

SYLLABUS FOR STATISTICS C183/C283 - LECTURE 1
STATISTICAL MODELS IN FINANCE
SPRING QUARTER 2016

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Office hours: MTWRF 15:00-17:00

Lecture	Day	Class Time	Location
Lecture 1	MWF	11:00 - 11:50	KINSEY PAVILION 1240B

Lab	Day	Lab Time	Location
Optional	W	15:00- 17:00	TBA

RESOURCES:

Handouts can be accessed at http://www.stat.ucla.edu/~nchristo/statistics_c183_c283/

Software:

R, can be downloaded freely from <http://cran.stat.ucla.edu>

RStudio, can be downloaded freely from <https://www.rstudio.com>.

Statistics Online Computational Resource (SOCR), freely available at: <http://www.socr.ucla.edu>.

COURSE PREREQUISITES:

Statistics 100B.

OUTLINE

In this course students will be exposed to several statistical techniques used in investment theory and get hands on experience by applying the various models on real stock market data. The course consists of two major parts.

Part I:

This part of the course will be devoted to portfolio management. The topics are listed below:

- a. Combining individual stocks into portfolios (risk and expected return of a portfolio).
- b. Maximizing return given risk, or minimizing risk given return.
- c. Properties of the minimum variance set (efficient frontier).
- d. The single index model (with and without short sales allowed).
- e. Constant correlation model (with and without short sales allowed).
- f. Multi-group model (short sales allowed).

Part II:

This part of the course will discuss some topics pertaining to managing investment risk. These topics include:

- a. Pricing of complex securities such as European and American options.
- b. Investing strategies using options.
- c. Binomial model.
- d. Weiner and Markov processes.
- e. Ito's lemma.
- f. Log-normal property of stock prices.
- g. Black-Scholes model.
- h. "The Greeks".
- i. Implied volatility.
- j. Simulations.

COURSE POLICIES:

Please remember to turn off cell phones. The use of laptop computers or other electronic devices will not be permitted in class. You are expected to adhere to the honor code and code of conduct. If you have a disability that will require academic accommodation, please contact the UCLA Office for Students with Disabilities (OSD).

ACADEMIC INTEGRITY:

As a student and member of the University community, you are here to get an education and are, therefore, expected to demonstrate integrity in your academic endeavors. All students must uphold University of California Standards of Student Conduct as administered by the Office of the Dean of Students. Students are subject to disciplinary action for several types of misconduct, including but not limited to: cheating, multiple submissions, plagiarism, prohibited collaboration, facilitating academic dishonesty, or knowingly furnishing false information. You may have assignments or projects in which you work with a partner or with a group. For example, you are welcome, and even encouraged, to work with others to solve homework problems. Even though you are working together, the assignment you submit for a grade must be in your own words, unless you receive specific instructions to the contrary. For more information about academic integrity, please go to <http://www.deanofstudents.ucla.edu/>.

COURSE GRADES:

There will be three (3) exams, a project, and homework or labs that will be assigned every week. Please staple your homework or labs and write your name on them. Late homework or labs will not be accepted and make-up exams will not be given. Being in class on time and fully participating is important for your understanding of the material and therefore for your success in the course. The tentative dates for the exams are shown below.

FINAL PROJECT:

For the project, students will select 20-30 stocks from 5 industries. Using the models discussed in class, students will construct efficient portfolios and analyze their performance over time. This on-going project will be discussed regularly with the instructor on its progress. The project is required and it is due anytime during week 8 of the quarter, 16-20 May.

The course grade will be based on the calculation:

$$\begin{aligned} \text{Final score} &= 0.10 \times \text{Homework/Labs} + 0.10 \times \text{Project} \\ &+ 0.25 \times \text{Exam1} + 0.25 \times \text{Exam2} + 0.30 \times \text{Exam3} \end{aligned}$$

COMMUNICATION:

Please keep a current e-mail address with my.UCLA.edu in order to receive class announcements and reminders.

IMPORTANT DATES:

First day of classes: 28 March.

Last day of classes: 03 June.

Holidays: 30 May (Memorial Day).

EXAMS:

Exam 1: Week 4.

Exam 2: Week 7.

Exam 3: Week 10.

Good Luck !!!