IEOR 165 – Engineering Statistics, QC, and Forecasting Spring 2017

Instructor: Anil Aswani
4119 Etcheverry
Office hours – Tu 10-11A; Th 230-330P
aaswani@berkeley.edu

GSI: Yonatan Mintz
4176B Etcheverry
Office hours – TuTh 3-4P
ymintz@berkeley.edu

Lectures: TuTh 11-1230P, 3106 Etcheverry

Discussions: Section 1: F 10-11P, 310 Hearst Memorial Mining Building
Section 2: W 3-4, 240 Bechtel

Website: http://ieor.berkeley.edu/~ieor165/

Optional Textbooks: 1. *Introduction to Probability and Statistics for Engineers and Scientists*, by Sheldon Ross
2. *Introduction to Time Series and Forecasting*, by Peter Brockwell and Richard Davis
http://link.springer.com/book/10.1007%2Fb97391

Prerequisites: IEOR 172 or STAT 134 or an equivalent course in probability theory

Grading: Project (20%); homeworks (20%); midterm (20%); final exam (40%)

Midterm: Tuesday, Mar 14, 2017 11-1230P

Final Exam: Thursday, May 11, 2017 8-11A

Description: This course will introduce students to basic statistical techniques such as parameter estimation, hypothesis testing, regression analysis, analysis of variance. Applications in forecasting and quality control.

Outline: Specific topics that will be covered include:

- Regression – Basic optimization; maximum likelihood estimation; least squares regression; high-dimensional regression; support vector machines (SVM's) (about 6 weeks)

- Forecasting – ARAR algorithm; Holt-Winters algorithm; Holt-Winters seasonal algorithm (about 1 week)

- Hypothesis Testing – Review of probability; t-test; confidence intervals; Mann-Whitney U test; multiple testing; ANOVA; Kruskall-Wallis test; likelihood ratio tests; quality control (about 6 weeks)