

# Carleton University

## Department of Economics

### ECON 6503 F

#### PhD Macroeconomic Theory I

#### 2022 Fall

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Office Hours: Wednesdays, 1:30p-2:30p

Lectures: Thursdays, 2:35p-5:25p

Course Website: [Brightspace](#)

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## Course Description

This is the first part of the two-semester sequence of the PhD Macroeconomic theory. The first half of this course covers analyses of dynamic macroeconomic systems, with applications to economic growth. The second half covers micro-foundations of modern macroeconomics, with a focus on solving dynamic optimization problems.

## Textbook

There is no required textbook for the course. Some recommended texts that you may find helpful for reference purposes are:<sup>1</sup>

1. Daron Acemoglu, *Introduction to Modern Economic Growth*, Princeton University Press.
2. Lars Ljungqvist & Thomas J. Sargent, *Recursive Macroeconomic Theory*, MIT Press.
3. Robert J. Barro & Xavier Sala-i-Martin, *Economic Growth*, MIT Press.
4. Nancy L. Stokey & Robert E. Lucas, Jr., *Recursive Methods in Economic Dynamics*, Harvard University Press.
5. David Romer, *Advanced Macroeconomics*, McGraw-Hill.

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<sup>1</sup>In cases where there are multiple editions, newer editions are usually preferable, but in most cases any edition will do.

The course will be taught mainly from my own lecture notes, which will typically be posted on the course website. These notes generally (though not always) overlap with one or more of the above textbooks, though the presentation style is in many cases quite different. As a result, the textbooks, while not necessary, may be useful for some students who feel they could benefit from a different take on the materials covered in the lecture notes. My suggestion is to hold off on buying any of these textbooks until you have a better idea of whether you might benefit from it.

If you do end up buying one of these textbooks, here are my own opinions on them (other professors may reasonably disagree).

- If you're only going to buy one, I think Ljungvist & Sargent will be the most useful in your future as a macro researcher *unless* you plan on working in economic growth. It's also a bit lacking in terms of formal theory, instead taking a bit more of an intuitive, informal approach.
- For economic growth, or to get a better handle on formal macro theory, Acemoglu is probably your best bet (despite its name, much of the theory discussed in the first half of Acemoglu's book is applicable well beyond the sub-field of economic growth).
- Barro & Sala-i-Martin is a good option if you're interested in economic growth, but want to avoid the formal theory in Acemoglu.
- Stokey & Lucas is the most comprehensive of these options when it comes to formal macro theory, but is written at a highly technical, mathematical level (much more so than even Acemoglu). I wouldn't make this your first stop for anything, but it's a great secondary reference work for the more mathematically inclined.
- Romer is a good textbook if you want a comprehensive high-level overview to a particular macro topic, with lots of citations to direct you to further reading. However, while it excels in breadth, it's lacking in detail. For example, many of the mathematical derivations are omitted, with only the final result shown, which can be frustrating at times for students.

## Course Website

This course will make use of Brightspace. I will post all materials for the course on the [Brightspace](#) course website, and also use that platform as a means of communicating important information about the course. Please ensure that you are set up on Brightspace prior to the course start date.

## Lectures

All lectures will be held in person only. No recordings will be made available.

## Course Material

As noted above, the course will be taught mainly from my own lecture notes. However, there may be cases where I discuss some things in class that aren't in the lecture notes, or vice versa. Unless I specifically indicate otherwise, you are responsible for knowing all material discussed in class *or* in the lecture notes (or both).

## Computational Software

This course will involve assignments that require the use of computational software. You have two options:

1. **MATLAB**, which requires a paid license. If you have a Carleton email account, you [should have access to a student MATLAB license for free](#) through the university.
2. **Julia**, which is [freely available software](#).

The main advantage to MATLAB is that it is a very mature piece of software (the earliest versions are from the late 1970s) that is also officially maintained and extensively supported by the company that owns it (Mathworks). As a result, in my experience it is easier to use, more reliable, and has more support and help available for it (both official and unofficial) than Julia.

On the other hand, Julia is probably more powerful and versatile than MATLAB, and for some applications also considerably faster. It's also freely available, which makes it more likely to be available to you in the future if and when you no longer have access to a Carleton MATLAB license. The main downsides are that it can be harder to work with at times than MATLAB, and since the software is relatively new and doesn't have the same resources behind it as MATLAB (after all, it's free), it ultimately does not have the same degree of support and help available for it.

You are free to do your assignments with either piece of software. The one caveat you should be aware of, though, is that I myself have limited experience with Julia, so I won't be able to be of much (if any) help to you if you're having trouble with something.

## Course Outline and Schedule

The outline below lists the tentative plan for the topics that we will cover. I reserve the right to make changes to this list as the term proceeds.

1. Economic growth
  - (i) Solow model
  - (ii) Continuous-time optimization and the Ramsey-Cass-Koopmans model
  - (iii) Endogenous growth
2. Discrete-time optimization theory
3. Consumption (permanent income hypothesis, asset pricing, risk premium puzzle)
4. Overlapping generations
5. Investment (time-permitting)

## Evaluation

Each student's grade will be calculated as follows:

- Written assignments: 48% (six assignments worth 8% of the final grade each).
- Midterm exams: 26% (two midterms worth 13% of the final grade each).
- Final exam: 26%.

## Assignments

There will be six assignments, each worth 8% of the final grade. Each assignment will consist of various questions intended to support and reinforce students' comprehension of the course material, and to provide an indication of the type of questions that will be on the exams. As such, students are encouraged to treat each assignment as a critical learning opportunity. While students are encouraged to discuss the assignment material with classmates, each student must ensure that their submitted work is their own. Please see the statement on plagiarism below.

