Instructor: Nicolas Christou  
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e-mail: nchristo@stat.ucla.edu  
Course website: http://www.stat.ucla.edu/~nchristo/statistics_c183_c283/  
Office hours: MWF 17:00-19:00, TR 16:00 - 18:00

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<td>Lecture 1</td>
<td>MWF</td>
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OFFICE HOURS:  
Office hours are offered every day including Saturdays and Sundays. Do not hesitate to come to office hours if you have any questions. It will be great to see you! The weekend office hours will be announced by email every Friday. The office hours during the week are MWF 17:00-19:00, TR 16:00 - 18:00.

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.  

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. Multigroup and multi-index models s(short sales allowed).

Part II:  
This part of the course will discuss topics on options pricing and investment strategies:  
a. Investing strategies using options.  
b. Binomial model.  
c. Weiner and Markov processes.  
d. Ito's lemma.  
e. Log-normal property of stock prices.  
f. Black-Scholes model.  
g. “The Greeks”.  
h. Implied volatility, simulations.  
i. Value at Risk (VaR).
COURSE POLICIES:
Zoom etiquette:
- If you can, please be on time and be prepared with your device charged. Make sure all tech works 5-10 minutes before the meeting.
- Mute yourself to eliminate background noise. You can unmute yourself when asking a question.
- You can also use the chat function when needed so the instructor can respond to questions promptly.
- All lectures will be delivered live and attendance is highly recommended. The lectures will be recorded and the videos will be posted on CCLE on the same day.

ACCOMMODATIONS:
Students needing academic accommodations should contact the Center for Accessible Education (CAE): http://www.cae.ucla.edu or call (310) 825-1501.

STUDENT RESOURCES:
- Student resources for remote learning: https://teaching.ucla.edu/resources/students/.
- Resources on Equity, Diversity, and Inclusion: https://equity.ucla.edu/know/.
- Students can embrace their identities - LGBTQ Center: https://www.lgbt.ucla.edu.

ACADEMIC INTEGRITY:
You are expected to adhere to the honor code and code of conduct. 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:
We will maintain the academic rigor of an upper division/graduate course in statistics while being flexible in student assessment. There will be one midterm exam, three quizzes, weekly homework, a final exam, and a final project.

1. Final exam (25%): The final exam will be assigned at 13:00 (Los Angeles time) on Saturday 05 June and it will be due by 13:00 (Los Angeles time) on Monday, 07 June.
2. Midterm (20%): This will be a 2-hour exam scheduled for 18:00-20:00 on Wednesday, 05 May.
3. Three 12-hour quizzes (15%) assigned on Wednesday at 15:00 (Los Angeles time) of weeks 3, 7, and 9.
4. Weekly homework (20%). There is flexibility on the submission due dates. Homework can still be uploaded 24 hours after the due date. All homework assignments will be uploaded on Gradescope (https://www.gradescope.com).
5. Project (20%). The project is required and it is due anytime during week 8 of the quarter, 17-21 May.

Project:
For the project, students will select 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. You will have $1,000,000 to invest in these 30 stocks. The project is required and it is due anytime during week 8 of the quarter, 10-14 May.

The course grade will be based on the calculation:

Final score = 0.20 × Homework + 0.15 × Quizzes + 0.20 × Midterm + 0.20 × Project + 0.25 × Final

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: 29 March.
Last day of classes: 04 June.
Holidays: Monday, 31 May (Memorial Day).

EXAMS:
Final exam: Take-home, Saturday, 05 June, due by Monday, 07 June.
Midterm: Wednesday, 05 May, 18:00 - 20:00.
Quiz 1: Wednesday, 14 April.
Quiz 2: Wednesday, 12 May.
Quiz 3: Wednesday, 26 May.

Good Luck !!!