Course Syllabus

Department of Economics
ECONOMICS 457
Computational Economics
Winter, 2019-2020 (Second Term)

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Course Description
This course is an introduction to computational methods and their use in economic analysis. Hence, this is a course for mathematically inclined students. Steady advances in computer technology and numerical methods have changed the practice of economic science: computational skills are now an essential part of an economist’s toolkit. The aim of the course is to expose students to some of the major themes and challenges of computational economics. This will involve problem-solving activities that require the numerical solution of a number of economic models. We will study in detail a number of economic applications, with a focus on the quantitative rather than qualitative analysis of an economic problem of interest. Moreover, students will be engaged in critical assessments of computational economics research.

Note: Credit will be granted for only one of ECON 457, ECON 353.
Prerequisites: ECON 203 and 204; ECON 246 or STAT 261; ECON 350 or MATH 204; either MATH 208, or all of MATH 101, MATH 110 or MATH 211, MATH 200; ECON 225 or equivalent; one of CSC 105, CSC 110, CSC 111.
Recommendations: ECON 351 is recommended.

Class Information
Lecture time: Mon, Thu; 2:30pm-3:50pm.
Location: Elliott Building, Room 061.
Lab time: Wed; 2:30pm-3:20pm.
Lab location: BEC Building, Room 160.
Office Hours: Mon 4:00pm-5:30pm or by appointment.
Teaching Assistant: TBA
TA Office Hours: TBA
Texts/Materials

Textbook: There is no required textbook for the course. However, the book *Applied Computational Economics and Finance*, by M. Miranda and P. Fackler (MIT Press, 2002) is recommended. The paperback edition is reasonably priced, and it is very useful for students wanting to specialize in this field. However, its exercises and examples rely on MATLAB, a programming language that we will not use. An additional (optional) reading for students wanting to learn more is: *A Gentle Introduction to Effective Computing in Quantitative Research*, by H. Paarsch and K. Golyaev (MIT Press, 2016).

Course Content

Overview: The goal of the course is to teach the students how to solve numerically different economic and statistical models. We will consider several applications that will span both micro and macroeconomic problems, and will require to apply appropriate numerical methods. Given the nature of computational work, this course is structured around a practical, “learning-by-doing” principle. Experiential learning is a key principle of this course. During the term, students will be asked to code and test their own computer programs. Although no prior extensive programming experience is required, proficiency in Python will become essential as the students tackle the assignments. Python is a free programming language, whose popularity has seen a spectacular increase in recent years. The availability of several reliable libraries, together with its top-notch plotting capabilities, make it a powerful tool and a valuable asset. Lab tutorials and exercises will initially focus on basic programming skills in Python, which will become more sophisticated as the term progresses. I strongly encourage the Econ 457 students to become proficient in Python: both the TA and myself will organize our teaching around it, and we will provide guidance and feedback on Python codes only. Given their fast rate of obsolescence, I will actively discourage the use of declining software (e.g., Gauss). One of the intended learning outcomes is to empower the students to analyze complex economic issues, being eventually able to provide a formal quantitative evaluation of (for example) policy reforms.
Lectures Outline (Tentative Schedule)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Chapter</th>
<th>Week</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Programming Basics</td>
<td>1-2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Linear Equations</td>
<td>2</td>
<td>3</td>
<td>Assignment 1</td>
</tr>
<tr>
<td>Macro Applications</td>
<td>-</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Non-Linear Equations</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Complementarity Problems</td>
<td>3</td>
<td>6</td>
<td>Assignment 2</td>
</tr>
<tr>
<td>Macro Applications</td>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Numerical Optimization</td>
<td>4</td>
<td>8</td>
<td>Assignment 3</td>
</tr>
<tr>
<td>Micro Applications</td>
<td>-</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Numerical Differentiation</td>
<td>5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Numerical Integration</td>
<td>5</td>
<td>10</td>
<td>Assignment 4</td>
</tr>
<tr>
<td>Simulation</td>
<td>-</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Statistics Applications</td>
<td>-</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Student Presentations</td>
<td>-</td>
<td>12</td>
<td>Assignment 5; Classes end on April 3rd</td>
</tr>
</tbody>
</table>

457 Final Exam TBA – it will take place sometime between April 6th-24th 2020

Grading Scheme

Assignments (5): 50% (five assignments submitted, best four marks kept, each worth 12.5%). Final Exam (Take home): 40%. Participation: 10% (attendance taken randomly and/or surprise quizzes in class).

Assignments: They are designed to allow the students to learn the course material in depth and prepare for the final exam. They will be posted on the course website and should be submitted in the dedicated assignment drop-box in the Economics Department before their deadline. You are encouraged to discuss with other students how to answer them. However, you must submit your own work, independently written up. During the term, there will be 5 assignments. All of them must be submitted. Failure to do so will affect negatively the participation score. The assignment with the lowest score will be discarded in the computation of the final grade. The other five will count 12.5% each. Note: if caught copying other students’ answers, the assignment will receive a grade of 0, and will be counted directly in the overall grade for the course. In addition, the standard procedures pertaining Academic Integrity will also be initiated.

