This course aims at introducing the main heterogeneous agent models used in the macroeconomic literature. The lectures will mainly focus on modelling, giving particular attention to mechanisms and economic intuitions. Classical and recent theoretical articles will be discussed (see reading list below). Basic of maths, optimization and probability theory (stochastic processes and Markov chains) will be covered in TA sessions, as well as problem sets and discussion about the articles.

**Syllabus (subject to changes)**

**Part 1 : Introduction and classical models**

1°) Introduction: basic facts of aggregation in macroeconomics
Heterogeneity of agents: Household (Inequality) and Firms
Introduction to the main ideas of incomplete markets models (Pricing kernels, risk sharing etc.)

2°) Foundations: classical credit constraints and incomplete insurance markets models :
- Debt, Collateral constraint & Financial multiplier (Bernanke Gertler 1989)
- Holmström and Tirole QJE (1997)
- Advances in dynamic models: Kiyotaki and Moore JPE (1997)
- Credit constraint in DSGE: Bernanke Gertler Gilchrist (1999), Iacovello (2005)

3°) A primer on incomplete markets models
- Woodford AER (1990) - Public debt as Liquidity
- Mankiw JFE (1986) - Concentration and correlation of shocks
- Money supply in standard OLG model

4°) “Equity premium puzzle”
- Potential solutions: habit formation et disaster events

**Part 2: Incomplete markets and Household heterogeneity**

5°) « Classical » models of HA (Heterogenous agents):
- Bewley (1983) – Theory of money
- Huggett JEDC (1993) – Risk free rate
- General framework, Miao (Economic dynamics Textbook - Chapter 17)
- Definition of equilibrium in this type of models
- Incomplete market and uninsurable risks: Aiyagari QJE (1994)
6-7-8°) Reduced-heterogeneity representations
- No trade equilibria - Krusell Mukoyama Smith (2011), Ravn Sterk (2016 - HAM and SAM)
- Truncation – Challe-Matheron-Ragot-Rubio Ramirez (2016)

9°) HA models with aggregate uncertainty
- Krusell-Smith (1998) – techniques & computation

10°) HANK (Heterogeneous agents New Keynesian models) and economic policy

Part 3 - If time permits – Topics

11°) Topics in macroeconomics with heterogeneous agents
- Auclert 2016, Farhi Werning 2017, McKay Steinsson Nakamura 2015

12°) Optimal policy and distortion in incomplete market model
- Davila-Hong-Krusell-Rios Rull (2012 - Econometrica)

13°) Recursive contracts in macro models
- Marcet & Marimon (2011)

Grading:

- **Tests – 25%**
  During the TA sessions, 4 or 5 tests will be based on the readings (for sure: Woodford, Mankiw, Kiyotaki Moore, Bewley, Huggett, Aiyagari, Krusell Smith, and maybe other articles based on the content of the lecture) Exact list and dates will be given in September

- **Homework – 10%**
  1 Problem set given in week 1 (for week 3) based on the content of “Macro 2”: RBC models, NK-DSGE models

- **Referee report – 25%**
  (List of papers given in week 7/8 for a date in December) Based on a recent theoretical article (see below)

- **Final exam – 40%**
  2 parts: 1 open question based on the lectures, 1 or 2 problem sets based on the models seen in class and in TA sessions
**Reading list:**

Readings are compulsory. The models and results of these papers will be discussed in class and TA sessions. Tests based on the papers will be organized during TA sessions.


Campbell, J.Y. (1999), Asset Prices, Consumption, and the Business Cycle, in Handbook of Macroeconomics, Volume 1C.


**Surveys (summarizing the large literature)**


Referee report

Light and comprehensive referee report 3-4 pages.

Intro (1 page)
- What is the research question, the topic: large introduction, linked with the course as much as possible
- the literature: what other people tried to do, could not do, why this paper is bringing something

Model, (around 1 page, less if possible)
- what is the model about, is it a standard model? extended? brand new? why is it innovative?
- what is the setting? (briefly! mostly non-technical, you may state 2-3 equations to have an idea)
- what are the main assumptions? (the assumptions are key!). If it is a quantitative/econometric model, what is the methodology?

Critics, discussion (less than 0.5 page)
- What are the pitfalls? tractability/transparency, highly dependent on parameters/functional forms, weird/unusual maths.
- Did it forget something? (be careful: macro models always forget 99,9% of things) what are the thing they could have forgot which would change the result?

Results (1 page)
- What are the results? what are the main mechanisms identified by this model?
- Conclusion (few sentences): briefly what did we learn, what is the descriptive conclusion, what are the policy implication and recommendation