

Economics 102: Macroeconomic Theory

Instructor: Dirk Krueger

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Office Hours: Mon. 12-1, Wed. 12-1, and by appointment.

Time of Class: Monday and Wednesday, 2:00pm-3:20pm.

Room: Stitler Hall B6

Teaching Assistants and Recitations:

Edvard Bakhitov: Recitations: F 10-11 (WILL 29) and F 12-1 (MCNB 309).

Office Hours: Friday 1.30-3.30pm in McNeil 538.

Hanbaek Lee: Recitations: T 11-12 (LRSM 112B) and F 9-10 (MCNB 167-8).

Office Hours: Thursday 9:30-11:30am in MCNB 476.

Jianhong Xin: T 9-10 (MCNB 167-8) and T 12-1 (LRSM 112B).

Office Hours: Tuesday 10:00-12:00 in MCNB 351.

Recommended Text: Stephen D. Williamson: *Macroeconomics*, 6th edition.

Web Page on Canvas: <https://canvas.upenn.edu/>

Course Outline and Overview

Economics 102 is the basic course in macroeconomic theory for undergraduate economics majors. It is centered around the idea that in order to understand the complex macro economy in the real world around us, we need to construct a simple laboratory (which we will call a model). This laboratory will help us to understand the data from the past, make predictions for the future, and analyze how the past and future is shaped by actual and hypothetical fiscal and monetary policies.

The two basic *methodological principles* we will stress when constructing our model is that a) the actors in our economy will act purposefully (households will maximize lifetime utility, firms will maximize the present discounted value of profits, and the government will maximize welfare in society -or the benefits of politicians) and b) the interaction of households, firms, the government and the rest of the world determines prices, wages and interest rates in general equilibrium.

We will use our model to discuss long-run economic growth and short-run business cycle fluctuations. Growth theory describes and explains how the main economic aggregates (such as output, employment, inflation, interest rates) evolve *on average* over long periods of time, whereas business cycle theories analyze the short-run movements of economic aggregates. Once we have understood how the macro economy works, we can start analyzing macroeconomic policy, in particular fiscal policy (what are the macroeconomic effects of taxation, government spending, budget deficits, or surpluses) and monetary policy (what happens if the Federal Reserve Bank increases or lowers interest rates (and more specifically, the Federal Funds Rate). The goal is that, by the end of the course, you can criticize articles on economic issues (in publications such as *The Economist*, the *Financial Times*, or the *New York Times*) using good model-based economic intuition and knowledge.

Organization of the Course

We will meet Monday and Wednesday from 2:00 - 3:20pm in Stitler Hall, room B6. The first day of class is Wednesday, January 10, 2018.

Prerequisites

Strict prerequisites for the class are Econ 1, 2, and 101 and Math 104 and 114 or 115 Since we will cover models at an abstract and advanced level, you **MUST** have the degree of mathematical maturity associated with the concepts of sets, functions, derivatives, integrals, Taylor series, optimization, and other material covered in Math 104 and Math 114/115. If you do not meet these requirements, you cannot take this class as you would not be able to handle its mathematical content.

Whenever possible I will stress the economic intuition, but sometimes it is necessary in economics to use mathematical tools to make a point more concisely. In an intermediate economics class in one of the premier universities in the world (i.e. Penn) we will not compromise on rigor of an economic argument just to avoid using the appropriate mathematics.

Instructor

A few words about myself: my name is Dirk Krueger. I am German and received my undergraduate degree and Masters degree in economics from the University of Bielefeld, Germany. In 1995 I came to the US for graduate studies in economics at the University of Minnesota. I received my Ph.D. in economics in August 1999. Then I accepted a position as Assistant Professor in the Economics Department at Stanford University in September 1999 which I held until August 2003. After spending the academic year 2003-04 as Assistant Professor at the Economics Department of the University of Pennsylvania I went back to Frankfurt, Germany for 2 years, before returning back to UPenn in 2006 as Associate Professor of Economics. Since 2008 I have been a Full Professor here at Penn. I served as the Department's chair from 2014 to 2016. My own research focuses on the macroeconomic implications of fiscal policy, in particular taxation, social security and health care.

