

## **SYLLABUS FOR BUSINESS STATISTICS 41000: Autumn 2022**

Instructor: David K.A. Mordecai, Adjunct Professor of Econometrics and Statistics

Office hours: Thursday afternoons by appointment

Teaching Assistant(s): TBD

Scheduled Review Sessions: TBD

### **Course Objectives and Other Information**

This course introduces fundamental statistical concepts and basic computational methods for data analysis, in order to perform descriptive and predictive data analysis based on real datasets as a quantitative foundation for Chicago Booth elective courses in marketing, finance and economics as well as for advanced courses in data science. The primary emphasis will be practical application of critical statistical thinking and problem solving to analyze complex empirical examples from economics, finance and marketing with a primary emphasis on conceptual intuition in the analysis of data, as well as fundamental intuition for statistical science, foundational to critical analysis and validation of models and evaluate workproduct in order to manage quants and data science teams.

Topics to be addressed include: (i) descriptive statistics and data visualization; (ii) random variables and expectations; (iii) statistical model specification and inference; (iv) analysis of variance, goodness-of-fit and error diagnostics, population versus sample statistics, confidence intervals, hypothesis tests, t-statistics and p-values; (v) linear and logistic regression; (vi) introduction to multiple regression; (vii) basic times series analysis: autocorrelation, autoregression, the random walk, the z-transform and its role in time series analysis. What is prediction (vs estimation, classification, regression)?

### **Recommended Textbook(s)**

#### **Principal Reference Text:**

Dietz, David et al (2019) *OpenIntro Statistics*

(free download available at: <https://www.openintro.org/stat/textbook.php>)

#### **Supplemental Reference Text**

Lind, Douglas A., William G. Marchal and Samuel A. Wathen (2019) *Statistical Techniques in Business Economics*

(free download available at: <https://shamsfoe.files.wordpress.com/2019/09/statistical-techniques-in-business-and-economics-lind-douglas-srg.pdf>)

## Supplemental Reading

Salsburg, David (2002) *Lady Tasting Tea: How Statistics Revolutionized Science in the Twentieth Century*

Salsburg, David (2017) *Errors Blunders & Lies: Errors, Blunders and Lies: How to Tell the Difference*

Good, P.I., J.W. Hardin (2012) *Common Errors in Statistics (and How to Avoid Them)*

Angrist, J.D., J-S. Pischke (2008) *Mostly Harmless Econometrics*

Provost, F., T. Fawcett (2013) *Data Science for Business: What You Need to Know About Data-Mining and Data-Analytic Thinking*

Chen, X., N.R. Swanson eds. (1989) [Recent Advances and Future Directions in Causality, Prediction, and Specification Analysis: Essays in Honor of Halbert L. White Jr.](#)

## Lecture Notes and Homework

Available here: <https://numeratipartnersllc.com/business-statistics/>

## Computing/Software

Required: Excel Data Analysis Toolpak (<https://support.microsoft.com/en-us/office/load-the-analysis-toolpak-in-excel-6a63e598-cd6d-42e3-9317-6b40ba1a66b4#OfficeVersion=Windows>)

Optional: R or Python SciPy (subject to the degree of individual proficiency)

## Grades

Grades will be determined based on the following:

(A) Homework (20%), Mid-Term Exam (30%) and (B) Final Group Project (50%)

## Prerequisites

There are no specific prerequisites for the course. The initial class assignment is to read chapters 1-3 of the principal reference text *OpenIntro Statistics* as general background for the course.

## Honor Code

Students must abide all times by the standards of the University of Chicago Booth School of Business Honor Code, as per the Chicago Booth Student Handbook.