



ECON 350 A01

Mathematical Economics I: An Introduction to Static Methods

Winter Session: 2024 09 – CRN 11123, 1.5 Units, Contact hours 3-1-0, TWF 9:30-10:20 AM COR B108

UVic Land Acknowledgement

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

Instructor Name: David Scoones

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Office Hours: Wednesday 11-noon on zoom (starting September 11); or by appointment.
<https://uvic.zoom.us/j/89380816135?pwd=FMnJYJZ5jsmtU1c6Jx8jJxy8GRd3k.1>

TA Name: TBA

Office:

Email:

Office Hours:

Course Content

This course will familiarize you with the mathematical tools most frequently used by economists. Expect there to be considerable overlap with material in your prior courses, as part of the purpose here is to give you more practice using these tools. Topics include single and multiple variable calculus, unconstrained and constrained optimization, matrix algebra and some basic real analysis. Examples from economics will be used frequently, but the emphasis is mostly on the tools of analysis rather than the results.

Learning Outcomes

When you have successfully completed this course, you

- will have reviewed basic properties of sets and functions underlying economic modelling
- be able to explain the meaning of logical terms used in the construction and examination of economic models
- will have practice applying algebra and calculus in the construction of economic models
- will be able to define and identify functional form restrictions satisfying properties of continuity, concavity, convexity
- define the meaning of equilibrium in a static economic model
- understand the relationship between the number of endogenous and exogenous variables and equations and the existence and form of a model's equilibrium
- be able to define and test for parameter and functional form restrictions that ensuring the existence of local and global equilibria
- be able to conduct and interpret comparative static analysis of an economic model
- will have reviewed various basic and familiar economic models when presented mathematically

Course prerequisites/corequisites

Prerequisites:

Complete 1 of the following

- Earn a minimum grade of B in the following:
 - [MATH208](#) - Mathematics for Economics and Econometrics (1.5)
- Complete all of the following
 - Complete all of:
 - [MATH101](#) - Calculus II (1.5)
 - Complete 1 of:
 - [MATH110](#) - Matrix Algebra for Engineers (1.5)
 - [MATH211](#) - Matrix Algebra I (1.5)
 - Complete all of:
 - [MATH200](#) - Calculus III (1.5)

Pre- or co-requisites

- Completed or concurrently enrolled in all of:
 - [ECON203](#) - Intermediate Microeconomics I (1.5)

Repeating Courses

Be aware of the policy regarding the repeating of courses; see [University Calendar](#).

In order to request permission to attempt this course for the third time, you must follow the instructions provided under the [Repeating Courses](#) policy on the Economics website.

Failure to obtain permission will result in deregistration from the course.

Textbook: *Mathematics for Economics* 4th ed. by Michael Hoy, John Livernois, Chris McKenna, Ray Rees, and Thanasis Stengos (MIT Press: Cambridge 2022)

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.

Minimum Grade Requirements

The BSc. Major degree in Economics requires a minimum grade of C in ECON350; the BSc. Honours degree requires a minimum grade of B.

Grading

Grading Scheme

The course grade is determined as follows:

| | |
|--------------------------------|-----|
| Lab participation: | 5% |
| Best 5 of 6 bi-weekly quizzes. | 45% |
| Final Exam | 50% |

There will be a quiz every second Friday (starting in week 3, September 20). The quiz questions will largely be similar or identical to those assigned from the textbook as daily homework over the preceding two weeks and examples presented in class. Be prepared to write your answers by hand without the aid of study materials or notes. The homework itself will carry no direct weight in the final grade, but is the most valuable study guide for the quizzes. I encourage you to collaborate with classmates and see other sources of study material.

Teaching Assistants will provide additional discussion and support in the weekly labs. Several times in the term depending on available time there will be a short written exercise in Lab. These grades will constitute the lab participation grade. The Final Exam covers the entire course.

Required Course Components

Students who have completed the following elements will be considered to have completed the course:

- Three of six quizzes
- The final exam

Failure to complete one or more of these elements will result in a grade of “N” regardless of the cumulative percentage on other elements of the course. **N is a failing grade** and factors into GPA with the value 0.

