

Macroeconomics 1

General introduction

Olivier Loisel

ENSAE

September – December 2023

Outline of the general introduction

- 1 General overview
- 2 Practical issues

Goal of the course

- This course presents the fundamentals of micro-founded macroeconomic models.
- It addresses two main themes:
 - growth theories (5 chapters out of 7),
 - the effects of fiscal policy (2 chapters out of 7).
- It addresses these themes using models with
 - continuous time,
 - a representative agent or overlapping generations.
- It pays particular attention to normative questions about
 - the Pareto-optimality of market equilibria,
 - the role of economic policies.

Outline of the course

- General introduction
- Part 1: Exogenous growth theories
 - Ch. 1: The growth model with an exogenous saving rate (Solow-Swan)
 - Ch. 2: The growth model with an endogenous saving rate (Cass-Koopm.-Ramsey)
 - Ch. 3: The DICE model (Nordhaus)
- Part 2: Endogenous growth theories
 - Ch. 4: The growth model with learning by doing (Romer, 1986)
 - Ch. 5: The growth model with product variety (Romer, 1990)
- Part 3: Effects of fiscal policy
 - Ch. 6: Fiscal policy in the representative-agent model (Cass-Koopmans-Ramsey)
 - Ch. 7: Fiscal policy in the overlapping-generations model (Weil)
- General conclusion

Examples of topics addressed in lectures and tutorials

- Income and wealth inequalities across countries (C1-C2, C4-C5, T1-T2)
- Growth and climate change (C3)
- Exploitation of non-renewable natural resources (T3)
- Taxes and subsidies (C3-C5, T4-T5)
- Patents (C5, T5)
- Effects of public debt (C6-C7, T6)
- Pay-as-you-go and funded pension systems (C7)

A “fundamental” maths-based macroeconomics course

- This course is “fundamental” in the sense that it is a prerequisite for other, more applied courses (in Y2-S2 and in Y3).
- It is based on mathematical representations of the economy.
- The role of mathematical modeling is twofold:
 - ① clarify the argumentation and highlight the mechanisms at work,
 - ② obtain quantitative results whose empirical validity can be tested.
- This mathematical modeling is very simple and leaves aside many features of reality in order to highlight the key mechanisms.

Main maths-based macroeconomics courses at ENSAE

Y-S	Track	Title	Prof.	S/L	C/O	M/M	C/D/S
Y1-S2	CCS**	Intro à la macro	Loisel, Malherbet	S,L	C,O	M, M	S,D
Y2-S1	CCS**	Macro 1	Loisel	S,L	C	M	C
Y2-S2	CCS	Macro 2: fluct.	Malherbet, Winant	S	C,O	M	D
Y3-S1	EPD*	Monetary econ.	Loisel	S	C	M	D
Y3-S1	EPD*	Environm. econ.	Bourgeon	L	C	M	C
Y3-S1	EPD*	Labor econ.	Malherbet, Rathelot	S	C	M	C
Y3-S2	EPD*	Applied macro...	Campagne, Vermandel	S	C	M	D

Y: year. S: semester. CCS: common-core syllabus. EPD: Economic Policies and Dynamics. **: mandatory course.

*: semi-mandatory course. S/L: short/long-term analysis. C/O: closed/open-economy models. M/~~M~~: micro-founded/non-micro-founded models. C/D/S: dynamic continuous-time/dynamic discrete-time/essentially static models.

A micro-founded macroeconomics course I

- This course rests on **micro-founded** models, taking explicitly into account
 - agents' preferences,
 - technological constraints.
- Micro-founded models have the double advantage of
 - being less sensitive to Lucas' (1976) critique,
 - enabling one to evaluate the desirability of economic policies from a social-welfare point of view, i.e. using agents' preferences.

A micro-founded macroeconomics course II

- **Lucas' critique** \equiv one cannot predict the effect of economic-policy changes only on the basis of past correlations, as the economic-policy changes modify these correlations by modifying agents' behavior.
- **Robert E. Lucas, Jr.:** American economist, born in 1937 in Yakima, deceased in 2023 in Chicago, professor at the University of Chicago from 1974 to 2023, laureate of the Sveriges Riksbank's prize in economic sciences in memory of Alfred Nobel in 1995 "*for having developed and applied the hypothesis of rational expectations, and thereby having transformed macroeconomic analysis and deepened our understanding of economic policy*".
- Micro-founded models enable one to forecast the effect of economic-policy changes as a function of (preference, technology) parameters that are considered as unaffected by this change.

