Department of Economics, Boston College,
140 Commonwealth Ave, Chestnut Hill, Mass. 02467

Course Syllabus

ECON3393: Computational Methods in Macroeconomics

[Spring 2026]

Course Information

Course Title: Computational Methods in Macroeconomics

Instructor: Paul D. McNelis, S.J. [BC '70-MCAS]

Email: paul.mcnelis@bc.edu

Class Time: Tuesday and Thursday, 9:00-10:15am, beginning on January 13. There are no classes during Spring Vacation (March 3 and 5) and April 21 (when a Monday class schedule is followed). The last class is April 30. The final project will be due on May 10.

Office Hours: Monday and Wednesday, 3:30-5:30, Office: O'Neill 563. This office is on the South end. Enter a door number 528, turn left in the corridor at the first option and the office is at the end of the smaller corridor on the right.

Graduate Assistant: Mr. Rodolfo Lazaro [lazaroro@bc.edu]

Class Location: Campion 236.

Course Description

- Textbook: *An Introduction to Computational Macroeconomics*, by Bongers, Gomez and Torres, 2019. We refer to this book as **BGT**.
- Amazon address: Link
- This course examines familiar models in Macroeconomics in a computational setting
- They are the Keynesian IS/LM model of a closed economy, the Dornbusch model of exchange rates, and the classical growth models, old and new.
- We also explore the Romer model of growth as well as the DICE (Dynamically Integrated Climate Economy) model of William Nordhaus.

Key Questions

The focus of the course is what can we learn, and learn more sharply, from models once we calibrate them and run them on a computer?

In other words, we want to subject these familiar models to "computational experiments". In particular do the models help us to understand familiar patterns we see in macroeconomic data? Can these models help us to assess the macroeconomic effects of counterfactual policies? We are learning to do theory on the computer.

Models, of course, are used for forecasting. That is the domain of Econometrics. We will examine data, even large datasets, but we want to explain patterns and discuss/debate policy, not forecast or assess statistical significance of coefficients. We also need to remember that Macroeconomics is a "data challenged" discipline. Most macro datasets are quarterly or monthly. For the Euro Area, for example, there are only 24 years of quarterly or monthly data, since the Euro started in 2000. Would the NIH take any research seriously if medical procedures were proposed on the basis of 100 quarterly observations? Bottom line: we are a *data challenged* discipline and we need to look at the implications of different models for policy formulation

Course Objectives

- Ability to implement and extend familiar macro models in a computational setting
- From comparing models with the experience of different countries, an understanding of how political and economic structures interact.
- Ability to present the results of computational experiments with visual graphics for better understanding
- Ability to collaborate in class subgroups for developing presentations in a clear, concise way.
- Having fun doing collaborative research and group learning. Economics is a *social* science.

Coding Issues

- In class I will show examples with Excel, the simplest method, but students are free to use other codes.
- There are many ways to code. The world of computational macro has become a polyglot world. But we have chatGPT to help us along. But to keep things simple we will start with Excel. Students who wish to use other tools are free to consult with me or the graduate assistants
- However this is not a course in coding.
- As AI develops, friends like chatGPT and CoPilot will do the coding for us. So no need to get anxious about Julia, Matlab, Python or Stata.
- The key is to identify the issues we bring to computational experiments and how to interpret the results.

Class Environment

- Attendance Policy
  - Class participation is essential for making this course work well for you.
  - I understand that students may need an encore, may miss class for religious reasons as well as for illness. Classes will be recorded.

  - Except in an last-minute emergency, it is helpful to cultivate a professional habit to let one's "team leader" know if you cannot make it to meetings (or class).
  - Students should arrive prior to the start of class.
  - Occasional late arrivals are understandable, but chronic tardiness can be distracting to your fellow students.