Assignments due dates: TBA. You should expect the deadlines for the assignments to be every other week. There may be some changes if necessary. Note: it is the student’s responsibility to submit assignments in a timely fashion. In general, there will be no flexibility on when the assignments are due.

Student Presentations: The last week of classes might be reserved for student presentations.
**Midterm:** There is no midterm exam for this course.

**Final exam:** It will be a take-home exam. Namely, from the moment it will be circulated, the students will have a couple of days to answer it. It will cover the material presented in the whole course. You will be asked to work by yourselves on each question. UVic's rules about cheating and plagiarism apply also to take-home exams. The print-outs of the codes used to generate the results will have to be submitted, and each student might be asked to briefly explain them. Unless agreed otherwise, the final exam scheduled by the University will be the day when the answers have to be submitted and shortly explained.

This course uses the standard Department of Economics numerical score/letter grade equivalency, which can be found at the following URL:

https://web.uvic.ca/calendar2019-09/undergrad/info/regulations/grading.html

**Course Website**

- Coursespaces is not used for this course.
- The lecture notes, and related material, will be posted on the course website:

https://sites.google.com/site/marcozzi73/home/teaching/econ-457-computational-economics

**Course Experience Survey (CES)**

I value your feedback on this course. Towards the end of term you will have the opportunity to complete a confidential course experience survey (CES) regarding your learning experience. The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey, you will receive an email inviting you to do so. If you do not receive an email invitation, you can go directly to http://ces.uvic.ca. You will need to use your UVic NetLink ID to access the survey, which can be done on your laptop, tablet or mobile device. I will remind you nearer the time, but please be thinking about this important activity, especially the following three questions, during the course.

1. What strengths did your instructor demonstrate that helped you learn in this course?
2. Please provide specific suggestions as to how the instructor could have helped you learn more effectively.
3. Please provide specific suggestions as to how this course could be improved.
Policies

This course operates within the Undergraduate Course Policies of the Department of Economics that deal with the following issues

- Academic concessions
- Academic integrity (plagiarism and cheating)
- Attendance
- Grading
- Inclusivity and diversity
- Late adds
- Late assignments
- Repeating courses
- Review of an assigned grade
- Sexualized violence
- Students with a disability
- Term assignments and debarment from examinations
- Travel plans
- Waitlists

The complete document can be obtained from the departmental website:
http://www.uvic.ca/socialsciences/economics/undergraduate/home/course%20policies/index.php

The following is some elaboration of these policies.

Waitlist Policies

- Enrollment limits are determined by classroom capacity, which is set by fire regulations. Instructors therefore have no discretion to raise the cap or admit waitlisted students. While waiting for enrolled students to drop, waitlisted students must attend all classes and submit assignments according to the normal deadline.
- Enrolled students who do not show up in the first seven calendar days from the start of the course may be dropped from the course. Enrolled students who decide not to take the course are responsible for initiating their dropping out of the course, and are urged to do so as promptly as possible out of courtesy toward waitlisted students.

Classroom Etiquette

Behave politely and professionally. Do not create negative externalities. Do not disturb or distract your fellow students or the instructor.

Academic Integrity

Please browse http://library.uvic.ca/instruction/cite/plagiarism.html#whatis for the definition of plagiarism. No form of plagiarism will be tolerated in this course.

Language

English is the instruction language at the University. Your enrollment implies that you are able to function with it. All communications between you and the classmates (in class), the instructor and the teaching assistant should be in English. You should make sure that all written work is complete and understandable.
Examination

- With certain medical condition, you should contact the instructor prior to an exam and arrangements can be made through the Resource Center for Students with a Disability.
- Students are advised not to make travel plans until after the examination timetable is finalized. Students who wish to book their trips early should book flights that depart after the end of the examination period. There will be no special accommodation if travel plans conflict with the examination.

E-mail

- You may contact me at my UVic email address. Please include both your legal name (the name in the university records) and course title in the subject of your email. Without such information, it is sometimes hard for the instructor to understand the nature of your queries. Please avoid inappropriate nicknames, email id’s and signatures. Text message lingo should not be used.
- You should contact me by email primarily on matters that relate to your personal participation, e.g. you have a medical condition that prevents you from taking an exam. It is best to raise questions related to course materials in class or in person during office hours. You may ask simple short questions via email. However, I may reply telling you that I will cover that in class or it is best to explain the question in person. E-mail is a terribly inefficient way of communicating regarding these issues. General administrative matters, such as the arrangement and the format for the assignments or exams, will ONLY be discussed in class and no answers will be provided via email.

Documentation of Academic Concessions for Medical Reasons

- When there is a medical condition, you should inform me as early as possible and bring a formal doctor’s note when your health permits.
- Under normal circumstances (e.g., influenza-like diseases), you must obtain the appropriate medical form from the University Health Services.
- Under exceptional circumstances (e.g., a severe illness that has to be treated outside Victoria), if you see a doctor off-campus, please ask the doctor to complete the appropriate medical form, sign it and attach their letterhead with contact information. Incomplete documentation will not be accepted.
- In the case of a missed final exam, the university procedure is for the student to submit a Request for Academic Concession form to Undergraduate Records and they will schedule the deferred exam.