# IEOR 165 – Engineering Statistics, Quality Control, and Forecasting
# Spring 2019

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**Instructor:** Anil Aswani
4119 Etcheverry
Office hours – Tu 230-330P; Th 1130-1230p
aaswani [at] berkeley [dot] edu

**GSI:** Matt Olfat
molfat [at] berkeley [dot] edu

**Lectures:** TuTh 1230-200P, 105 North Gate

**Discussions:** Section 1: W 4-5P, 3108 Etcheverry
Section 2: F 4-5P, 3106 Etcheverry

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

**Optional Textbook:** *Introduction to Probability and Statistics for Engineers and Scientists*, by Sheldon Ross

**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, March 19, 2019 1230-200P

**Final Exam:** Thursday, May 16, 2019 3-6P

**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)