

# Econ 126: Computational Macroeconomics

Winter 2019

University of California, Irvine

Instructor: Brian C. Jenkins

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Office Hours: Tuesday, 1-3pm and by appointment.

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Course Website: <https://canvas.eee.uci.edu/courses/15268>

**Course Description:** Computational methods are an important tool for macroeconomic research. In fact, computational methods are often the only way to solve and simulate many modern macroeconomic models because most are too complicated to be solved analytically (i.e., with pencil and paper). This course will provide an introduction to some of the computational methods that macroeconomists use to study economic growth and the business cycle.

Students will learn how to write computer programs in Python to solve and simulate macroeconomic models of growth and the business cycle. Students will also learn how to use Python programs to download and manage data from internet resources and to do basic statistics. Ultimately, students will develop stronger macroeconomic intuition and will gain a better sense of what practicing macroeconomic researchers do while also learning basic Python programming skills.

This course presumes no prior experience with computer programming and will provide a brief introduction to programming in Python. The philosophy of this course is that programming is like cooking. Most people learn how to cook as they go; acquiring the skills necessary to execute a desired recipe. Likewise, following a brief introduction to Python basics, programming techniques will be learned on an as-needed basis.

**Resources:** There isn't a required textbook for this course. But the following resources may be helpful:

- *Python 3 for Absolute Beginners* by Tim Hall and J-P Stacey (PDF download available from UCI Libraries: <http://antpac.lib.uci.edu/record=b4370378~S7>).
- *Python Programming for Beginners* by Jason Cannon. Easy to read book with a bunch of examples.
- Thomas J. Sargent and John Stachurski's Python lectures (lectures plus other computing resources: <http://lectures.quantecon.org/py/index.html>). In particular, the content in the section: *Introduction to Python*.
- Stack Overflow (<https://stackoverflow.com>). Many of the programming questions that you have already been asked and answered (often more than once) on Stack Overflow. It's an excellent resource for finding examples of working code that you can modify for your purposes.

I will provide you with required readings, data, example programs, and other resources and these will be made available to you either through Canvas if the materials are subject to copyright protection.

**Prerequisites/Corequisites:** Econ 100C or Econ 105C (prereq) and Econ 122A or Econ 123A (coreq).

**Attendance:** I will take attendance. You are allowed up to two unexcused absences without your final grade being affected.

**Academic Integrity:** I take it seriously and you should too. The minimum academic penalty for cheating on a homework assignment or exam is a zero grade for the assignment or exam in question and the maximum academic penalty will be a failing grade for the course. Additional administrative penalties may be imposed by the university. I will not hesitate to report suspected cheaters to the Office of Academic Integrity & Student Conduct. Review the university's policies at: <https://aisc.uci.edu/index>.

**Students with Disabilities:** If you require special accommodation, then you must submit documentation from the Disability Services Center (DSC) to me within the first two weeks of the quarter *and* you must inform me in writing *at least one week in advance* of each instance for which an accommodation will be required.

**Grading:** Your course grade will be a weighted average of your performance on several activities. The respective weights are:

Participation & attendance:	5%
Discussion assignments:	10%
Homework:	25%
Group project & presentation:	30%
Written Final Exam:	30%

*Participation & attendance:* Participation and attendance are required.

*Homework:* For each homework assignment, you will be required to complete the exercises in a Jupyter Notebook template. Homework will be due on the first class of each week by the *beginning* of class on the day on which they are due. You will submit your assignments by exporting your

completed Jupyter Notebook to html and uploading the html file to the appropriate Canvas assignment page.

The following penalties will apply to late assignments:

Time past deadline	Grade deduction
Less than 1 hr, 20 mins	10%
1 hr, 20 mins and less than 24 hours	50%
24 hours or more	100%

You may work with each other on assignments, but you must turn in your own assignment to be eligible for credit. All assignments will count toward your final grade.

*Group project:* Towards the end of the course, you will be divided in groups of about five students to complete a small programming project. Each group will be tasked with solving and simulating a business cycle model that is an extension of what we cover in class. Each group will submit a single Jupyter Notebook with all of the code and results for their project. And each group will give a five to ten minute presentation on the particular model that they simulated and the major results that they found.

*Final Exam:* **Tuesday, March 19, 10:30-12:30pm.** The final exam will be handwritten and everyone must take it.

**Discussion Sections:** Weekly discussion sections will typically meet in a computer lab. Each discussion section will center around a problem set based on the week's lecture. The problem set will be completed and submitted in-class. These assignments cannot be made up.

Discussion attendance and participation is required for every discussion except during the first week. You may miss *one* discussion from week through week 9 without penalty. Week 10 discussion is mandatory.