

Statistical Modeling for Executives
EMBA 5310

Course Description and Objectives:

Data drives policy and business decisions and an effective participant in decision-making must be able to understand all aspects of the data. In order to be able to judge the merit of recommendations made on the basis of these data it is essential that you have a solid understanding of the meaning, the limitations, and the underlying assumptions of the techniques employed to arrive at those recommendations. In this course we will study different methods of collecting, analyzing, and presenting data. In addition, common pitfalls, paradoxes and fallacies will be discussed. Topics include descriptive statistics, basic probability theory, sampling, hypothesis testing, simple linear regression, and multiple regression analysis with an emphasis on applications to business decisions and interpretation of findings. Throughout the course we will discuss examples from a variety of business disciplines in order to highlight the relevance of the material and to integrate the course with other courses within the program.

This course addresses the following program learning outcomes:

1. Students are capable of rigorous analysis of data and stakeholder concerns.
2. In business and in personal lives, students will act to preserve or enhance the well being of the commons (global, health, and social justice).
3. Demonstrate wisdom through judgment/decision-making that integrates the needs of multiple stakeholders and adapts personal behavior appropriately.

This course has the following specific course objectives:

1. Identify the nature of data and its context, and potential sources of biases.
2. Convey information about the data via summary statistics and visual representations.
3. Explore the direction, shape, and strength of relationships among data.
4. Use samples as a way to learn about their source populations.
5. Interpret and explain the meaning, language, and mechanics of hypothesis testing.

“Office Hours”:

I will be available for questions over email (chunnj@seattleu.edu) or via Skype (jenchunn), Google Hangout (jenchunn), or any other videoconferencing software. In addition, I will be at Chardin Hall before and after scheduled class times. If you would prefer to meet in person during the work week, I can meet downtown during work weeks. Please email me to schedule meetings.

Class Schedule & Assignments

Date & Time	Pre- Class Reading	OpenIntro exercises (ans in back of book)	Discussion topics	Deliverable(s)
Fri, Apr 6	Short Pre-Course Exercise Due Fri Apr 6, 1:30pm Complete prior to first class			
Fri, Apr 6 1:45 – 4:45	Levitin: pp 1-74 DCB: 1.1-1.3, 1.6, 1.7 Schwabish article Tableau help videos (links on Canvas)	1.3, 1.5, 1.45, 1.53, 1.55, 1.59, 1.63, 1.65, 1.67	Data and Data Visualization Intro to Tableau	
Sat, Apr 7 – Thu, Apr 20	Assignment #1 Due Sun Apr 15, midnight Brainstorm project idea			
Sat, Apr 21 1:45 – 2:45 3 – 5:30	Levitin: pp 1-74; 198-210 DCB: 7.1 – 7.3; 8.1 Silver article Tableau help videos (links on Canvas)	1.19, 1.39, 7.3, 7.5, 7.7, 7.11, 7.23, 7.27, 7.29	Modeling continuous data Regression in Tableau and Excel	
Sun, Apr 22 – Fri, May 11	Project Proposal + Data Due Sun Apr 22, midnight Assignment #2 Due Sun May 6, midnight			
Sat, May 12 1:45 – 2:45 3 – 5:30	Levitin 75-176 DCB: 1.4, 1.5, 1.8 DCB: 2.1-2.2 (skim); 4.1-4.5, 7.4 DCB: 8.4 (skim) McAfee and Brynjolfsson article Wessel article	1.9, 1.13, 1.15, 1.17, 1.21, 1.25, 1.27, 2.19, 4.9, 4.11, 4.13, 4.21, 4.43, 4.45, 4.47	Statistical significance, Multiple Regression Data Science, Machine Learning and Big Data	
Sun, May 13 – Fri, Jun 8	Upload plots to Canvas Due Sun May 20, midnight Discussion board feedback (at least 3 postings) Due Sun May 27, midnight			
Sat, Jun 9 3:45 – 5:30			Project Presentations Ethics and Data	Group Presentation Assignment #3

Course Requirements:

1. Three Written Assignments + 1 short Pre-course exercise (Individual) (35 %): Check Canvas for assignment instructions. Written assignments will be submitted via Canvas.
2. Data Visualization Project + Presentation (Team) (30 %): Each team will submit the following: (i) project proposal + data; (ii) initial visualizations to discussion board; (iii) final presentation. See Canvas for details.
3. Project Discussion Board Feedback (Individual) (10%): Each individual is expected to provide project feedback to *at least* three teams on the Canvas discussion board.
4. In Class Applications (Individual + Team) (25 %): There will be in-class exercises to provide hands-on understanding of the concepts covered and practice the tools for analyzing data.

