

Economics 102: Macroeconomic Theory

Fall 2021: Syllabus

Instructor: Dirk Krueger

Office: PCPE 520

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Office Hours: Monday 3:30-4:30, Tues. 11-Noon, and by appointment

Course Delivery: 2 live lectures, Mondays and Wednesdays 1:45 - 3:15pm in the PCPE Auditorium (Ground Floor of PCPE)

Recitations: 1 recitation, various sections and times

Teaching Assistants and Recitations:

Collum Freedman: Recitations: Mon 8:30-9:30 (MCNB 410) and Mon 3:30-4:30 (PCPE 203).

collumf@sas.upenn.edu, Office Hours: Thurs. 2:00-4:00 in PCPE 628 (location subject to change).

Luigi Falasconi: Recitations: Fri 8:30-9:30 (MCNB 410) and Fri 10:15-11:15 (MCNB 285).

luigif@sas.upenn.edu, Office Hours: Fri. 11:30-1:30 in PCPE 648 (location subject to change).

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

Course Web Page: 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 act purposefully (households maximize lifetime utility, firms maximize the present discounted value of profits, and the government maximizes 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. In this part of the course we will also discuss the macroeconomic consequences of the COVID-19 crisis. 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 this course, you can critique 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

It is the current expectation of the university (and my sincere hope) that the course can be fully delivered in an in-person, live classroom setting, and this syllabus is based on this assumption. Since I taught this course in the fall of 2020 in an online format, I am of course prepared to switch to online mode should this prove necessary. In that case I will provide an updated syllabus.

Per the University's August 25 Message to the Penn Community on the Start of the Fall Semester, masks covering the nose and mouth must be worn at all times in all public indoor spaces, including classrooms, by all persons.

The first lecture will take place on September 1, and the first recitations will take place in the following week, that is, Friday, September 10 and Monday, September 13. The purpose of the recitations is to review material from class, to review the mathematical foundations required for the class, and to work through example problems to reinforce the material from class as well as to prepare students for the exams.

Prerequisites

Strict prerequisites for the class are Econ 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. The department's course requirements can be found here:

<https://economics.sas.upenn.edu/undergraduate/majors-and-minors/economics-major/course-requirements>

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, especially since it is a formal prerequisite for the class.

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 a tenured Associate Professor of Economics. Since 2008 I have been a Full Professor here at Penn, and in 2018 I was appointed Walter H. and Leonore C. Annenberg Professor in the Social Sciences. I served as the Department's chair from 2014 to 2016, and I am currently the lead editor of the *International Economic Review*, a leading scientific general interest journal that the University of Pennsylvania publishes in collaboration with the University of Osaka and Oxford University Press. My own research focuses on the macroeconomic implications of fiscal policy, in particular taxation, social security and health care, as well as the consequences of these policies on economic inequality.

Your success in this class is important to me. Therefore I will be available for your questions as much as possible. I hold regular office hours at the times listed above. I am also available for office hours by appointment. You can also reach me at dkrueger@upenn.edu. I answer questions via email by the end of the day, but typically not earlier than that. Finally, we will make use of Piazza through Canvas to provide an on-line Q&A platform for the class that the TA's will monitor.

Readings

The most important material for this class is the set of **slides, lecture notes and home works** that 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 **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 tests will *not* include concepts that were not introduced in class and were not covered in the slides or home works) 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 in my lectures, and discussing them is much more productive if you have heard about the news beforehand.

Course Requirements and Grades

Your grade will be determined exclusively based upon your performance in 3 home works and three midterms. The home works 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

Homework

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

1. Home works will be available on the course web page. I will indicate 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 home works have to be submitted.
2. Homework is to be submitted on Canvas, and is due on the specified date **at the end of regular class time at 3:15pm EST. Late homework will not be accepted** and you will not get any credit for late homework. You should aim to submit the homework before going to class to avoid your homework being delayed due to technical difficulties while sitting

in class. Since Canvas records the submission time of a file, it is unambiguous when your homework was submitted.

3. If you have complaints about the grading of a problem set, do the following: **Within 1 week** after the problem set was graded, send 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 any more 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 home works (but not the exams, of course). However, everybody has to submit his/her own, uniquely typed or 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. The midterms are in class exams and 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. All three midterm exams are mandatory, and I will offer make-up 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:

<https://economics.sas.upenn.edu/undergraduate/course-information/course-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. Grades will be assigned based on the cumulative score of points attained in home works 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 on-line lectures, 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
Sept. 1	Introduction	N.1, W.1
Sept. 8	A Primer on Growth Rates	N.2.6, W.1
Sept. 13	NIPA I	N.2, W.2
Sept. 15	NIPA II	N.2, W.3
Sept. 20	Model: Households	N.4.1-2, W.4,W.9
Sept. 22	Model: Firms	N.4.3, W.4
Sept. 27	Model: Equilibrium	N.4.4-6, W.5
Sept. 29	Social Planner Problem	N.5.1-2, W.5
Oct. 4	The Welfare Theorems	N.5.3, W.5
Oct. 6	Steady State and Dynamics	N.5.4-5, W.5
Oct. 11	Growth and Development Facts	N.6, W.7, HW 1 due
Oct. 13		Midterm 1
Oct. 18	Neoclassical Growth Model I	N.7.1-2, W.7
Oct. 20	Neoclassical Growth Model II	N.7.3-5, W.7
Oct. 25	Solow Growth Model	N.7.3.4, W.7
Oct. 27	Growth Accounting	N.8.1, W.8
Nov. 1	Balanced Growth Predictions	N.8.2, W.8
Nov. 3	Transitional Dynamics	N.8.3, W.8
Nov. 8	Endogenous Growth	N.9, W.8, HW 2 due
Nov. 10		Midterm 2
Nov. 15	Business Cycle Facts	W.3
Nov. 17	Real Business Cycles	N.12.1-9, W.13
Nov. 22	An Application to COVID-19	N.12.1-9, W.13
Nov. 29	Fiscal Policy I	N.15.1-3, W. 9
Dec. 1	Fiscal Policy II	N.15.4, W. 9-10
Dec. 6	Money	N.16.1-4, W.12, HW 3 due
Dec. 8		Midterm 3