1. Course overview

This course will study introduce some of the essential tools to undertake research in computational economics.

2. Course structure

The course will be organized around two components:

   ii) Eight *asynchronous* recorded lectures of around 120 minutes each. Each lecture will be divided into nine video segments of around 15 minutes each.

   iii) Four *synchronous* online discussion sessions of 60 minutes each, where I will review the main material in the recorded lectures and open the floor to discussion.

   Summing up all these components, you should expect around 1,120 minutes of video content. In-class instruction in a regular semester amounts to 1,120 minutes (7 sessions of 160 minutes). Thus, we will cover the same amount of material than in a regular semester.

The dates and contents of each recorded lecture are:

- **Lecture 1, posted on September 1**: High-performance computing in economics. Software Engineering. OS and basic utilities.
- **Lecture 2, posted on September 8**: Scientific computing languages.
- **Lecture 3, posted on September 14**: Coding tools. Programming paradigms.
- **Lecture 4, posted on September 21**: Numerical Differentiation, Integration, Optimization.
- **Lecture 5, posted on September 28**: Value Function Iteration.
- **Lecture 6, posted on October 5**: Projection Methods.
- **Lecture 7, posted on October 12**: Perturbation Methods.
- **Lecture 8, posted on October 19**: Parallelization.

The dates for the Q&A sessions:

- **Q&A session 1, September 9, 5.30 pm EST.**
• Q&A session 2, September 23, 8.00 am EST.
• Q&A session 3, October 7, 5.30 pm EST.
• Q&A session 4, October 21, 8.00 am EST.

Notice that we will have two sessions late in the day (our “official meeting time”), which should work for students in the Americas and Europe and two sessions early in the day, which should work for students in Asian and Oceania. In any case, the Q&A sessions will be recorded and loaded into Canvas, and you can submit questions in advance by email. I will post the Zoom invitation at least 24 hours before each Q&A.

Notice that we will go for one more week than the end of the first half of the semester because it will allow us to distribute the material better (also, in normal years, I always teach one “extra session”). However, I have put material on parallelization for that last week, which is easy to sever from the core of the course. If you do not want to watch that last lecture or attend the last Q&A, you do not need to.

Finally, I will be happy to meet you on Zoom whenever it works for you.

3. Course requirements

There will three assignments:

1. A homework on numerical differentiation, integration, and optimization. Due on October 5.
2. A homework on value function iteration, projection, and perturbation. Due on November 2.
3. The computational replication of an influential paper (or parts of it). Due on December 1. You want to talk with me (email, zoom, etc.) regarding the paper you are interested in replicating. If you do not have a paper in mind, I can suggest one.

There is no textbook for the class. I will post on Canvas all the required papers and materials.

4. Common policies

Finally, note that all common set of policies for courses taught in the department of economics apply unless superseded by the rules above.