



ECON 549 A01 (CRN 11162)

Computational Economics

Winter Session: 2026 09 – CRN 11162, Unit Value 1.5, Contact hours: classes 3.0, labs 1.0. Course schedule: Monday, Thursday. 3:30pm–4:50pm, BEC Building, Room 363. Labs: Tuesday, 3:30pm–4:20pm, Clearihue Building, Room A108. Updated August 25th 2026.

UVic Land Acknowledgement

We acknowledge and respect the Ləkʷəŋən (Songhees and Esquimalt) Peoples on whose territory the university stands, and the Ləkʷəŋən and W̱SÁNEĆ Peoples whose historical relationships with the land continue to this day.

Instructor Name: Marco Cozzi

Office: BEC 368

Method of contact: E-Mail, mcozzi _@_ uvic.ca (For legitimate questions and concerns, I'll get back within two business days).

Office Hours (in person): Monday: 5:00pm–5:45pm, Thursday: 9:00am–9:45am

TA Name: TBA

Office: TBA

Email: TBA

Office Hours: TBA

Teaching and assessment modality statement

This course is face to face and some key assessments are held in person. If needed, for example if I will get sick or for pedagogical reasons, a small number of lectures might be taught online (TBC).

Course Content

Calendar Description: An introduction to numerical methods and their application in economics.

The course is an introduction to numerical methods and their application in economic analysis. 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, such as the AD-AS model, Cournot games, and non-linear econometric 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 may be engaged in critical assessments of computational economics research. In the course, students will learn Python. No prior extensive programming experience is assumed or required.

Learning Outcomes

Students will be able to:

- *Master a set of key computational methods (e.g., optimization and simulation)*
- *Write sophisticated Python codes, working with a number of popular Python libraries/modules*
- *Use applied mathematical tools to numerically solve microeconomic, macroeconomic and statistical models*
- *Analyze complex economic issues, using realistic models*
- *Manipulate data to identify interesting patterns and empirical facts, and perform estimation*
- *Perform formal quantitative evaluations of policy reforms*
- *Apply critical thinking to interpret quantitative economic outcomes*
- *Understand the pros and cons of the economics literature based on numerical analysis*

Course prerequisites/corequisites

Suggested prerequisite: ECON 545 (or equivalent advanced undergraduate course).

Textbook/Software

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. The exercises and examples included in that book rely on MATLAB, a programming language that we will not use. Currently, an electronic version is not available.

A former PhD student and I translated into Python all the codes that will be needed. Moreover, we included all the essential material in several Python notebooks, which will be distributed during the term. For a more comprehensive treatment, please refer to the book.

Software: Python is the required programming language for the course. In order to successfully complete this course, you must be able to run a version of Python 3.5 (or higher) on a computer you have easy (and frequent) access to. There are two ways to do so. Using Anaconda is highly recommended, while the other option might work as a temporary fix.

1) Install Python and Jupyter (Lab or Notebook) with Anaconda, a free software (for students) that automatically links a number of packages and libraries we will heavily rely on:

<https://www.anaconda.com/download>

Ideally, you should do this before the course will start. Given the typical class size, and the different operating systems the students use, I will not be in a position to provide help with the software installation (for example, I am not a Mac user). Please, do get in touch with the computer help desk instead (helpdesk@uvic.ca):

<https://www.uvic.ca/systems/services/contact/>

MS Windows users should be aware that, after the installation is complete, they might have to run Jupyter as an administrator. The many Linux installations I tried worked fine.

2) The other (temporary) solution is to use the free web interface of Python and Jupyter maintained by Google (only a Google account is needed, but the drawback is that some important features cannot be enabled):

<https://cybera.syzygy.ca/>

Brightspace

Brightspace is used extensively for the course. All students are expected to be fully functional with the system. The lecture notes will be posted in *Brightspace*. Please note that the lecture notes online are only outlines of the actual lectures.

All announcements will be posted in *Brightspace*. Students are advised to check it frequently.

