Syllabus for IEOR 4150 (Introduction to Probability and Statistics) Fall 2015

Course objectives This course is your first foray into the world of probability and statistics. At the end of this course, you will have a basic toolkit for analyzing and understanding data, and you will have learned why and how probability and statistics are interrelated.

Course topics This course covers the following topics: Fundamentals of probability theory and statistical inference used in engineering and applied science; Probabilistic models, random variables, useful distributions, expectations, law of large numbers, central limit theorem; Statistical inference: point and confidence interval estimation, hypothesis tests, linear regression.

Prerequisites Calculus, including multiple integration.

Instructor The course is taught by Dr. Ton Dieker. I prefer to receive questions in person but you can contact me at ton.dieker@ieor.columbia.edu.

Course assistants TBA

Classroom Mudd 833; meeting times: 4:10pm – 5:25pm Mon/Wed.

Recitation TBA

Class material We use the book “Introduction to Probability and Statistics for Engineers and Scientists, Fifth Edition” by Sheldon Ross, as well as some supplementary material. Supplementary class material will be posted on Courseworks, https://courseworks.columbia.edu.

Project Students are required to do a group project using financial data. The project will require you to do some computer programming. At the end of the semester, each team is required to submit a report on your project as well as a web app. A guideline for its length is 4–8 pages (excluding references, the app, and computer code). You are also required to submit your computer code. All team members are expected to contribute to all aspects of the project work (statistical analysis, coding, writing). Students will be asked to provide confidential feedback about the work contribution of his/her team members through a peer evaluation.

Homework Exercises Homework will be given every week. No late homework will be accepted. The homework may include group problems, which only need to be turned in by one of the team members. The rest of the homework should be turned in by everybody individually. You may discuss homework with classmates, in which case you have to mention on your paper with whom you have discussed it.

R and Rstudio Some of the homework requires some coding in R, and part of the project deliverable is a web app in R. To complete these parts of the course, you need to download and install R, Rstudio desktop, and Shiny. Use http://www.rstudio.com as a starting point.

Exams There is one in-class midterm and a final exam. The midterm will be on October 21, 2015. The final exam will be in the exam period starting December 17; once available, details can be found on the SEAS final exam calendar.

Grading Homework 10%; Midterm 35%; Final exam 40%; Project 15%.

Your grade for the project is based on five equally weighted components: correctness, content, style/mechanics (for the report), and code quality, user experience (for the app). Each of the team members receives the same project grade, but the peer evaluations may be taken into account.

Office Hours My office hours are 6:00pm – 7:30pm on Mondays. My office is 4?? Mudd.

Honor Code Students are reminded to observe the IEOR Code of Academic Integrity.