Economics 3100-02 – Quantitative Methods and Applications

CLASS DETAILS:
Times: Tuesday and Thursday: 10.15 AM – 12.20 PM
Room: Pigott 200
Office Hours: Tuesday and Thursday 1.30–2.30 PM, or by appointment
Syllabus updated: April 1, 2019

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.

ALBER'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 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 “Statistics for Management and Economics,” 10th edition, Gerald Keller. If you decide to use an earlier edition it is up to you to ensure that the material covered is the same.

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:
• 10% Pre-class problem sets (drop lowest)
• 5% In-class problem sets (drop two)
• 20% On-line problem sets (drop lowest)
• 10% Midterm I
• 15% Midterm II
• 10% 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 midterms 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. The best way to learn is to through practice and repetition of problems. You have to have read the material covered before class. The tentative course schedule with topics, readings, midterm, and final exam dates is below.

PRE-CLASS/JiTT PROBLEM SETS: The pre-class problems are very short problems that are due the night before class. These types of problems are also know as Just-in-Time-Teaching or JiTT questions. They serve two purposes. First, they act as an extra incentive for you to read before class and try the simple problems in the back of each chapter. Second, and more importantly, they help me better figure out which parts of the material we should spend more time on and which parts you already understand. The questions are graded based mainly on evidence of effort.

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.

IN-CLASS PROBLEMS: For most classes there will be a set of problems that you will do in-class in small groups. These are graded “check”/“no check”. You will not be able to do these unless you have already read the chapter. You get to drop two of these to help in case you cannot make it to class.
MIDTERMS: There will be 2 midterms. The first covers simple linear regressions. The second covers multiple variable regressions. There will be no makeup midterms. Problems on the midterm are generally similar to those assigned on problem sets and in-class problems.

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.

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: 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, you are encouraged to arrange support services and/or accommodations through Disabilities Services staff located in Loyola 100, (206) 296-5740. Disability-based adjustments to course expectations can be arranged only through this process.

ELECTRONIC DEVICES: The use of laptops, netbooks, tablets, etc, in class to take class notes, view slides or work on class projects is allowed. You need to ask permission to use laptops, netbooks, tablets, cellphones, etc, in class for any non-class related activity (including instant messaging, web-browsing, looking at cat videos, etc.).

EMAIL: Email is a blessing and a curse. It is an efficient means for requesting a meeting, but it can tempt you to avoid taking responsibility for ordinary course management. I will reply to emails that request a meeting, or a simple clarification of a course topic, but a detailed explanations of course material are best reserved for a face-to-face conversation. If you email me before noon I will do my best to respond the same day, otherwise you will receive a response the next business day. Do not expect a response over weekends or holidays. Finally, do not use Canvas 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.

- LIBRARY AND LEARNING COMMONS [http://www.seattleu.edu/learningcommons/](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.
- 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.

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**Economics 3100-03 – Schedule**

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<thead>
<tr>
<th>Date</th>
<th>Read book section(s)</th>
<th>Topic</th>
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<tbody>
<tr>
<td>04-02</td>
<td></td>
<td>Introduction and overview of class</td>
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<tr>
<td>04-04</td>
<td>Intro chapters</td>
<td>Introducing R and Excel and Data exploration</td>
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<tr>
<td>04-09</td>
<td>Intro chapters</td>
<td>Review and R/Excel practice</td>
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<tr>
<td>04-11</td>
<td></td>
<td>No class - University Mission Day</td>
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<tr>
<td>04-16</td>
<td>16.1-2</td>
<td>Linear regression model with 1 variable</td>
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<td>04-18</td>
<td>16.3</td>
<td>Model assumptions</td>
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<tr>
<td>04-23</td>
<td>16.4-5</td>
<td>Testing hypotheses and predictions (online)</td>
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<tr>
<td>04-25</td>
<td>16.6</td>
<td>Model diagnostics (online)</td>
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<td>04-30</td>
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<td>Review of Chapter 16 and R practice</td>
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<tr>
<td>05-02</td>
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<td><strong>Midterm I - Simple linear models (Chapter 16)</strong></td>
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<tr>
<td>05-07</td>
<td>17.1-2</td>
<td>Regression with multiple variables</td>
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<tr>
<td>05-09</td>
<td>17.3-4</td>
<td>Diagnostics yet again</td>
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<tr>
<td>05-14</td>
<td>18.2</td>
<td>Dummies - categorical variables</td>
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<td>05-16</td>
<td>18.1 and handout</td>
<td>Non-linear effects</td>
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<td>05-21</td>
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<td>Case study introduction and Review of Chapters 17 and 18</td>
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<td>05-23</td>
<td></td>
<td><strong>Midterm II - Multiple variable regression (Chapters 17 and 18)</strong></td>
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<td>05-28</td>
<td>20.1, 3-4</td>
<td>Time series</td>
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<tr>
<td>05-30</td>
<td>20.5</td>
<td>Forecasting and diagnostics for time series</td>
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<td>06-04</td>
<td>14.1-2</td>
<td>ANOVA</td>
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<td>06-06</td>
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<td>Review for final</td>
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<td>06-12</td>
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<td><strong>Final - 10.00-11.50 AM</strong></td>
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<tr>
<td>06-14</td>
<td></td>
<td>Deadline for case study</td>
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