Grading Scale

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

Students should review the University's more detailed [summary of grading](#).

Missing Assessments

Should students encounter a situation where they miss an exam or cannot submit an assignment at its due date, they may qualify for an academic concession. Students are required to indicate the specific grounds on which they are requesting an academic concession and to provide a justification outlining the impact of the circumstances on their ability to complete course requirements. For in-course extensions, please [fill in the form and follow the instructions on the form](#). I will not respond to informal requests of academic concessions. Note that the term quizzes are graded best 5 of 6 so the first missed quiz will not qualify for a concession. Further in-course concessions will typically be made up by reassigning weight to other elements in the class. In case you miss the final exam, fill in a [request for a deferral](#).

Students are advised not to make work or travel plans until after the examination timetable has been finalized. Students who wish to finalize their travel plans at an earlier date should book flights that depart after the end of the examination period. Students do not qualify for an academic concession if travel plans conflict with the examination.

E-mail Correspondence

Questions on course material should be asked during office hours or in class or posted to the class discussion forum on Brightspace. Emails should be limited to critical matters, such as inability to attend class, an exam, or prolonged illness. Include the course name and number in the subject line, and use standard format for writing a letter. Begin with a salutation, include full sentences and it must conclude with a signature that includes your **full name and V#**. Text message abbreviations should not be used.

Electronic Devices

Recording lectures or uploading course material for sharing with anyone not registered in your section of the course **without express permission** is a violation of Academic Integrity.

Use of AI

Many of the topics covered in this course can be solved using mathematical software or generative AI. The goal of the course is for you to practice using the tools of mathematics to the point where using software including AI can be done with confidence and understanding. In some circumstances technological support can help in the process of learning, but using it too soon takes practice questions and turns them into worked examples, and the textbook and notes already contain many of these. No software support of any kind will be allowed on graded work in the class.

Your Course Experience

This course is intended to be interesting in its own right, but mainly to deepen your understanding of the core mathematical tools underlying the theoretical and empirical claims that are made in other classes. Much of the material may be more or less familiar from other classes. This makes it **especially useful to have account for your experience in the course**. There are several ways you can do that.

Speak up in class if we are moving too fast or too slow. Remind me of the material you are familiar with, and indicate subjects that are entirely new. Most students will have a similar experience.

This can also be done in private. One way is by using the Confidential Feedback Form linked to the Brightspace page. This is truly anonymous.

Finally, 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 the [CES log-in](#). You will use your UVic NetLink ID to access the survey, which can be completed 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.

What strengths did your **instructor** demonstrate that helped you learn in this course?

Please provide specific suggestions as to how the **instructor** could have helped you learn more effectively.

Please provide specific suggestions as to how this **course** could be improved.

Economics Course Policies

This course adheres to 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 prevention and response
- Students with a disability
- Term assignments and debarment from examinations

- Travel plans
- Waitlists

The following policies are explicitly included because of their importance:

Waitlist Policies

- Instructors have no discretion to admit waitlisted students or raise the cap on the course.
- Students on the waitlist should discuss with the instructor how to ensure they are not behind with coursework in the event they are admitted.
- Registered students who do not participate as specified in this outline during the first 7 calendar days from the start of the course may be dropped from the course.
- Registered students who decide not to take the course are responsible for dropping the course and are urged to do so promptly out of courtesy toward waitlisted students.
- Waitlist offers cease after the last date for adding courses irrespective of published waitlists.

Academic Integrity

Academic integrity requires commitment to the values of honesty, trust, fairness, respect, and responsibility. Students are expected to observe the same standards of scholarly integrity as their academic and professional counterparts. A student who is found to have engaged in unethical academic behaviour, including the practices described in the [Policy on Academic Integrity](#) in the University Calendar, is subject to penalty by the University.

Review [What is Plagiarism](#) for the definition of plagiarism. Note: Submitted work may be checked using plagiarism detection software.

Student Code of Conduct

The Humanities, Science, and Social Sciences Faculties have adopted this [Student code of conduct](#). Please, review.