Your success in this class is important to me. Therefore I want to be available for your questions as much as possible. You can always ask questions in or after class. In addition I will hold regular office hours at the times listed above in my office 511, McNeil Economics Building. I am also available for office hours by appointment. You can also reach me via phone at (215) 573-1424 or via email at dkrueger@econ.upenn.edu. I usually answer questions via email by the end of the day, but typically not earlier than that.

Furthermore you will have access to three excellent TA's, Edvard Bakhitov, Hanbaek Lee and Jianhong Xin. Their own research focuses on macroeconomics as well, and you will find them of highest importance for your success in this class. They will hold recitation sessions that will review class material as well as solve practice problems, and occasionally discuss new topics that complement the course material.

Readings

The most important material for this class is the set of **slides and homeworks** I will post regularly on the Canvas web page for the class. You should know how to use Canvas to access this material. The Library provides tutorials and help in case you are not familiar with this website.

Since I will present a unified framework and notation to discuss all the topics in the class, I suggest to use my slides as the main study element. I will also upload a set of (unfortunately still incomplete) **notes**, with consistent notation, as a reference for further reading. These notes will eventually become a book that my colleague Jesus Fernandez-Villaverde and I am scheduled to publish with Princeton University Press.

Even though there are no *required textbooks* for this class, I match most covered topics with chapters of Stephen Williamson's *Macroeconomics*, 6th ed. Therefore I list this book as a

recommended text. Although the Williamson textbook is not required reading (meaning midterms will not include concepts that were not introduced in class and were not covered in the slides or homeworks) I encourage you to consult the book, in order to understand the material from a broader perspective. This is especially true if you find the slides unclear (and if neither I nor the TA's can fully clear up your confusion).

Finally, please try to keep informed about what is going on in the economic world by reading **articles** published in publications such as *The Economist*, the *Financial Times*, or the *New York Times*. I will try to address current economic events from time to time, and discussing them is much more productive if you have heard about the news beforehand.

Course Requirements and Grades

Your grade will be determined based upon your performance in 3 homeworks and three midterms. The homeworks together make up 75 points (25% of your grade), and each midterm makes up 75 points (25% of your grade). See the following Table 1

Table 1

| | | |
|-----------|------|------------|
| Homework | 25% | 75 points |
| Midterm 1 | 25% | 75 points |
| Midterm 2 | 25% | 75 points |
| Midterm 3 | 25% | 75 points |
| Total | 100% | 300 points |

Homeworks

Each homework will be worth 25 points. There are 3 homeworks. The following rules regarding homeworks apply and will be strictly enforced without exceptions.

1. Homeworks will be available on the course web page. I will indicate in class and via email when I have posted a new homework. The due date of the homework will be stated on the homework. In order to receive a passing grade in the course, all three homeworks have to be handed in.
2. Homeworks are due at the specified date *in class* (i.e. I will collect them at the end of class). Alternatively they have to be in my mailbox, McNeil 160, by *3:00pm* on the same day. **Late homework will not be accepted** and you will not get any credit for late homeworks. If you cannot make it to class, please make prior arrangements for your homework to be delivered on time.
3. If you have complaints about the grading of a problem set, do the following: **Within 1 week** after the problem set was returned hand back to me your graded homework and a **written** statement explaining your complaint (i.e. stating which question you think was graded wrongly and why you think it was graded wrongly). I will then regrade the whole assignment. Note that there is no guarantee that, after the homework has been regraded, your score will be higher than before and it may be lower. A week after a problem set has been returned the scores cannot be changed anymore and no further complaints will be accepted. The same policy applies to complaints of the midterms as well.
4. I encourage you to work in groups on the homeworks (but not the exams, of course). However, everybody has to hand in his/her own, uniquely written assignment. Two students that hand

in identical assignments will receive half of the score each. Note that my exams will be similar to my problem sets, so you would hurt yourself by not working out the problems by yourself.