Course Structure, Assessments, and Grading

Use of AI

In this course, you are authorized to make use of generative AI (GenAI) such as ChatGPT. You can work with GenAI in all the assessed course components, i.e. both in the assignments and in the final project or take-home exam.

In order to not violate academic integrity, in your answers you must declare that you used ChatGPT (or other GenAI), and how you used it.

Minimum Grade Requirements

Faculty of Graduate Studies policies apply.

Grading

Grading Scheme

The grade for the course is determined as follows:

Assignments (4): 60% (four assignments submitted, and graded, each worth 15%).

Lab Tests (4): 30% (four in-class tests submitted and graded; only the best three test grades will count towards your final grade, each worth 10%).

Participation: 10% (attendance taken randomly and engagement in class).

Assignments: They are designed for the students to learn the course material in depth. They will be posted on Brightspace and submitted in the dedicated drop-boxes before their deadline. Students are encouraged to discuss with other classmates how to answer them. However, every student must submit their own work, independently written up, and list all the people they worked with in the first page. During the term, there will be 4 assignments. All of them must be submitted (with a serious attempt at solving each question, otherwise at least 10 points will be deducted from the overall grade). Answers must be submitted in specific file formats, and further details will be provided during the term. Each assignment will count 15% towards the final grade.

The quality of both the codes and the economic interpretation of the numerical results will form the basis for the assignment grades. The Economics Department policy related to grading states:

"An A+, A, or A- is earned by work which is technically superior, shows mastery of the subject matter, and in the case of an A+ offers original insight and/or goes beyond course expectations. Normally achieved by a minority of students."

Answers that simply copy what AI generated do not show mastery of the subject, or original insight. In the assignments, this type of submissions cannot get A grades.

Lab Tests: During the term, four labs will be devoted to in-class tests. Make-up tests will not be offered. The best three test scores will count 10% each towards the final grade. If you miss one test due to illness, the other three test scores will count 10% each. If you miss two in-class tests due to illness, the other two test scores will count 12.5% each (namely, your highest possible grade for the lab tests component will be 25%). If you miss more than two in-class tests, you will receive an N grade for the course. I strongly encourage students who miss more than two in-class tests due to illness to apply for a Withdrawal Under Extenuating Circumstances. For the most part, the questions in the lab tests will cover the material assessed in the assignments. Test answers must be submitted in specific formats, and further details will be provided during the term. During the tests, the only materials you can use are the lecture slides. Note: if caught copying other students' answers, using GenAI or online materials, you will receive a grade of 0. In addition, the standard procedures pertaining Academic Integrity will be initiated.

The quality of both the codes and the economic interpretation of the numerical results will form the basis for the in-class tests grades.

Attendance: I will randomly select approximately 10 lectures where I will take attendance. If you cannot attend a lecture because of a valid reason, e.g. you are sick, please notify me by email before the start of the lecture. Excused absences will not affect your attendance score.

Midterm/Final: There is no midterm or final exam for this course.

Grade concerns should be brought to the instructor as soon as possible. The grades of each assessment component are final after one week of being distributed.

Mandatory/Essential Course Components

Submitting all assignments is mandatory. Failure to do so will result in a grade of N, regardless of the cumulative percentage on the course. Students who have completed at least two of the four lab tests will be considered to have completed the course. Failure to complete at least two lab tests will result in a grade of N. N is a failing grade and factors into GPA as a value of 0.

Dates of Assessments, Due Dates of Assignments

Note: it is the student's responsibility to submit assignments in a timely fashion. Unless a student has a CAL accommodation, or an approved in-course extension, there will be no flexibility on when the assignments are due (or on how to submit them).

Assignments (tentative) Due Dates: The tentative deadlines are September 29th, October 20th, November 12th, and November 26th. There may be some changes if necessary.

Lab Tests (tentative) Dates: The tentative test dates are October 6th, October 27th, November 17th, and December 1st. There may be some changes if necessary.

