

Economics 102: Macroeconomic Theory

Instructor: Dirk Krueger

Office: McNeil 511

Phone: (215) 573 1424

Email: dkrueger@econ.upenn.edu.

Office Hours: Tu. 12-1, Th. 3-4, and by appointment.

Time of Class: Tuesdays and Thursdays, 1:30 pm-2:50 pm.

Room: Stitler Hall B26

Teaching Assistants and Recitations:

Kian Samaee: Recitations: M 9-10am (MCNB 110) and M 2-3pm (MCNB 395).

Office Hours: W 1-3, McNeil 452

Chunzan Wu: Recitations: F 9-10am (WILL 218) and F 10-11am (MCNB 395).

Office Hours: F 12-2pm (MCNB 549)

Recommended Text: Stephen D. Williamson: *Macroeconomics*, 5th edition.

Web Page on Canvas: <http://www.library.upenn.edu/courseware/canvas/canvaslogin.html>

1. 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 fiscal and monetary policy.

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 between 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 the theory of long-run economic growth and short-run economic 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 theories of short-run fluctuations (business cycle theories) analyze the short-run movements of economic aggregates. Once we have understood how the macroeconomy 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 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 economic intuition and knowledge.

2. Organization of the Course

We will meet Tuesdays and Thursday from 1:30 - 2:50pm in Stitler Hall, room B26. The first day of class is Thursday, August 27, 2015.

3. Prerequisites

Strict prerequisites for the class are Econ 2, Econ 101 and one year of calculus. 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, ordinary differential equations, and other material covered in Math 104 and Math 114/115. If you do not meet these requirements, you cannot take this class.

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.

4. 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 am currently serving as the Economics Department's chair. 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 two excellent TA's, Kian Samaee and Chunzan Wu. 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.

5. 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 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*, 5th ed. Therefore I list this book as a recommended text. Although both my notes and the Williamson textbook are not required readings (meaning midterms will not include concepts that were not introduced in class and were not covered in the slides or homeworks) I strongly recommend their

reading to complement the lectures and slides, 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.

6. 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

6.1. 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.

6.2. 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 are appended to this syllabus and can also be found here:

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

6.3. 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 provide the exact conditions under which an incomplete can be given. They are appended to this syllabus and can also be found here:

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

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.

7. 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
Aug. 27	Introduction	N.1, N.2.6, W.1
Sept. 1	NIPA I	W.2
Sept. 3	NIPA II	W.3
Sept. 8	Model: Households	N.4.1-2, W.4,W.9
Sept. 10	Model: Firms	N.4.3, W.4
Sept. 15	Model: Equilibrium	N.4.4-6, W.5
Sept. 17	Social Planner Solution I	N.5.1-2, W.5
Sept. 22	Social Planner Solution II	N.5.3, W.5
Sept. 24	Steady State and Dynamics	N.5.4
Sept. 29	Growth Facts	N.6, W.7, HW 1 due
Oct. 1		Midterm 1
Oct. 6	Neoclassical Growth Model I	N.7.1-2, W.7
Oct. 13	Neoclassical Growth Model II	N.7.3-5, W.7
Oct. 15	Solow Growth Model	N.7.3.4, W.7
Oct. 20	Growth Accounting	N.8.1, W.8
Oct. 22	Balanced Growth Predictions	N.8.2, W.8
Oct. 27	Transitional Dynamics	N.8.3, W.8
Oct. 29	Endogenous Growth	N.9, W.8
Nov. 3	Business Cycle Facts	W.3, HW 2 due
Nov. 5		Midterm 2
Nov. 10	Real Business Cycles I	N.12.1-2, W.13
Nov. 12	Real Business Cycles II	N.12.3-9, W.13
Nov. 17	Fiscal Policy I	N.14.1-2, W. 9
Nov. 19	Fiscal Policy II	N.14.3-4, W. 9-10
Nov. 24	Money	W.12
Dec. 1	Monetary Policy	W.12
Dec. 3	Summary and Review	HW 3 due
Dec. 8		Midterm 3

Departmental Course Policies

Courses taught in the Department of Economics are covered by a common set of course management policies specified below.

Prerequisites

Please note that course prerequisites are strictly enforced by the Department. The fact that Penn InTouch lets you sign up for a course, does not mean you satisfy the prerequisites or that you are exempt from the prerequisites. We reserve the right to drop students from courses that they enrolled in if they do not satisfy the prerequisites. We will do so up until 72 hours before the course selection period ends.

Academic Integrity Issues

Academic integrity is a very important part of student life, and the Department of Economics takes it seriously. Please carefully read the [Guide for Students on Academic Integrity at the University of Pennsylvania](#).

If a student is found in violation of academic integrity, it is at the professor's discretion to give the student a failing grade for the assignment and/or the course. Students who are suspected of committing infractions will be reported to the Office of Student Conduct.

The department reserves the right to undertake procedures that would catch breaches of academic integrity, should any arise, such as photocopying or scanning midterms or other work before it is returned, and close proctoring during exams.

Exam Attendance

Courses have individual policies regarding midterm exam attendance. Final exam attendance is mandatory and is governed by a number of university regulations, see the Provost's [Rules Governing Final Examinations](#). Final exams can only be given on the exam date scheduled by the university registrar. No instructor can hold a final exam or require submission of a take-home exam except during the period in which final examinations are scheduled. No final exams may be scheduled during the last week of classes or on reading days. All students must be allowed to see their final exam, with an access period of at least one regular semester after the exam has been given.

