Introduction to Macroeconomic Theory II
Spring, 2019
The City University of New York
The Graduate Center

Instructor: Lilia Maliar, Office 5313.01, lmaliar@gc.cuny.edu
Lectures: Wednesday, 14:00 pm – 17:00 pm.
Office hours: Wednesday, 12:30 pm – 13:30 pm.

Summary and objectives
This is the second and last GC CUNY core course on macroeconomics. The goal of the course is to provide the students with an overview of the most important and relevant tools of modern macroeconomic theory. The material is selected with the idea to serve as a basis for those students who specialize in macro, and to serve as a sufficiently broad and deep overview for those students who specialize in other areas and who need to use macro tools in their own research.

The course includes the following three parts.
1. In Part I, it acquaints the students with growth theory. Specifically, we first make a brief overview of topics on differential equations and dynamic optimization in continuous time, and we then present the major theoretical growth models and discuss their empirical relevance.
2. In Part II, we describe extensions of the standard neoclassical growth model, namely, we augment the benchmark representative-agent version of the model to include heterogeneity, incomplete markets, occasionally binding constraints, and demographics, among others.
3. In Part III, we cover modern monetary theory, namely, we study new Keynesian (NK) models by analyzing both representative-agent and heterogeneous-agent setups.

Learning goals and outcomes
1) Demonstrate good understanding of macroeconomic theory, including growth theory and monetary theory.
2) Describe the empirical evidence regarding these theories.
3) Develop some programming skills in MATLAB and Dynare.
4) Demonstrate the ability to find new research questions in light of existing theories.
5) Demonstrate the ability to design a theoretical model aimed at answering potentially interesting research questions in the field.
6) Develop writing skills consistent with the requirement of professional publications.

Prerequisites
1st semester of the 1st year Macroeconomics.

Assessment
The course grade will be based on
1. Individual problem sets (30%). These problem sets provide opportunities to bring lecture
material into practice. This assignment relates to learning goals 1), 2) and 3).
2. A midterm exam 1 (15%). The exam will cover the first part of the course, and it is related to learning goals 1) and 2).
3. A midterm exam 2 (15%). It will be a take-home exam in which each student will write a short research project. In particular, he/she will use the studied computational methods to analyze a student-specific macroeconomic model. This assignment is related to learning goals 3)--6).
4. A final exam (40%). The exam will cover the second and third parts of the course – growth theory, and it is related to learning goals 1) and 2).

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<thead>
<tr>
<th>ACTIVITIES</th>
<th>PERCENTAGES</th>
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<tbody>
<tr>
<td>Problem Sets</td>
<td>30%</td>
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<tr>
<td>Midterm Exam 1</td>
<td>15%</td>
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<td>Midterm Exam 2</td>
<td>15%</td>
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<tr>
<td>Final Exam</td>
<td>40%</td>
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Up to 5% bonus will be given for class attendance and participation.

**Texts**

Lecture notes and slides are the main material for the class. The following textbooks are also helpful (but not required):

**Topics**

**Introduction.**
Objectives of the course. Syllabus. Grading system.

**Part I. Growth Theory**

**1. Dynamic mathematical tools in continuous time.**
Differential equations. Dynamic optimization in continuous time.

**Primary:**
2. Dynamic models of investment.
The q theory of investment. Internal adjustment costs. External adjustment costs.

Primary:

Secondary:

3. The Solow-Swan (1956) growth model.
Introduction to growth: empirical evidence on cross-country disparity. The Solow-Swan model: the steady-state analysis; golden rule; transition; empirical testing; other production functions.

Primary:

Secondary:

4. The Ramsey (1928) growth model.

Primary:

Secondary:

5. Continuous-time stochastic optimization.

Part II. The Neoclassical Growth Model.
1. **A review of notions and concepts of economic dynamics.**

**Primary:**
- Lecture notes.

**Secondary:**

2. **Background on numerical techniques for solving dynamic economic models.**

**Primary:**

**Secondary:**

3. **Heterogeneous-agent models with complete markets.**
Heterogeneous agents (HA) models with complete markets. Aggregation and a representative consumer.

**Primary:**
4. Heterogeneous-agent models with incomplete markets.

Secondary:

Primary:

Secondary:

Part III. The New Keynesian (NK) Model.
1. Motivation: monopolistic competition and sticky prices.
Why a real-business cycle model with money in utility does not explain the regularities in the data. Monopolistic competition under flexible prices. A one-period model with sticky prices.

2. The NK model with Calvo pricing.
The log-linearized NK model. Positive analysis. Forward guidance. Critiques and extensions of the basic model. The NK Phillips curve in the data.

**Primary:**

**Secondary:**

3. A zero lower bound on nominal interest rates.
The NK model with a zero lower bound (ZLB) on nominal interest rates. Liquidity trap. Closed-form solutions.

**Primary:**

**Secondary:**

4. The NK model: optimal monetary policy.

**Primary:**

Secondary:

5. The two-agent heterogeneous NK models.
Monetary policy with HA.

Primary:

Secondary:

Concluding comments.
A brief overview of other potentially interesting topics not covered in class. Future of macroeconomics (large-scale central banking monetary models, large-scale fiscal policy models, machine learning, deep learning, supercomputers, among others).