Midterms

There will be three midterms examinations for this class, on the dates specified below (if you wish you can call the last midterm a final, but I do not think of it in that way). The midterms will each count 75 points (25% of your grade). The midterms are not cumulative, that is, only cover the material from part of the course. Attendance for all three midterm exams is mandatory, and I will offer makeup exams only for students that miss a midterm with a valid excuse. The department policies specify the valid excuses for missing an exam. These department course policies can be found here:

<http://economics.sas.upenn.edu/undergraduate-program/course-information/guidelines/policies>

Grades

Students taking the course for a letter grade will receive grades from A through D or an F. Students that take the class on a Pass/Fail basis need at least a D to pass the class. Note that poor performance is not a valid reason for an incomplete (I). The departmental course policies (see the link above) provide the exact conditions under which an incomplete can be given. They can also be found here: Grades will be assigned based on the cumulative score of points attained in homeworks and exams. Table 2 shows how a certain score of points translates into a letter grade.

Table 2

| Points Achieved | Letter Grade |
|-----------------|--------------|
| 285 - 300 | A + |
| 270 - 284.5 | A |
| 255 - 269.5 | A - |
| 240 - 254.5 | B + |
| 225 - 239.5 | B |
| 210 - 224.5 | B - |
| 195 - 209.5 | C + |
| 180 - 194.5 | C |
| 165 - 179.5 | C - |
| 150 - 164.5 | D + |
| 135 - 149.5 | D |
| less than 135 | F |

Note that I do not curve grades. If every student deserves a good grade, then I will only give good grades. But there is only one way of receiving a good grade in this class, and this is to earn it by working hard on the problem sets and preparing for the exams. Historically, my grade distribution does not deviate significantly from that of economics courses in which a curve is used. This means that I expect 30-40% A's, 40-50% B's and the rest C's or lower grades.

Contents of the Course

In Table 3 you can find a rough outline of the topics that I intend to cover, the associated readings and the dates when I intend to cover them. The list of topics may be revised during the course as I may not be able to cover all the material. Note that this course will be fairly intense and

it is absolutely crucial that you do not fall behind with your readings and assignments. In the table (W) stands for Williamson's textbook and (N) stands for my notes. Numbers stand for the corresponding chapter, so for example, W.3 represents chapter 3 in Williamson, and N.7.3-5 stands for sections 7.3 to 7.5 in my notes.

Table 3

| Date | Topic | Readings/Assignments |
|----------|------------------------------|-------------------------------|
| Jan. 10 | Introduction | N.1, W.1 |
| Jan. 17 | A Primer on Growth Rates | N.2.6, W.1 |
| Jan. 22 | NIPA I | N.2, W.2 |
| Jan. 24 | NIPA II | N.2, W.3 |
| Jan. 29 | Model: Households | N.4.1-2, W.4,W.9 |
| Jan. 31 | Model: Firms | N.4.3, W.4 |
| Feb. 5 | Model: Equilibrium | N.4.4-6, W.5 |
| Feb. 7 | Social Planner Solution I | N.5.1-2, W.5 |
| Feb. 12 | Social Planner Solution II | N.5.3, W.5 |
| Feb. 14 | Steady State and Dynamics | N.5.4 |
| Feb. 19 | Growth Facts | N.6, W.7, HW 1 due |
| Feb. 21 | | Midterm 1 |
| Feb. 26 | Neoclassical Growth Model I | N.7.1-2, W.7 |
| Feb. 28 | Neoclassical Growth Model II | N.7.3-5, W.7 |
| March 12 | Solow Growth Model | N.7.3.4, W.7 |
| March 14 | Growth Accounting | N.8.1, W.8 |
| March 19 | Balanced Growth Predictions | N.8.2, W.8 |
| March 21 | Transitional Dynamics | N.8.3, W.8 |
| March 26 | Endogenous Growth | N.9, W.8 |
| March 28 | Business Cycle Facts | W.3, HW 2 due |
| April 2 | | Midterm 2 |
| April 4 | Real Business Cycles I | N.12.1-2, W.13 |
| April 9 | Real Business Cycles II | N.12.3-9, W.13 |
| April 11 | Fiscal Policy I | N.15.1-3, W. 9 |
| April 16 | Fiscal Policy II | N.15.4, W. 9-10 |
| April 18 | Money I | N.16.1-3, W.12 |
| April 23 | Money II | N.16.4, W.12, HW 3 due |
| April 25 | | Midterm 3 |