

Syllabus - ECON60201

Macroeconomic Theory I (First-year PhD Macro)
Fall term 2024

Email: rbachman@nd.edu

Lecture: Mon/Wed 9:45am-11:45 am

Tutorial (Nan Jiang): Mon 5:30 pm-6:45 pm

Dropbox folder:

<https://www.dropbox.com/scl/fo/jky2b6fvr4c94dos7eq5l/ALLBfiETDISO-BrXVq8cshg?rlkey=01tbtogmx3w8cgzutir6ulxzw&st=6x8j71bh&dl=0>

Zoom Link:

<https://notredame.zoom.us/j/99292923832?pwd=paDRLIX1xazSKKQcNhYl9HfBVYPeO1.1>

Office hours:

Instructor: Rüdiger Bachmann

Office: Jenkins Nanovic Hall 3026

Jenkins Nanovic Hall 3060F

DeBartolo Hall 301

by appointment

Description:

This course is an introduction to modern macroeconomics. As such, it is very tool-oriented. It is part of a year-long introductory macroeconomics course, the second half of which is taught in the spring semester.

While this course – like any modern economics PhD program in the world – emphasizes theory and tools (so-called workhorse models), we also emphasize the applied and data-driven nature of most current research in macroeconomics, perhaps a bit more than other programs.

Following this premise, we begin with an extensive study of macroeconomic data and discuss simple practical tools for describing and analyzing them.

We then move on to macroeconomic model building; in this first half mostly in a decision-theoretic or partial equilibrium environment, to highlight basic economic mechanisms in consumption, asset pricing, investment, and the labor market. The course concludes with general equilibrium and an introduction to long-run analysis with the Solow growth model and the infinite-horizon neoclassical growth model. The spring semester then uses modified versions of these general equilibrium models to study business cycles, the role of money, nominal rigidities and monetary and fiscal policy. Along the way, we introduce many of the technical tools used by macroeconomic researchers: filters, vector autoregressions, Markov chains, dynamic programming, optimal control, calibration, perturbation methods, etc.

Throughout the year, we emphasize five elements that are important to modern macroeconomics: (i) macroeconomic data, (ii) the use of models, (iii) microfoundations, (iv) dynamic, intertemporal decision making, often under uncertainty and the role of expectations, and (v) the interdependence of individual decisions and macroeconomic phenomena.

It should be noted that although this is a PhD course in macroeconomics, we still make many simplifying assumptions in this course that are unrealistic or may seem far removed from reality, such as representative agents, complete markets, rational expectations, few or no frictions, and so on. But things are complicated, so the student of macroeconomics has to start somewhere. While this course is close to the state of the art in terms of many ideas and principles, it is not necessarily representative of the research *frontier* in macroeconomics. For example, we will not be able to talk much about problems of heterogeneity, incomplete markets and all the possible frictions that macroeconomists are currently studying (that is what second-year courses are for).

Goals:

By the end of the course, students should be able to read current macroeconomic research papers and have the tools available to replicate such research. They should also be prepared for the more research-oriented second-year macroeconomics courses that will help them develop their thesis topics.

Since this is a tool-oriented course, students will need to learn a mathematical programming language, for which I recommend Matlab. This is the language I have used in my research and will be able to provide some assistance. If you like other, similar programs, better, such as Julia, that is fine, too.

Study Material:

There is no single assigned textbook for this course. Instead, students will receive self-contained sets of lecture slides based on chapters from several standard textbooks:

- *Advanced Macroeconomics* by David Romer
- *Recursive Macroeconomics Theory* by Lars Ljungqvist and Thomas Sargent
- *Recursive Methods in Economic Dynamics* by Nancy Stokey and Robert Lucas with Edward Prescott
- *Lectures on Macroeconomics* by Olivier Blanchard and Stanley Fisher

I will point out more specific additional reading sources during the semester. The *Handbook of Macroeconomics* (<https://www.sciencedirect.com/handbook/handbook-of-macroeconomics/volumes>) in both volumes is also a good way to get a good introduction and overview of a particular topic. The first volume covers more traditional topics such as those we will be discussing in this course, while the second volume covers more recent developments in the field and the current research frontier.

Grades:

There will be 8 problem sets throughout the semester. While students may consult with each other in completing the problem sets (in fact, they are encouraged to do so), it is expected that each student turn in his/her own work. Students are asked to submit their solutions directly to our Dropbox folder by the date and time indicated at the top of each problem set (typed solutions are preferred, otherwise you will need to use a scanner).

