

IEOR 165 – Engineering Statistics, QC, and Forecasting Spring 2016

Instructor:	Anil Aswani 4119 Etcheverry Office hours – Tu 10-11A; Th 1-2P aaswani@berkeley.edu
GSI:	Sheng Liu 1174B Etcheverry Office hours – ThF 4-5P lius10@berkeley.edu
Lectures:	TuTh 11-1230P, 3106 Etcheverry
Discussions:	Section 1: F 3-4P, 3107 Etcheverry Section 2: F 10-11A, 241 Cory
Website:	http://ieor.berkeley.edu/~ieor165/
Optional Textbooks:	1. <i>Introduction to Probability and Statistics for Engineers and Scientists</i> , by Sheldon Ross 2. <i>Introduction to Time Series and Forecasting</i> , 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 15, 2016 11-1230P
Final Exam:	Thursday, May 12, 2016 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; Kruskal-Wallis test; likelihood ratio tests; quality control (about 6 weeks)