Faculty of Business and Economics
Department of Economics

ECON90003

Macroeconomics

March 2019

Chris Edmond

Office hours:	Wednesdays 14:30–15:30 or by appointment	Office:	FBE 423
		Phone:	8344 9733
		Email:	cedmond@unimelb.edu.au

Course description

This is an advanced course in macroeconomic theory intended for first-year PhD students or final-year masters students. The first part of the course will cover dynamic programming theory and applications in both deterministic and stochastic environments and will develop tools for solving such models on a computer using MATLAB (or JULIA, if there is sufficient interest). The second part of the course will focus on various extensions and further applications, including consumption-savings problems, job search, asset pricing, and models with heterogeneous households and firms.

Course material

There is no required text for the course. But if you would like to use a text to supplement the class notes, the best fit for this course is:

- ◇ Ljungqvist and Sargent (2018): *Recursive Macroeconomic Theory*. 4th Edition. MIT Press.

A closely related set of material is available on the Quantitative Economics website by Sargent and Stachurski. The following books are also useful, especially for the first half of the course:

- ◇ Miranda and Fackler (2002): *Applied Computational Economics and Finance*. MIT Press.
- ◇ Stokey and Lucas with Prescott (1989): *Recursive Methods in Economic Dynamics*. Harvard University Press.

Finally, the course will also draw on various journal articles and working papers. I will post copies of these articles and all other course material to the LMS.

Assessment

The grade for this course will be based on:

Task	*Due date*	*Weight*
Problem set #1	in class, Tuesday March 26	5%
Problem set #2	in class, Tuesday April 16	5%
Problem set #3	in class, Tuesday May 14	5%
Problem set #4	in class, Tuesday May 28	5%
Mid-semester exam	in class, Wednesday April 17	30%
Final exam	exam block	50%

Problem sets. There will be four problem sets over the course of the semester. The problem sets may be done in groups subject to the following rules: All members of a group submit a single solution and will be given the same mark. No more than four students may make up a group. Students may choose to work and hand in an assignment on their own. No two groups may hand in the same assignment. All students in a group should be in the same tutorial.

Mid-semester exam. There will be a 90-minute closed-book mid-semester exam covering the first six weeks of the course to be held in class on Wednesday April 17.

Final exam. There will be a three-hour closed-book final exam covering the whole course.

Timetable

Lectures:

Tuesdays	15:30−17:00	200 Berkeley Street 219 (Theatre 2)
Wednesdays	15:45−17:15	The Spot 5008

Tutorials:

Fridays	15:15−16:15	Alan Gilbert G20

The tutor for this course will be Omid Mousavi ⟨mousavis@student.unimelb.edu.au⟩.

Lecture Schedule

Lectures 1–2.

Introduction and course overview. Review of the neoclassical growth model in discrete time. Sequence problem. Euler equation. Qualitative dynamics.

Lectures 3–8.

Dynamic programming methods. (i) Deterministic dynamic programming: value functions and Bellman equations, contraction mappings, characterizing value functions, policy functions, etc. (ii) Stochastic dynamic programming: Markov chains, invariant distributions, stochastic Euler equations, etc. (iii) Practical dynamic programming: value function iteration, numerical integration, function interpolation and approximation, solving Bellman and Euler equations, etc.

- ◇ Ljungqvist and Sargent, chapters 2, 3 and 4 and appendix A.
- ◇ Stokey and Lucas with Prescott, chapters 2, 3, 4 and 5.

Further reading on computational issues:

- ◇ Miranda and Fackler, chapters 5, 6 and 9.

Lectures 9–12.

Dynamic programming applications. (i) Consumption-savings problems, permanent income hypothesis revisited, implications of borrowing constraints etc, (ii) job search and matching etc, (iii) consumption-based asset pricing, stochastic discount factors, etc.

- ◇ Ljungqvist and Sargent, chapters 6 and 13

Lecture 13.

Mid-semester exam review session.

Lecture 14.

Mid-semester exam. To be held in class on Wednesday April 17.

Lectures 15–16.

Complete-markets general equilibrium. Arrow-Debreu and sequential trading arrangements, contingent claims and state prices, aggregate vs. idiosyncratic risk, risk-sharing, etc.

- ◇ Ljungqvist and Sargent, chapters 7, 8 and 12.

Lectures 17–19.

Incomplete markets. General equilibrium with heterogenous agents and incomplete markets: Huggett and Aiyagari models with idiosyncratic risk only, Krusell-Smith model with idiosyncratic and aggregate risk, implications for wealth inequality. Self-insurance, transitory vs. persistent shocks, life-cycle considerations, etc.

- ◇ Ljungqvist and Sargent, chapters 17 and 18

Further reading:

- ◇ Aiyagari (1994): Uninsured idiosyncratic risk and aggregate saving, *Quarterly Journal of Economics.*
- ◇ Krusell and Smith (1998): Income and wealth heterogeneity in the macroeconomy, *Journal of Political Economy.*

Lectures 20–21.

Firm dynamics. Firm heterogeneity and the size distribution of firms. Hopenhayn model with idiosyncratic risk, entry and exit. Job turnover and costly labor adjustment. Misallocation.

- ◇ Hopenhayn (1992): Entry, exit and firm dynamics in long run equilibrium, *Econometrica.*

Lectures 22–23.

'Behavioural' macro. Non-stationary dynamic programming, quasi-hyperbolic discounting, temptation and self-control etc.

- ◇ Laibson (1997): Golden eggs and hyperbolic discounting, *Quarterly Journal of Economics.*

Lecture 24.

Summary and final exam review session.