Unless otherwise specified, the submitted solution file must be in PDF format and must be named: PSX_lastname (where X is the Arabic number of the problem set).

Exact due dates and times for the problem sets will be determined as the semester progresses. The problem sets will be graded using a check plus, check, check minus system. Suggested solutions will be provided. The right to grade with a zero is reserved, if no solution or mostly gibberish is submitted.

There will be an in-class midterm after chapter 2 on consumption (the exact date is to be determined). There will be an in-class final on our last day of class: December 11th (you may ignore any date assigned by the registrar).

Grade value of each assignment:

Problem sets:	10 percent
Midterm:	40 percent
Final:	50 percent

Academic Integrity:

Notre Dame students are expected to abide by the Academic Code of Honor Pledge.

"As a member of the Notre Dame community, I acknowledge that it is my responsibility to learn and abide by principles of intellectual honesty and academic integrity, and therefore I will not participate in or tolerate academic dishonesty."

In particular, this means for AI:

"With this in mind, remember that representing work that you did not produce as your own, including work generated or materially modified by AI, constitutes academic dishonesty. Use of Generative AI in a way that violates an instructor's articulated policy, or using it to complete coursework in a way not expressly permitted by the faculty member, will be considered a violation of the Honor Code."

Contact/Communication:

Email: rbachman@nd.edu

Dropbox folder:

<https://www.dropbox.com/scl/fo/jky2b6fvr4c94dos7eq5l/ALLBfiETDISO-BrXVq8cshg?rlkey=01ftbogmx3w8cgzutir6ulxzw&st=6x8j71bh&dl=0>

Office Hours: They are by appointment. They can be in person or online via Zoom. It is best to email me first to arrange a date and time. For Zoom meetings, we will use the official class Zoom meeting room.

Homepage: <https://sites.nd.edu/rbachman/>

Twitter: <https://twitter.com/BachmannRudi>

Tutorial:

Instructor: Nan Jiang

I strongly recommend attending the tutorial. The start date is September 2nd. It serves three main purposes: 1) to ask any questions left over from the lecture (it is recommended that students ask their immediate questions in the lecture but sometimes additional questions arise later, and while you should feel comfortable making an office appointment or a Zoom call with me to discuss them, the tutorial is meant to provide additional resources to help with questions); 2) to discuss issues that may arise with the current problem set, although the tutorial instructor will not solve the problem set for you; 3) to discuss common mistakes made on the previous problem set.

Dates where I cannot be in town:

September 18

September 23

September 25

Zoom taught

make-up class: September 2, 12:00-2:00 pm, JHN 3060F

make-up class: September 9, 12:00-2:00 pm, JHN 3060F

Macroeconomic Data and Simple Data Description Tools

- a. Importance of data for macroeconomics
- b. Sources of macroeconomic data
- c. Traditional business cycle peak-trough analysis, Bry Boschan procedure
- d. Filters
- e. The four canonical second moments: volatility, autocorrelation, correlation, dynamic cross-correlations
- f. Business cycle facts
- g. Higher moments and time-varying (second) moments
- h. Reduced-form VARs as data description tools
- i. SVARs, the identification problem and canonical solutions, Choleski, Long-run restrictions, sign restrictions
- j. AR processes and their approximation by Markov chains, properties of Markov chains

2. Consumption

- a. The canonical consumption-saving model under certainty, Euler equation and PIH
- b. Consumption under uncertainty, Random-Walk Hypothesis and Precautionary Saving
- c. Dynamic Programming
- d. Asset pricing (consumption CAPM, Lucas trees and stocks, the Arrow-Debreu economy)

MIDTERM

3. Investment

- a. The frictionless neoclassical investment model, user costs of capital
- b. Q-theory, smooth-convex adjustment costs
- c. Optimal control, Hamiltonians
- d. Real options theory of investment and non-convex adjustment costs

4. Labor Market and Unemployment

- a. Neoclassical labor supply and labor demand
- b. Search and matching: intertemporal search, an island model, DMP model

5. The Long-run / General Equilibrium

- a. The Solow growth model
- b. The neoclassical growth model
 - i. As a planner's problem
 - ii. As a decentralized economy

FINAL