types of learners and is committed to ensuring that each student is afforded an equal opportunity to participate in learning experiences. For disability and other learning-related needs and accommodations that you have already arranged via Disability Services, please communicate with me during the first week of class through email or Zoom. Should concerns arise at any point in the quarter, please let me know as soon as possible.

If you have, or think you may have, a disability (including an "invisible disability" such as a learning disability, a chronic health problem, or a mental health condition) that interferes with your performance as a student in this class, but have not yet arranged support services and/or accommodations, I encourage you to do so through Disability Services staff at DS@seattleu.edu or (206) 296-5740. Disability-based adjustments to course expectations can be arranged only through this process. I am committed to working with you, so please do not hesitate to contact me.

ACADEMIC RESOURCES:

I strive to create a learning environment in which you can be incredibly successful. My goal is to create and improve the learning environment throughout the quarter based on my own observations of the course and your feedback on what would help you learn more. In return, I ask and encourage you to make the most of this learning opportunity. Also, please take advantage of the academic support services available to you at the university. Even if you have had excellent study skills in the past, it is very easy to slip into suboptimal habits and these services can help you excel in your studies. You can check the advice posted on the SU Orientation to Distance Learning site at <https://seattleu.instructure.com/courses/1563070/pages/study-habits>.

TUTORING:

- The economics department sponsors free tutoring for Econ 3100. You can book an appointment [here](#)

LIBRARY AND LEARNING COMMONS

<http://www.seattleu.edu/learningcommons/>

WRITING CENTER:

The Writing Center employs undergraduate writing consultants who assist students at all stages of the writing process. Consultants will help students begin writing tasks, organize and develop first drafts, and revise and edit later drafts. Given that the University has moved to online classes, the Writing Center is offering online appointments through asynchronous and synchronous options. Please visit <https://www.seattleu.edu/writingcenter/online-consultations/> to learn more about the online consultations or schedule an appointment through <https://seattleu.mywconline.com>.

LEARNING ASSISTANCE PROGRAMS:

Learning Assistance Programs provide peer tutoring, facilitated study groups, and learning strategy development through scheduled workshops and individual meetings with a learning specialist. Given that the University has moved to online classes, LAP will only be offering services remotely. Please visit our website <https://www.seattleu.edu/learning-assistance/> or e-mail us at learningassistance@seattleu.edu for the most updated information about accessing services.

ENGLISH-LANGUAGE LEARNING CENTER (ELLC):

The English Language Learning Center (ELLC) offers free tutoring for all SU students who are non-native speakers of English. Experienced ELLC tutors can help you improve your English language skills and better understand American culture. We can help with any type of assignment: written essays, online discussions, oral presentations, interview practice, etc. For the schedule or to book a session please visit <https://www.seattleu.edu/ellc/ellc-tutoring/>.

CLASS RECORDING:

Zoom meetings of this course may be recorded. Any recordings will only be available to students registered for this class. Recordings may not be reproduced, shared with those not in the class, or uploaded to other online environments.

ATTENDANCE AND PARTICIPATION EXPECTATIONS:

Numerous research studies have shown that when students actively ask and answer questions, they take greater interest in the material, they clarify shared misconceptions, and they retain more information.

I would like to see all of you actively participating in office hours, as well as in any activities or discussions on Canvas. Given our extraordinary circumstances, there is no attendance or participation grade in this course. Flexibility is key, and my primary goal is to enable you to focus on your learning without worrying about attendance if, for example, a member of your family is unwell and needs your support.

Economics 3100-03 — Schedule

Week	Book Chapters	Topic
1	1–3	Class overview and review of basic math and probability
2	4–5	Statistical inference and simulation
3	6–7	Introduction to simple linear regressions
4	8	Estimating models
5	9	Predictions and inference
6	10	Regression with multiple predictors
7	11	Assumptions and model evaluation
8	12	Transformations and regression
9	16	Sample size decisions
10	18	Using experiments
11		Final and deadline for case study