A micro-founded macroeconomics course III

- Because of the intertemporal nature of agents' preferences, micro-founded models are **dynamic** and require the use of optimal-control theory.
- In this course, we use **continuous-time** dynamic modeling, as it is more suited to the presentation of growth theories than discrete-time dynamic modeling.

Typical chapter outline

- 1 Introduction
- 2 Equilibrium conditions
 - behavior of households, firms, and the government
 - market clearing
- 3 Equilibrium determination
 - steady state
 - equilibrium path
- 4 Positive implications
 - effect of a structural change
 - effect of fiscal policy
- 5 Normative implications
 - (non-)optimality of the equilibrium
 - implementation of the optimal equilibrium
- 6 Conclusion

Availability of teaching materials

- There are **13 lectures** and **11 tutorials**.
- **Availability in electronic version** on Pamplemousse of:
 - references: from the start of the year,
 - course slides: from the start of the year,
 - questions and answers of the last three mid-term exams and the last three final exams: from the start of the year,
 - tutorial questions: at the latest one week before the tutorial,
 - tutorial answers: at the latest one week after the tutorial,
 - answers of the mid-term exam: one day after the exam,
 - answers of the final exam: at the latest one week after the exam.
- **Availability in paper version** of:
 - course slides: at the 3rd lecture (Tuesday 26 September at 15:15), for the students who will ask them (following the message I will send just after the first lecture).

Economic-growth textbooks

Code	Textbook	E/F
A	Acemoglu (2009)	E
AH1	Aghion and Howitt (1998)	E
	Aghion and Howitt (2000)	F
AH2	Aghion and Howitt (2009)	E
	Aghion and Howitt (2010)	F
BSM	Barro and Sala-i-Martin (1996)	F
	Barro and Sala-i-Martin (2004)	E

E/F: English/French.

General macroeconomics textbooks

Code	Textbook	E/F
BF	Blanchard and Fischer (1989)	E
H	Hairault (2000)	F
HP	Heijdra and van der Ploeg (2002)	E
R	Romer (1997)	F
	Romer (2011)	E
W	Wickens (2008)	E
	Wickens (2010)	F

E/F: English/French.

Correspondence between course and closest textbooks

Textbook chapters corresponding to course chapters:

Course	AH2	BSM	H	HP	R
1	1	1	11	14	1
2	1	2	16	14	2
4	2	4	17	-	3
5	3	6	-	-	-
6	-	-	-	14	2
7	-	-	-	14	-

Grading I

- Macroeconomics 1: one of the two courses in the UE “Economic Fundamentals” (with Microeconomics 1).
- Final grade = $\frac{2}{3}$ *(final-exam grade) + $\frac{1}{3}$ *(continuous-assessment grade).
- Final exam:
 - written, 2 hours, no documents allowed,
 - course questions and problem(s) “inspired” by course and tutorials,
 - as a reminder, the questions and answers of the final exams of the last three years are available on Pamplémousse.
- Continuous-assessment grade = $\frac{1}{2}$ *(mid-term-exam grade) + $\frac{1}{4}$ *(attendance grade) + $\frac{1}{4}$ *(participation grade).

Grading II

- Mid-term exam:
 - written, 1 hour and 15 minutes, no documents allowed,
 - question(s) and exercise(s) very close to course and tutorials,
 - scheduled for Friday 27 October at 08:30 (to be confirmed),
 - as a reminder, the questions and answers of the mid-term exams of the last three years are available on Pamplemousse.
- Attendance grade: 20/20 if you attend all tutorials.
- Participation grade: depends on your participation during tutorials
 - at the board,
 - from your place.

Whom to ask questions

- Your tutorial teacher.

- Chloé Saurel, coordinator of macroeconomics courses and of the EPD track:
 - office 3107 (with or without appointment),
 - `macroeconomie@ensae.fr`.

- Olivier Loisel, professor of macroeconomics, in charge of the EPD track:
 - during or just after lectures,
 - office 4039 (by appointment),
 - `olivier.loisel@ensae.fr`.