

**ECON 351 - University of Victoria**  
**Mathematical Economics II: An Introduction to Dynamic Methods**  
**Spring 2023 – A01 (CRN: 21089); A02 (CRN: 21090)**

**Instructor:** Dr. Daniel Rondeau, BEC 342; rondeau@uvic.ca  
**Office Hours:** Wednesdays 11:00-12:00 and 2:00 – 3:00 or by appointment  
**Classes:** Mon + Thur. A01: 11:30 – 12:50 Elliott 061; A02: 2:30-3:50 Elliott 060  
**Prerequisites:** Successful completion of Econ 350. The pre-requisite will not be waived.  
**Course Web Page:** Brightspace

**Course Overview:**

The objective of the course is to prepare students for the study of advanced economics topics in which *time* is an important dimension (e.g. macroeconomic theory, natural resource economics, time series econometrics, learning, evolutionary game theory, etc.). The course is concerned with the fundamental mathematical methods of economic dynamics: Integration, Difference Equations, Differential Equations, Complex Numbers, Systems of differential equations, and optimal control theory (if time permits).

By the end of the course, students should be able to solve or qualitatively analyze the behavior of variables that evolve according to linear and non-linear first and second order difference and ordinary differential equations; and analyze systems of difference or differential equations. In addition, students should have a basic understanding of how to optimally choose a variable over time using optimal control theory or dynamic programming (if time permits).

**Textbook**

The required text for this course is  
Hoy, Livernois, McKenna, Rees and Stengos. Mathematics for Economics, 3rd Edition, MIT Press, 2011.

**Lecture Topics**

The course will cover chapters 16 to 25 of the Hoy et al. text. The chapters will be covered in the following order: 17 to 20, 16, 21 to 25. The Table of Contents of the textbook constitutes a detailed outline of the topics covered in the course, although some sections of selected chapters will not be covered. The topics are:

1. Introduction to Economic Dynamics (Ch. 17)
2. Linear First Order difference equations (Ch. 18)
3. Non-linear First Order difference equations (Ch. 19)
4. Key results from Complex Number Theory and trigonometry (Hoy et al. online technical Appendix)
5. Linear Second Order difference equations (Ch. 20)
6. Key elements of Integration (Ch. 16)
7. Linear First Order differential equations (Ch. 21)
8. Non-linear First Order differential equations (Ch. 22)
9. Linear Second Order differential equations (Ch. 23)
10. Systems of difference and differential equations (Ch. 24)
11. Optimal Control Theory (Ch. 25) – if time allows.

**Grading:**

Two mid-term examinations and a final exam.

Mid-term examinations: **NOTE THE NON-STANDARD TIMES AND LOCATIONS:**

Thursday **February 16: 7pm-9pm LOCATION: DTB A120**

Thursday **March 23: 7pm-9pm LOCATION: DTB A120**

Final grades will be calculated according to the following weights:

Best of two midterms	30%
Worst of two midterms	20%
Final Examination (cumulative):	50%

**Students who have questions or concerns regarding their grade should come to office hours. All concerns must be brought to my attention no later than one week after the graded material was returned. After one week, any assigned grade is final.**

**Failed exams cannot be retaken and no extra work can be done to improve your grade.**

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](#).

**Course Policies**

This course adheres to the [Undergraduate Course Policies](#) of the Department of Economics. The following policies are explicitly included because of their importance.

**Examinations**

Participation online for all scheduled examinations is mandatory. Consideration for missed examinations will be given only on the basis of documented illness, accident or family affliction, and for no other reasons. In the event of a missed final examination, students are advised to follow the procedures outlined in the [University Calendar](#).

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. There will be no special accommodation if travel plans conflict with the examination.

**Waitlist Policies**

- Instructors have no discretion to admit waitlisted students or raise the cap on 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 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.

See [General University Policies](#)

## **Accessibility & Health Resources**

### **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.

[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.

[Elders' Voices](#) - The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being.

## **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 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 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.

### **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.

### **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.

### **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](http://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](mailto:svpcoordinator@uvic.ca).

### **UVic Land Acknowledgement**

*We acknowledge with respect the Lekwungen peoples on whose traditional territory the University of Victoria stands, and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.*