Materials:

Books:

- Diez, David M., Barr, Christopher D., and Çetinkaya-Rundel, Mine. (2015). *OpenIntro Statistics, Third Edition*. Creative Commons. [DBC]
A free PDF version is available online at: www.openintro.org . Videos reviewing the material are also available on the website.
- Levitin, Daniel. (2016). *A Field Guide to Lies: Critical Thinking in the Information Age*. New York: Dutton.

Computing:

- Tableau Desktop. For the duration of this course, Tableau's [data visualization software](#) is provided for free through the Tableau for Teaching program. See Canvas for installation instructions and product key.
- Microsoft Excel 2013 or 2016. Note, some analysis cannot be run on Macs for versions of Excel before 2016. You can run virtual desktop at Seattle University at <https://desktop.seattleu.edu>. Or, Seattle U offers FREE MS Office 365 to students, which can be downloaded at www.Office.com/GetOffice365.

Online Tableau Tutorials:

- Video tutorials: <http://www.tableau.com/learn/training>
- Written tutorials: <http://www.tableau.com/support/help>
- See Canvas for list of specific links to training videos.

Articles:

- Schwabish, Jonathan A. (2014). An Economist's Guide to Visualizing Data. *Journal of Economic Perspectives*, 28(1), 209-234.
- Silver, Nate. (2014, April 9). Gender Pay Gap Tracks With Number of Women in State Legislatures. *FiveThirtyEight*. Retrieved from <https://fivethirtyeight.com/datalab/the-gender-pay-gap-and-womens-representation-in-political-office/>
- McAfee, Andrew and Erik Brynjolfsson. (2012, October). You Don't Need Big Data — You Need the Right Data. Retrieved from <https://hbr.org/2012/10/big-data-the-management-revolution>
- Wessel, Maxwell. (2016, November 3). Big Data: The Management Revolution. *Harvard Business Review*. Retrieved from <https://hbr.org/2016/11/you-dont-need-big-data-you-need-the-right-data>
- Love, Jessica. (2016, March 11). Is Your Digital Advertising Campaign Working? *Kellogg Insight*. <https://insight.kellogg.northwestern.edu/article/is-your-digital-advertising-campaign-working>
- Gordon, Brett, Florian Zettelmeyer, Neha Bhargava, and Dan Chapsky. (July 1, 2016) A Comparison of Approaches to Advertising Measurement: Evidence from Big Field Experiments at Facebook. White Paper Version 1.1. http://www.kellogg.northwestern.edu/faculty/gordon_b/files/kellogg_fb_whitepaper.pdf

Video:

- Hillman, Dan (Producer and Director). (2010). *The Joy of Statistics*. United Kingdom: British Broadcasting Corporation. Viewed from: <https://www.gapminder.org/videos/the-joy-of-stats/>
- Cukier, Kenneth. (2014, June). Big Data is Better. Viewed from: https://www.ted.com/talks/kenneth_cukier_big_data_is_better_data?language=en
- Crawford, Kate. (2013, Nov 8). Big Data Gets Personal. Viewed from: <https://www.youtube.com/watch?v=JltwkXiBBTU>
- O'Neil, Cathy. (2017, April). The Era of Blind Faith in Big Data Must End. Viewed from: https://www.ted.com/talks/cathy_o_neil_the_era_of_blind_faith_in_big_data_must_end

Optional Supplemental readings:

- Knaflic, Cole Nussbaumer. (2015). *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Wiley Publishing.
- Provost, Foster and Tom Fawcett. (2013). *Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking*. O'Reilly Media.

University Resources and Policies

Academic Resources

- Library and Learning Commons (<http://www.seattleu.edu/learningcommons/>)
(This includes: Learning Assistance Programs, Research [Library] Services, Writing Center, Math Lab)
Note: The Learning Commons does not offer tutoring for EXLR/EMBA/HEMBA-level students.
- Academic Integrity Tutorial (*found on SU Online*)

Academic Policies on Registrar website

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

- Academic Integrity Policy
- Academic Grading Grievance Policy
- Professional Conduct Policy (*only for those professional programs to which it applies*)

Title IX

Title IX of the Education Amendments of 1972 (Title IX) prohibits discrimination based on sex in educational programs or activities that receive Federal financial assistance. This prohibition includes sexual misconduct, which encompasses sexual harassment and sexual violence. Seattle U remains committed to providing a safe and equitable learning, living, and working environment. Seattle U offers emergency, medical, and other support resources, as well as assistance with safety and support measures, to community members who have experienced or been impacted by sexual misconduct.

Seattle U requires all faculty and staff to notify the University's Title IX Coordinator if they become aware of any incident of sexual misconduct experienced by a student.

For more information, please visit <https://www.seattleu.edu/equity/>. If you have any questions or concerns, you may also directly contact the Title IX Coordinator in the Office of Institutional Equity (**email:** oi@seattleu.edu; **phone:** [206.296.2824](tel:206.296.2824))

Notice for students concerning 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.