Generally speaking, **only physical copies** of assignments will be accepted, and must be received by the due date and time indicated on the assignment. **Late assignments will not be accepted, and will receive a mark of zero.** In those rare cases where an unexpected emergency prevents you from being able to make it to campus to turn in your assignment, you should scan it (either using a proper scanner, or using your smartphone with some kind of scanning app) and submit it to me electronically via email **before** the due date and time, along with an explanation for why you were unable to deliver the assignment in person. If I consider your explanation acceptable, I will grade the electronic submission (NOTE: In such cases, I won't be able to provide explicit feedback, you'll only receive your marks). If I don't consider your explanation acceptable, you'll receive a mark of zero.

I will generally post the assignments 7-10 days in advance of the due date, and therefore **only in rare cases where a student can document a compelling reason for a prolonged absence will he or she be excused from handing in an assignment.** In such rare cases, the weight of that assignment will be transferred to the final exam.

The tentative due dates for the assignments are as follows: **Sep. 22, Oct. 6, Oct. 20, Nov. 10, Nov. 24, and Dec. 8.** I reserve the right to modify these dates depending on how the semester progresses.

While every effort will be made to return graded assignments to students in a timely manner, sometimes delays are unavoidable. It is therefore recommended that students **retain some form of copy of their completed assignment** when handing it in.

## Exams

### Midterm Exam

There will be two midterms, tentatively scheduled for **Thursday, October 13** and **Thursday, November 17** during the lecture time. However, I reserve the right to modify these dates depending on how the semester progresses.

Students who can document a compelling reason for missing a midterm exam will be excused and the weight of that midterm will be automatically added to the final exam. If possible, students *must* inform me in advance if they are unable to write a midterm for some reason. There will be no deferred/make-up midterm exams.

### Final Exam

The final exam will take place during the term examination period at a time set by the University. The final exam will cover content from the entire course.

## Re-grading

Any request for the remarking of an exam or assignment must be submitted in writing within one week of exam/assignment grades being returned to the class. The request should contain a detailed explanation of why you feel you should receive a higher mark. Please note that remarking will apply to the entire assignment/exam, not just the contentious question. As a result, the revised mark could end up being higher than, lower than, or the same as the original mark.

## Final Course Grade

Students must fulfill both the midterm and final exam course requirements in order to achieve a passing grade (B- or higher). Failure to write the final exam or either of the midterm exams without a documented compelling reason will result in a grade of F. Application to write a deferred final examination must be made at the Registrar's Office.

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

## Plagiarism

The University Academic Integrity Policy defines plagiarism as “*presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one's own.*” This includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not lim-

ited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another's data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one's own; and
- failing to acknowledge sources through the use of proper citations when using another's work and/or failing to use quotations marks.

Plagiarism is a serious offence that cannot be resolved directly by the course's instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course. For further information on how to avoid plagiarism, please see "[Academic Integrity and Offenses of Conduct.](#)"

## Treatment of Course Materials

Student, teaching, assignment or professor materials created for this course (including but not limited to lecture slides, presentations and posted notes, labs, case studies, assignments, exams and solutions to assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

## Statement on Student Mental Health

As a University student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you. Here is a list that may be helpful:

### Emergency Resources (on and off campus):

<https://carleton.ca/health/emergencies-and-crisis/emergency-numbers/>

### Carleton Resources:

- Mental Health and Wellbeing: <https://carleton.ca/wellness/>
- Health & Counselling Services: <https://carleton.ca/health/>
- Paul Menton Centre: <https://carleton.ca/pmc/>

- Academic Advising Centre (AAC): <https://carleton.ca/academicadvising/>
- Centre for Student Academic Support (CSAS): <https://carleton.ca/csas/>
- Equity & Inclusivity Communities: <https://carleton.ca/equity/>

### Off Campus Resources:

- Distress Centre of Ottawa and Region: (613) 238-3311 or TEXT: 343-306-5550, <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: (613) 722-6914, 1-866-996-0991, <http://www.crisisline.ca/>
- Empower Me: 1-844-741-6389, <https://students.carleton.ca/services/empower-me-counselling-services/>
- Good2Talk: 1-866-925-5454, <https://good2talk.ca/>
- The Walk-In Counselling Clinic: <https://walkincounselling.com>

## Statement on Pandemic Measures

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are [a number of actions you can take](#) to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

**Feeling sick?** Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you should follow Carleton's [symptom reporting protocols](#).

**Masks:** Masks are no longer mandatory in university buildings and facilities. However, we continue to recommend masking when indoors, particularly if physical distancing cannot be maintained. We are aware that personal preferences regarding optional mask use will vary greatly, and we ask that we all show consideration and care for each other during this transition.

**Vaccines:** While proof of vaccination is no longer required to access campus or participate in in-person Carleton activities, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible and submit their booster dose information in [cuScreen](#) as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the [University's COVID-19](#)

[website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact [covidinfo@carleton.ca](mailto:covidinfo@carleton.ca).

## Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

**Pregnancy obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For accommodation regarding a formally-scheduled final exam, you must complete the Pregnancy Accommodation Form ([click here](#)).

**Religious obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details [click here](#).

**Academic Accommodations for Students with Disabilities:** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

### Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/equity/sexual-assault-support-services>

### Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation will be provided to students who compete or perform at the national or international level. Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>