IEOR 165 – Engineering Statistics, Quality Control, and Forecasting
Spring 2015

Instructor:	Anil Aswani 4119 Etcheverry Office hours – TuTh 9-10A aaswani@berkeley.edu
GSI:	Tugce Gurek 4176 Etcheverry tugce.gurek@berkeley.edu
Lectures:	TuTh 11-1230P, 101 Moffitt
Discussions:	Section 1: M 2-3P, 3113 Etcheverry Section 2: F 2-3P, 3113 Etcheverry
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:	Homeworks (30%); midterm (30%); final exam (40%)
Midterm:	Tuesday, Mar 17, 2015 11-1230P
Final Exam:	Thursday, May 14, 2015 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:

- 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)
- 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 3 weeks)