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Syllabus for Advanced Financial Economics

Prof. Dr. Yucheng Yang

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Spring 2024

Course Description:

This course aims to introduce students to asset pricing, combining modern theory with practical empirics. Topics I plan to cover include portfolio theory, CAPM, No Arbitrage, Arrow-Debreu pricing; security structure, market completeness; and applications of machine learning in asset pricing. The course is designed for Master students but is also open to undergraduate and PhD students. I assume that the students taking the class have knowledge in intermediate micro and math for economists.

Lecture and Exercise Time:

Lectures are Thursday 4:15-6 pm. Exercises are Monday 4:15-6 pm. Due to travel commitments, I will reschedule a few lectures to Mondays, and the TAs will hold exercise sessions on Thursdays in those weeks.

Locations:

Thursday (lectures and some rescheduled exercises): KO2-F-180
Mondays (exercises and some rescheduled lectures): SOD-1-102

Lecture Slides:

The lecture slides are the main materials for this course. I will post the slides before each lecture. The slides are evolving as I teach, so I will keep updating them throughout this semester. I will provide other materials below to help you understand my slides.

Other materials:

There is no textbook for this course. The following books, lecture notes, and review papers could be helpful for you to understand the course materials.

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1. Kubler, Felix (2023) Lecture Notes on Advanced Financial Economics. Available OLAT.
2. Brunnermeier, Markus (2014), Lecture Notes on "Asset pricing I: Pricing Models"
https://markus.scholar.princeton.edu/sites/g/files/toruqf2651/files/markus/files/fin_501_lecture_notes_2014.pdf
3. E, Weinan and Yucheng Yang (2019), Lecture Notes on "Macroeconomic Analysis with Machine Learning and Big Data"
https://github.com/yangycpku/macro_ML/tree/master/Notes
4. Kelly, B. and Xiu, D., (2023), Financial machine learning.
https://bfi.uchicago.edu/wp-content/uploads/2023/07/BFI_WP_2023-100.pdf
5. Campbell, J.Y., 2017. Financial decisions and markets: a course in asset pricing. Princeton University Press.
6. Cochrane, J., 2009. Asset pricing: Revised edition. Princeton university press.
7. Hens, T., and M. O. Rieger (2010): Financial Economics: A Concise Introduction to Classical and Behavioral Finance, Springer.
8. Hastie, T., Tibshirani, R., Friedman, J.H. and Friedman, J.H., 2009. The elements of statistical learning: data mining, inference, and prediction. New York: springer.

Exams:

There will be a closed-book midterm exam on April 25th during class. You need a serious excuse (illness etc.) to miss this midterm. The result of the midterm will count as 40% of the final grade. The closed-book final exam is on June 20th and will count as 60% of the final grade. There is no retake of the exams.

Homework:

Even though not counted for the final grade, regular homework completion is crucial for exam preparation and is highly recommended. Beginning in the second week, weekly homework is due every Sunday by 11:59 PM Zurich time. You can submit your solutions in the task block on OLAT. Although you may collaborate with a team of up to three people, you should submit your own solutions. Please include your team members' names at the start of your submitted work. To acknowledge consistent effort, students submitting over 80% of the homework will be **invited to a semester-end luncheon** (limited to the first 20 qualifiers). I look forward to potentially reaching this limit and celebrating your dedication.

Office hours:

Instructor: by appointment at https://calendly.com/yangycpku/afe (usually in the morning before my lectures)
TA: by appointment via email.

Feedback:

I welcome your active participation and value your input on the course. Feel free to suggest adjustments to the teaching pace or materials at any time. You may contact me and the teaching assistants directly via email or use the provided Google Form https://forms.gle/kgqpd8EJ74hhVYzo6 for anonymous feedback. We will review

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your suggestions weekly, ensuring that your voice is heard and acted upon throughout the semester.

Structure of the Course:

1. Introduction, Stylized facts in finance

2. Consumption-saving model of risk-free interest rate (2 lectures)

3. Uncertainty, Risk, No-Arbitrage, Arrow Debreu security

4. Consumption-based asset pricing in complete markets (2 lectures)

5. Financial constraints and incomplete markets (2 lectures)

6. Basic econometrics and machine learning for finance

7. Linear models for financial prediction

8. Nonlinear models for financial prediction