University Policies

- University Calendar - Section "[Information for all students](#)"
- [Creating a respectful, inclusive and productive learning environment](#)
- [Accommodation of Religious Observance](#)
- [Student Conduct](#)
- [Non-academic Student Misconduct](#)
- [Accessibility](#)
- [Diversity / EDI](#)
- [Equity statement](#)
- Discrimination and Harassment [Policy](#)
- [Policy on Human Rights, Equity and Fairness](#) - The University is committed to promoting, providing and protecting a positive, supportive and safe learning and working environment for all its members.

Sexualized Violence Prevention & Response

UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. Students are encouraged to learn more about how the university defines sexualized violence and its overall approach by visiting www.uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Contact svpcoordinator@uvic.ca.

Resources for Students

[UVic Learn Anywhere](#) - UVic Learn Anywhere is the primary learning resource for students that offers many learning workshops and resources to help students with academics and learning strategies.

[Centre for Accessible Learning](#) - Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, you are free to approach me; however, you must register with the [Centre for Accessible Learning](#) (CAL) for formal arrangements to be made. The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

[Centre for Academic Communication](#) - Offers coaching on [academic integrity](#), including preventing accidental plagiarism. Provides support to students with time management, reading, writing, speaking, understanding academic expectations, and other aspects of academic communication as well as creating academic posters, blogposts, PowerPoint slides, and e-portfolios.

[Health Services](#) - University Health Services (UHS) provides a full service primary health clinic for students, and coordinates healthy student and campus initiatives.

[Support Connect](#) - a 24/7 mental health support service for students

- Toll-free (calls from North America): 1-844-773-1427
- International collect calls: 1-250-999-7621

[Counselling Services](#) - Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students.

[Indigenous Student Services](#) - Indigenous UVic students have access to many sources of support on campus. Before, during and after your time at UVic, you are encouraged to explore programs and services available to you, such as [Indigenous counselling services](#) and the [Elders in Residence](#), as well as non-academic programs that may be of interest to you.

[International Student Support](#) - The University of Victoria offers a number of resources to support international students as they pursue their studies. UVic's [International Centre for Students](#) is the primary office supporting international students on campus at the university-wide level and provides various supportive program through the [UVic Global Community Initiative](#), including a Mentorship Program and Conversation Partner Program.

For academic advising-related questions, students in the Economics Department are also encouraged to meet with the Economics Undergraduate Advisor (Brooklynn Comish-Trimble, ecadvice@uvic.ca) as well as an academic advisor in the [Academic Advising Centre](#) early in their studies to help map out a plan to

declare a major and complete university program requirements. Other resources include the [Centre for Academic Communication](#) and the [Math and Stats Assistance Centre](#).

The International Student Liaison in the Economics Department is Dr. Paul Schure who can help you connect with other international and domestic students in the Department. His email address is schure@uvic.ca. Please, reach out if you are interested.

Course Structure

Tentative Course Outline

| Topic | Chapter | Week | Due Dates and Exam Information |
|--|---------|------|--------------------------------|
| 1. Introduction. Models & logic. Sets & functions | 1,2 | 1 | First Week Survey |
| 2. Sequences and Limits | 3 | 2 | None |
| 3. Univariate Calculus: Continuity, Derivatives | 4,5 | 3 | Quiz 1 |
| 4. Univariate Calculus: Optimization | 6 | 4 | None |
| 5. Linear Algebra: Systems of Equations, Matrices | 7,8 | 5 | Quiz 2 |
| 6. Linear Algebra: Determinants and Inverses | 9 | 6 | None |
| 7. Linear Algebra: Advanced topics | 10 | 7 | Quiz 3 |
| 8. Multivariate Calculus: Functions of n-Variables; | 11 | 8 | None |
| 9. Multivariate Calculus: Unconstrained Optimization | 12 | 9 | Quiz 4 |
| 9. Multivariate Calculus: Constrained Optimization | 13 | 10 | None |
| 10. Multivariate Calculus: Comparative Statics | 14 | 11 | Quiz 5 |
| 11. Multivariate Calculus: Concave Programming | 15 | 12 | None |
| 12. Review | 1 to 15 | 13 | Quiz 6 |