Grading Scale

A+	90-100%
A	85-89%
A-	80-84%
B+	77-79%
B	73-76%
B-	70-72%
C+	65-69%
C	60-64%
D	50-59%
F or N	0-49%

Missing Assessments

Students requesting an academic concession are required to indicate the specific grounds for the request and to provide justification outlining the impact of the circumstances on their ability to complete course requirements. Please see [Academic Calendar](#) for more information on academic concessions.

Academic Integrity

Academic integrity is fundamental to all scholarly work. At the University of Victoria (UVic), students are expected to comply with the university's academic regulations and must not engage in acts of dishonesty, falsification, misrepresentation, or deception in any academic work. Violations of [the University's academic integrity policy](#) may result in academic or disciplinary consequences. The University reserves the right to use a plagiarism software to detect violations of academic integrity.

University Policies and Statements

Please note that this course is executed in a manner consistent with these University statements and policies.

Resources for students

- a. [Student wellness](#)
- b. [Centre for Accessible Learning](#)
- c. [UVic Learn](#). UVic Learn is the primary learning resource for students that offers many learning workshops and resources to help students with academics and learning strategies.
- d. [Library](#) resources
- e. Academic Skills Centre ([ASC](#))
- f. Learning Assistance Program ([LAP](#))
- g. [Academic Advising](#)
- h. Economics Undergraduate Advising: ecadvice@uvic.ca
- i. [Student Awards and Financial Aid](#)
- j. [International Student Advising](#)
- k. Indigenous student services ([ISS](#))
- l. [Student groups and resources](#) including UVic [Ombudsperson](#)

Indigenous student services ([ISS](#))

Student Experience of Learning (SEL) Survey

I value your feedback on this course. Towards the end of term, you will have the opportunity to complete a confidential SEL survey 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.

Course Structure

Topic	Chapter	Week	Due Dates and Exam Information
Introduction	1	1	
Programming Basics	1-2	1-2	
Linear Equations	2	3	
Macro Applications		4	Assignment 1
Non-Linear Equations	3	5	
Macro Applications		6 & 7	
Micro Applications		7 & 8	Assignment 2
Numerical Optimization	4	8	
Finance Applications		8	
Numerical Differentiation	5	9	Assignment 3
Numerical Integration	5	9 & 10	
Simulation		11	
Dynamic Applications	7-8	12	
Statistics Applications		12	Assignment 4
			Classes end on Dec 7th

Course Content: the main goal of the course is to teach the students a number of computational tools. These will be used to numerically solve economic and statistical models. We will consider several applications, spanning microeconomics, macroeconomics and econometrics. Given the nature of computational work, this course is structured around a practical “learning-by-doing” principle. During the term, students will 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 Python programming skills, which will become more sophisticated as the term progresses. I strongly encourage the Econ 549 students to become proficient in Python. I will organize the teaching around it, and I will provide guidance and feedback on Python codes only.

E-mail Correspondence

Emails should be limited to critical matters, such as inability to attend class, an exam, or prolonged illness, and should include the course name and number in the subject line. Questions on course material should be asked during office hours or in class. The standard format for writing a letter must be used. This means it should begin with a salutation (e.g. Dear....), include full sentences and it must conclude with a signature that includes your **full name and V#**. Text message lingo should not be used. Note that it is not uncommon for Uvic's spam filters to block emails sent from non-uvic email accounts.

Electronic Devices

Countless studies unequivocally show that using electronic devices in class is detrimental to student learning. Please refrain from using your phone in class. Taking notes with paper and pencil might prove a useful commitment device to minimize the temptations of social media.

Educational Technology involving storage outside Canada

The following educational technologies, which stores or accesses your personal information outside Canada, is required for this course: Zoom. I will make you aware if this list changes.

Personal information is required by the service. The privacy policy and the terms of use list the personal information stored outside of Canada and are available at <https://explore.zoom.us/en/privacy/>. I encourage you to read these documents.

If you are not comfortable with your personal information being stored outside of Canada, please speak to me within the first week of class about using an alternative (such as using an alias or nickname). Otherwise, by continuing in this course, you agree to the use of the educational technology in the course and the storage of personal information outside of Canada.