

ECC3000: ADVANCED MICROECONOMICS – S1 2026

Meetings & Location

Monday 12-2pm (CL_16 Rainforest Walk, Room S4, Theatre (Bldg 25))

Wednesday 1-2pm (CL_14 Alliance Lane, Room E7, Theatre (Bldg 72))

Instructor.

Kate Huang

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Office: Room 309, Building 6, Clayton Campus

Office hours: 2-3pm (Monday)

(please send me an email if you plan to attend or to schedule an alternative time)

About.

The course will cover core concepts in microeconomic theory and provide an introduction to an active research area in economic theory.¹ We will start by examining individual decisions, covering preference, choice theory, and uncertainty, as well as how we rationalize individual choices and the implications of risk attitudes in decision-making. We then move on to group decisions, introducing social choice theory, where we will discuss applications to voting and ranking aggregation. Lastly, we will take a social planner's perspective to explore how one can design a system to achieve greater efficiency and balance welfare while taking into account the incentives of economic agents.

Goals.

The course will teach you the fundamental building blocks and insights economists use to understand economic decisions and formally model the forces that underpin them. You will learn the language and models needed to formulate these problems, along with the mathematical tools to solve them. By the end of the course, you will be able to follow most talks at a theory seminar and start developing your own research questions on these topics. Looking ahead, you will be well-prepared to pursue more advanced microeconomic courses at the honours or even PhD level.²

Prerequisites.

Date: March 4, 2026.

¹In fact, computer scientists are also thinking about similar problems, as this area lies at the intersection of economic theory and computer science.

²Thinking of doing Honours in Economics or further Graduate studies (PhD at Monash or overseas), send me an email, and I'd be happy to chat more about your future opportunities.

The prerequisite course is ECC2000; other than that, the course has no formal prerequisites. In particular, it does not require prior knowledge of economics. However, familiarity with mathematical concepts such as calculus (derivatives, integration, and vectors), set theory, and basic skills in writing mathematical proofs will be extremely useful. A basic understanding of probability theory, including random variables, distributions, independence, and Bayes' rule, will also be beneficial. If these concepts are unfamiliar to you, I will explain them in class whenever needed.

Grading.

The final grade consists of three parts:

- (1) 3 problem sets, 10% each (30%)
- (2) a mid-term test (35%)
- (3) a final exam (35%)

Students will collaborate on these 3 problem sets. Here are the rules for collaboration.

- I have randomly assigned you to a group of three (some groups of two or four may be allowed to accommodate everyone).
- Each student is expected to first attempt all the problems individually, and then meet as a group to discuss and arrive at a consensus solution for each problem.
- Different groups may discuss the problems verbally but not exchange written solutions.
- Each group should hand in a single consensus solution to the problem set, preferably typeset using LATEX. It is expected that all group members contribute equally to the final solution.
- Collaboration on exams/tests is strictly prohibited, as is the use of any external materials or tools not explicitly permitted by the instructor.

Reading.

All relevant material is covered in the lectures and provided in handouts, with additional resources referenced wherever appropriate.

Outline.

The following is a tentative outline. The final list of topics to be covered will depend on students' interests and the pace at which the class progresses through the material.

- (1) **Choice Theory** (3 weeks): preference and choice (binary relation), utility function, weak axiom of revealed preference, utility representation, properties of preferences, demand, duality.
- (2) **Uncertainty** (3 weeks): expected utility, lotteries and risk, st. Petersburg paradox, representation and axioms, risk attitudes, absolute/relative risk aversion, risk

- comparison (Arrow-Pratt index), risk premium. Maybe: local comparisons of risk (stochastic orders)
- (3) **Social Choice Theory** (2 weeks): the normative approach, May's theorem, condorcet paradox, scoring rules, impossibility results (Arrow & Gibbard-Satterthwaite). Maybe: computational complexity in social choice
- (4) **Allocation, Market and Fair Division** (4 weeks): First and second welfare theorems, auction theory, pareto-optimality, first/second welfare theorem, envy-freeness, truthfulness, matching with transfers, matching without transfers. Maybe: cake-cutting

TABLE 1. Course Schedule

Week	Topic	Assessment	Date
1	Intro / Choice and Preferences	PS 1 (Out)	Mar 9
2	Choice and Preferences		
3	Choice and Preferences	PS 1 (In)/PS 2 (Out)	Mar 19/Mar 23
4	Uncertainty / Risk		
5	Uncertainty / Risk	PS 2 (In)	April 2
6	Uncertainty / Risk		
7	Social Choice Theory	Mid-Term Test	Due: April 23
8	Social Choice Theory		
9	Allocation, Market and Fair Division	PS 3 (Out)	May 4
10	Allocation, Market and Fair Division		
11	Allocation, Market and Fair Division	PS 3 (In)	May 14
12	Allocation, Market and Fair Division / Review	Final Test	Due: June 11

Important timing information.

- We will meet in person twice a week for 12 weeks (from Mar 3 to May 30). The first meeting is about 2 hours, and the second is about 1 hour. The in-person meetings will not be recorded.
- Problem sets are roughly equally spaced. You will have about 10 days to work on each problem set.
- Your mid-term test will take place hopefully after we finish the first two topics by April 23.
- Your final test will take place during the final assessment period: June 9–27; tentative by June 11.
- All tests will be take-home exams. You can choose when to complete the test within a certain window.