In cases where attendance at a midterm or a final exam is mandatory, there are only a few valid excuses for missing an exam. They are:

- ▷ Three exams scheduled within one calendar day (for final exams ONLY!) This policy of 3 exams does not count for midterm exams given during class time.
- ▷ An exam is given outside of the regular class schedule and the timing conflicts with another class in which the student is enrolled.
- ▷ Observance of a university-recognized religious holiday.
- ▷ UPENN Business that takes you away from campus. Absence from campus on UPENN business includes, for example, athletic events in which you are actively participating. In such cases, you need to make arrangements with your professor ahead of the exam date to take the exam at another time (preferably earlier than the schedule date).
- ▷ An illness/health emergency.
- ▷ A death in your family.
- ▷ Documented disabilities that allow you to take the exam under other circumstances.

Examples of reasons that are **not** valid for missing an exam are:

- ▷ job internships;
- ▷ beginning fall or spring break early or returning after a scheduled exam;
- ▷ end of semester early flights;

any other reason you would prefer not to be at the university when the exam is scheduled.

It is at the discretion of the instructor to grant you permission to miss a midterm exam because of a conflict with a job interview. To petition such a permission you must provide documentation of the date, time, and location of the job interview.

Students are responsible for making sure, at the beginning of the term, that they can attend the exams. Registering for a course means that you certify that you will be present for the exam (unless one of the explicitly stated exceptions above arises.)

If you are unexpectedly ill at the time of the exam and unable to reach the instructor ahead of time, then you can give notification of your illness as soon as you are able. Do not take an exam if you are ill and then expect to have an opportunity to retake the exam because you were ill the first time and did poorly.

Students who arrive late to an exam will generally be required to hand in their exam at the same time as other students.

Course Absence Reporting

During the semester students are required to use the Course Absence Reporting (CAR) system to communicate with the instructor about course absences. CAR can be accessed using the [PennPortal](#). This is particularly important for missed exams/assignments. If a student has to miss an exam due to one of the valid reasons listed above, the student must notify the instructor via CAR as soon as possible and state the reason for her/his absence and provide an estimate of the time period in which (s)he is unable to fulfill her/his academic obligations. Note: making false statements when using CAR is considered a violation of academic integrity and, if discovered, will be reported to the Office of Student Conduct and may result in a failing grade.

CAR is not active during the final exam period. Students who have to miss a final exam for a medical reason have to provide documentation from a health care professional.

Dropping a Course, Withdrawals and Incompletes

Students may drop a class before the end of the first five weeks of the semester by using [Penn InTouch](#). Failure to attend a course does not automatically result in being dropped from the course. Courses that are dropped will no longer appear on a student's transcript.

UPENN provides an option for students to withdraw from courses. Students may withdraw up to the end of the 10th week of the semester with the permission of the instructor. For further details, see the College's [Withdrawal from a Course](#) page.

If a student's work in a course is incomplete (s)he may receive a grade of "I" (short incomplete) or "II" (long incomplete). For instance, a student may request an incomplete after the deadline for withdrawal has passed and the only work that is incomplete is the course final exam or final paper; the student has experienced prolonged illness or a family tragedy during the semester.

Granting an incomplete is at the discretion of the instructor. Students should work out an arrangement for clearing the incomplete with the professor as soon as possible. For further details see the College's [Incomplete Grades](#) page.

Students who receive an F in a course may retake the course for credit. Both the new grade and the original F will be tabulated into the final g.p.a. and a credit unit will be awarded if the student receives a passing grade. For further details see the College's [Policy Governing Retaking a Course](#) page.

Make-up Exams

Make-up final exams are to be taken only during the designated make-up exam week, usually at the beginning of the following semester.

Deadlines

Work should be handed in on time. Work that is not handed in on the day that it is due may, at

the professor's discretion, receive less or zero credit. Professors may request that a hard copy rather than an emailed copy be handed in.

Grading

The relative weights on the different elements course work are set by the instructor. So are the rules that permit (or do not permit) dropping the lowest problem set score. If a student is permitted to drop one exam or problem set score, but misses more than one exam (for an invalid reason), then the student may receive a zero for the missed exam.

One department-wide rule is that, if the course permits dropping the lowest problem set score, a student who has entered a course late and missed the first problem set drops that one, not a later one.

Correcting Errors in Grading

Errors in grading sometimes occur; this section lays out rules and procedures for requesting a correction. The important general rule is that such a request should clearly and succinctly state the unambiguous error you believe has occurred.

Errors in grading arising from illegible or garbled answers are not subject to correction. Students who believe their work has been graded incorrectly should petition for a correction in writing to the Professor. Students should not approach either the instructor or the TA with an oral request before making their written request. Requests should be focused on the specific error and should be made within a week of the work being returned.

The entire graded work (problem set or examination) should be resubmitted; there is no guarantee that grades will rise as, statistically, positive and negative errors in grading are equally likely. If the request arises because you think different students have been graded differently, all the affected students should submit their work as a group.

Here is a suggested way to request to correct an error grading: *"Dear Prof. X: I am a student in your economics 222 course. I believe that the grades on my midterm were added up incorrectly. As you can see from the exam I left in your mailbox, I have 25 on each of the four questions, but 73 on the exam. Sincerely, Z."*

The College's policies governing the review of a grade apply. Please see [Policies Governing Grades](#).