- Class Decorum
  - Drinking coffee or soft drinks is permitted in class, but please do not use your class as a late mealtime.
  - Again, eating in class is a distraction for the other students. Or bring enough to share the food with everyone!
  - Use of electronic notebooks is recommended in the class but such notebooks or other electronic instruments should be used only for accessing classroom material.
  - Engaging in social texting or internet browsing during class is distracting to the other students in the class.

- Late Work Policy
  - Late Work Policy: Meeting deadlines is important in the real world.
  - Students are expected to complete their projects on time, except for reasonable mitigating circumstances.
  - Again, students should ask for an extension in writing, if a deadline cannot be met. This is professional etiquette

- Academic Integrity:
  - Using ChatGPT or to help with coding or finding references (if you check them out) is encouraged.
  - The writing up of results should be original work, with proper citations. Remember that chatGPI is subject to AI *hallucination*.

- University academic integrity policy: Link

- Disability Accommodations: All students are welcome to this class.

Requirements

- **Assignments:** There will be three essays, five to ten pages each, presenting the results of "computational experiments" with the models we analyze, or alternative models.

- The assignments may be co-authored with two other students in the class, thus groups of three (or less) but no more.

- The assignments should be submitted on the due dates, in October, November and the end of the class.

- The weighting for the class will be 20 percent for the first assignment, and 30 for the next two, with the final 20 for class participation.

- Class participation includes regular submission of progress reports on the three written assignments. Progress reports should include data sources and key questions being investigated.

- For the final assignment, students have the option of making use of the following website for online Macro-Model comparison: Link. The project can be comparison of one model under a monetary or fiscal change under two policy rules, or two models for one policy change and one policy rule. The macro-model-base project is supported by the Sloan Foundation and based at the Geothe Institute in Frankfurt. It is frequently used by European Central Bank (ECB) policy advisors.

- **Participation:** When the assignments are submitted, there will be opportunities to critique and learn from one another's work.
- Students are encouraged to talk with me or the Assistant to discuss their progress.

Class Outline: Tentative

- Classes 1-2: Introduction to Models - McNelis lecture and **BGT:** ch. 1
- Classes 3-6: The IS-LM model - **BGT:** ch. 2
- Classes 6-14: Dornbush model of exchange rate instability - McNelis lecture and Jupyter notebook, and **BGT:** ch. 3
- First assignment due: **February 26**. Shortprecis due on February 21.
- Classes 12-16: Consumption-Saving Decision - **BGT:** ch. 3-5
- Classes 17-20: Fiscal policy - **BGT:** ch. 6
- Classes 21-22: Tobin's Q and investment - **BGT:** ch. 7
- Second assignment due: **March 31**. Shore precis due on March 24.
- Classes 22-24: Growth, optimal growth, environment- **BGT:** ch. 8-9
- Classes 24-28: Summary of modeling strategies and insight.
- Final assignment: **May 10**. Shore precis due on Mah 3.

Assignments

Note on assignments: if you choose to do your assignment in a group of two or three, only one student should submit. But be sure to have all of your names on the assignment submission at the top. The same is true for the short precis due the week before the assignment. The grades will be kept on a spreadsheet. Please take care to come up with a proper interesting title for your assignments! Do not simply use the title "Assignment 1". Come on, you can do better than that. And never, every copy and paste your spreadsheet results. That is like showing your dirty pots and pans to a dinner guest before sitting down to a meal! Make your essays informative, interesting, and pleasing to the eyes.

While most will do their assignments on topics discussed in class, if students have special interests they want to pursue, I am happy to discuss alternatives. But I would caution you not to wander too far off from the material covered in the class. The purpose of these assignments is to help you assess the usefulness (or not) of the models for policy, which means working with the models.

Alternative Computational Codes

In addition to the spreadsheets I will use in class, I will post alternative coding methods for many of the topics on my github page: www.github.com/mcnelis-cmml. These codes will make use of both Dynare and Julia with Jupyter notebooks. Making use of any of these codes is purely optional. What at first the use of such coding may appear not for the fainthearted, we are living in the age of AI with friends like ChatGPT and Claude.Ai to help us along.