DePaul University

IT 403: Statistics and Data Analysis

Syllabus for Fall Quarter, 2018

Instructor: Yiou Li

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Class Hours: Th 5:45PM - 9:00PM

Room: Lewis Center Room 1216

Office Hours: Th 4:15PM - 5:15PM , or by appointment

Textbook:

- Introduction to the Practice of Statistics, Eighth Edition, by D.S. Moore, G.P. McCabe and B. Craig (2013). (NOTE: Previous editions of the book are fine).

Course Description: The aim of the course is to illustrate statistical and data analysis methods and basic concepts of probability theory. The course topics include descriptive statistics, data visualization, an introduction to statistical inference (confidence intervals and hypothesis testing), analysis of two-way tables and linear regression models. The students will learn the statistical package SPSS and use it to compute statistical analyses of data sets from real-world applications.

Course Objectives:

- develop an understanding of the basic concepts of probability and statistics,
- help students be informed and critical readers of quantitative arguments,
- provide sufficient skills to apply simple statistical techniques with the aid of a computer,
- appreciate the role of statistics in empirical research and scientific study,
- gain flexible problem-solving skills applicable to unfamiliar statistical settings.

Prerequisites: Students are expected to understand basic mathematical notation and be familiar with college algebra concepts. See this link for a good online tutorial: `http://www.wtamu.edu/academic/anns/mps/math/mathlab/col_algebra/index.htm`.

Course Plan (tentative):

Time	Date	Topic/Activities
Week 1 (Th)	9/6/18	Exploratory data analysis: analyzing univariate distribution using graphs and summary statistics for center and spread
Week 2 (Th)	9/13/18	Data Relationships: Scatter plots and correlation. Introduction to regression analysis: model fitting and diagnostic, residual analysis.
Week 3 (Th)	9/20/18	Design of experiments, observational studies. Sample surveys.
Week 4 (Th)	9/27/18	Randomness and the language of probability;Probability rules; Random variables; expected value and variability.
Week 5 (Th)	10/4/18	Density functions and normal distribution. Use the normal distribution to approximate symmetric distributions. Normal quantile plots to test normality assumptions.
Week 6 (Th)	10/11/18	Toward statistical inference: Sampling distribution for sample averages. Estimate averages using Confidence Intervals.
Week 7 (Th)	10/18/18	Sampling distributions for proportions. Estimating proportions using confidence intervals.
Week 8 (Th)	10/25/18	Hypothesis Testing. Significance tests on averages and proportions.
Week 9 (Th)	11/1/18	Contingency tables and Independence tests.
Week 10 (Th)	11/8/18	Review for final exam
Final Week	11/15/18	In-class final exam

Homework: There will be homework assignments (approximately) each week. The homework will be assigned one week before submission. It will be collected in class the following week for in class session, and due on d2l 6:00pm Chicago time on the same day for online session. Late homework will **NOT** be accepted. Solutions should be complete in order to get full credit. The assignments are individual work unless specified. The submitted solutions should be your solutions and must not be copied from anyone else. Be sure to write your full name and class number on the first page. Submitted assignments MUST be stapled.

Group work: There will be two small group projects. There will be seven groups named after seven famous statisticians, and you can choose a group to join. You don't have to stay in the same group for two projects, and actually switching group is encouraged. Detailed requirements will be posted later.

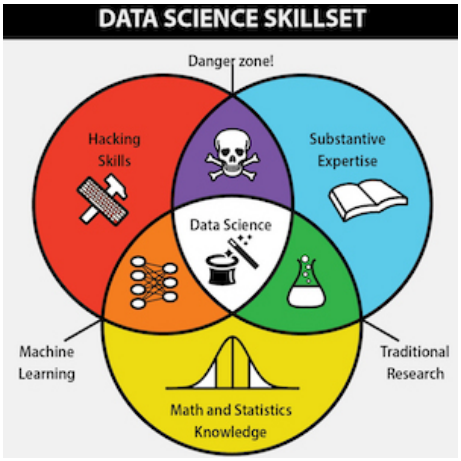
Quizzes: There will be FIVE online quizzes. You have TWO attempts each with 40 minutes for a quiz. FIVE days are allowed to complete a quiz.

Final exam:
The final exam is two hours and fifteen minutes. The exam will be closed notes and books, a letter-sized double sided cheat sheet and a regular calculator are allowed.
In-class session: The exam will be in class tentatively scheduled for Nov. 15th, 2018. There will be **NO** make-up exam for unexcused absence.
Online session: Online students must schedule their final exam during the following time frame: Wednesday, Nov 14th, 2018 through Sunday, Nov 18th, 2018.

Gradings:
Homework - 45%, Projects - 5% each, Quizzes - 15%, Final exam - 30%

A	A-	B+	B	B-	C+
93%-100%	90%-93%	87%-89%	83%-86%	80%-82%	77%-79%
C	C-	D+	D	D-	F
73%-76%	70%-72%	67%-69%	63%-66%	60%-62%	<60%

Why Statistics is important for Data scientists?



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DePaul University is a learning community that fosters the pursuit of knowledge and the transmission of ideas within a context that emphasizes a sense of responsibility for oneself, for others and for society at large. Violations of academic integrity, in any of their forms, are, therefore, detrimental to the values of DePaul, to the students' own development as responsible members of society, and to the pursuit of knowledge and the transmission of ideas. Violations include but are not limited to the following categories: cheating; plagiarism; fabrication; falsification or sabotage of research data; destruction or misuse of the university's academic resources; alteration or falsification of academic records; and academic misconduct. Conduct that is punishable under the Academic Integrity Policy could result in additional disciplinary actions by other university officials and possible civil or criminal prosecution.
Please refer to your Student Handbook or visit:
`http://studentaffairs.depaul.edu/homehandbook.html` for further details.

CENTER FOR STUDENTS WITH DISABILITIES (CSD)
Students who feel they may need an accommodation based on the impact of a disability should contact me privately to discuss their specific needs. All discussion will remain confidential. To ensure that you receive the most reasonable accommodation based on your needs, contact me as early as possible in the quarter (preferably within the first week or two of the course) and be sure to contact the following office for support and additional services:
Center for Students with Disabilities (CSD) in Lincoln Park Campus Student Center Suite 370 773.325.1677
Or
Center for Students with Disabilties (CSD) in the Loop Campus Lewis Center 1420 773.362.8002

Feedback:
I will be more than happy to discuss with you any questions regarding the class. If you have any questions, recommendations, please feel free to visit my office hours or arrange an appointment.