Economics 2200: Intermediate Macroeconomics
Fall 2023: Syllabus

Instructor: Dirk Krueger
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Office Hours: Monday 3:30-4:30, Tues. 10:45-11:45, and by appointment
Course Delivery: 2 lectures, Mondays and Wednesdays 1:45 - 3:15pm in the PCPE Auditorium (Ground Floor of PCPE)
Recitations: 1 recitation for each student, various sections and times
Teaching Assistants and Recitations:
Shreemayi Samujjwala: Recitations: Mon 8:30-9:30 (MCNB 410) and Mon 3:30-4:30 (PCPE 202). shreem@sas.upenn.edu, Office Hours: Mon 4:30-5:30 in PCPE 500, Tu 3:00-4:00pm in PCPE 208
Ozgur Seker: Recitations: Fri 8:30-9:30 (MCNB 410) and Fri 10:15-11:15 (MCNB 285). oseker@sas.upenn.edu, Office Hours: Tu 1:00-2:00pm in PCPE 208, Wed 3:30-4:30pm in PCPE 141.
Recommended Text: Stephen D. Williamson: *Macroeconomics,* 6th edition.
Course Web Page: Canvas: https://canvas.upenn.edu/

Course Outline and Overview

Economics 2200 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 about the future, and analyze how the past and future is shaped by actual and hypothetical fiscal and monetary policies.

There are two basic *methodological principles* we will stress when constructing our model. First, the actors in the economy act purposefully (households maximize lifetime utility, firms maximize the present discounted value of profits, and the government, to the extent that it has an objective, maximizes welfare in society or the benefits of politicians running the government). Second, the interaction of households, firms, the government and possibly 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, short-run business cycle fluctuations and economic policy. Growth theory describes and explains how the main economic aggregates (such as per capita income, employment, inflation, interest rates) evolve *on average* over long periods of time, whereas business cycle theories analyze the short-run fluctuations of economic aggregates. In this part of the course we will also discuss the macroeconomic consequences of the recent financial and COVID-19 crises. 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 to inflation and the real economy (e.g., the unemployment rate) if the Federal Reserve increases or lowers 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 my expectation that the course can be fully delivered in an in-person, live classroom setting, and this syllabus is based on this assumption. The first lecture of this course will take place on

August 30, and the first recitations will take place in the following week, that is, Friday, September 8 and Monday, September 11. 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 home work and exams.

Prerequisites

Strict prerequisites for the class **are Econ 2100 and either Math 1070 and 1080, or Math 1400 and 1410 (or 1510)**. Since we will cover models at an abstract and advanced level, you MUST have the mathematical knowledge associated with the concepts of sets, functions, derivatives, integrals, Taylor series, optimization, and other material covered in the math courses stated above. 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 often 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. 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 reach me at dkrueger@upenn.edu. I typically answer questions via email by the end of the day, but typically not earlier than that.

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 university library provides tutorials and help in case you are not familiar with Canvas.

Since I will present a unified framework and notation to discuss all 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 hopefully and eventually become a book that my colleague Jesus Fernandez-Villaverde and I hope to publish with Princeton University Press in the near future.

Even though there are no *required* **textbooks** for this class, I match most covered topics with selected 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 (which means 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 TAs can fully clear up your confusion).

Finally, please try to keep informed about what is going on in the actual macro economy world by reading **articles** in publications such as *The Economist,* the *Financial Times,* or the *New York Times.* I will try to address current economic events (for example, when the FED changes interest rates) 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 Table 1

Home work	25%	75 points
Midterm 1	25%	75 points
Midterm 2	25%	75 points
Midterm 3	25%	75 points
Total	100%	300 points

Table 1: Assignments: Point Allocation

Home work

Each home work 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 home work. The due date of the home work will be stated on the home work. In order to receive a passing grade in the course, all three home works have to be submitted.

2. Home work 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 home work will not be accepted** and you will not get any credit for late home work. You should aim to submit the home work before going to class to avoid your home work being delayed due to technical difficulties while sitting in class. Since Canvas records the submission time of a file, it is unambiguous when your home work was submitted. You are responsible for insuring that you have reliable internet access so you can submit your home work 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 graded and gas been returned, send or give me your graded home work 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 assignment. Note that there is no guarantee that, after the home work 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 about the midterm grading 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. Please indicate on your home work whom you have collaborated with on the home work.

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 below shows how a certain score of points translates into a letter grade.

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 lecture attendance, readings and assignments. In Table 3, (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.

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

Table 2: Mapping between Points and Grades

Date	Topic	Readings/Assignments
Aug. 30	Introduction	N.1, W.1
Sept. 6	A Primer on Growth Rates	N.2.6, W.1
Sept. 11	NIPA I	N.2, W.2
Sept. 13	NIPA II	N.2, W.3
Sept. 18	Model: Households	N.3.1-2, W.4,W.9
Sept. 20	Model: Firms	N.3.3, W.4
Sept. 25	Model: Equilibrium	N.3.4-6, W.5
Sept. 27	Social Planner Problem	N.4.1-2, W.5
Oct. 2	The Welfare Theorems	N.4.3, W.5
Oct. 4	Steady State and Dynamics	N.4.4-5, W.5
Oct. 9	Growth and Development Facts	N.5, W.7, **HW 1 due**
Oct. 11		**Midterm 1**
Oct. 16	Neoclassical Growth Model I	N.6.1-2, W.7
Oct. 18	Neoclassical Growth Model II	N.6.3-5, W.7
Oct. 23	Solow Growth Model	N.6.3.4, W.7
Oct. 25	Growth Accounting	N.7.1, W.8
Oct. 30	Balanced Growth Predictions	N.7.2, W.8
Nov. 1	Transitional Dynamics	N.7.3, W.8
Nov. 6	Endogenous Growth	N.8, W.8, **HW 2 due**
Nov. 8		**Midterm 2**
Nov. 13	Business Cycle Facts	W.3
Nov. 15	Real Business Cycles	N.11.1-9, W.13
Nov. 20	An Application to COVID-19	N.11.1-9, W.13
Nov. 27	Fiscal Policy I	N.14.1-3, W. 9
Nov. 29	Fiscal Policy II	N.14.4, W. 9-10
Dec. 4	Money	N.15.1-4, 16, W.12
Dec. 6	Summary and Wrap-Up	**HW 3 due**
Dec. 11		**Midterm 3**

Table 3: Course Content and Calendar