University of Victoria | Economics

ECON 366 Econometrics: Part II (CRN: 21043)

Spring Term, Jan-Apr 2026

Instructor Name: Dr. Tao Wang
Office: BEC 392
Class Times: David Strong Building C118, Mondays and Thursdays 11:30 AM-12:50 PM
Lab Times: Clearihue Building A030 and A031, Wednesdays 3:30 PM-4:20 PM and 4:30 PM-5:20 PM
E-Mail: taow@uvic.ca
Office Hours: Mondays and Thursdays 10:00 AM-11:00 AM and via email appointment
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Note: *Students are highly encouraged to take full advantage of office hours. This time provides a valuable opportunity not only to ask questions and clarify any doubts related to the lecture material but also to delve deeper into topics of interest, discuss assignments, and receive personalized feedback.*

Territory Acknowledgement

We acknowledge and respect the lək̓ʷəŋən (Songhees and Xʷsepsəm/Esquimalt) Peoples on whose territory the University stands, and the Lək̓ʷəŋən and W̱SÁNEĆ Peoples whose historical relationships with the land continue to this day.

Course Content

This is the second course in the ECON 365/366 sequence. We will use many of the methodologies discussed in ECON 365 to advance one's knowledge of fundamental concepts within econometrics. Econometrics is the basis of all empirical economic analysis, which allows us to bridge theory about economic behavior both at the macro and the micro levels and measurement. The aim of both ECON 365 and ECON 366 is to provide you with a solid background for undertaking basic empirical research, as well as preparing you for more advanced courses at the undergraduate and graduate levels. ECON 366 covers the basic tools of estimation and inference in the context of multiple regression. The objective is to formulate the theoretical underpinnings of various models, to study the workings of many econometric models, to be able to recognize variants of existing models, and to understand the connections of machine learning methodologies with econometrics tools. The course will feature a substantial technical/statistical component (all statements will be demonstrated by the proof), as well as a programming part. The core material covers *GLS estimation, ridge regression, instrumental variables estimation, measurement error models, seemingly unrelated regression equations models, simultaneous equations models, probit and logit models, panel data models, quantile regression, time series models, and machine learning methods*.

Note: *The ECON 365/366 sequence distinguishes itself from a general applied econometrics course by providing a more rigorous and in-depth exploration of econometric theory and methods. While a general applied course primarily focuses on the practical application of econometric techniques for data analysis and interpretation, ECON 365/366 integrates a strong emphasis on the mathematical foundations, including formal proofs, advanced topics like maximum likelihood estimation and time series econometrics, and substantial programming components. This sequence is designed to equip students with both the theoretical knowledge and practical skills necessary for advanced research or further academic study in econometrics, offering a more comprehensive and challenging experience compared to the more practice-oriented applied courses.*

Learning Outcomes

The purpose of this course is to give you a foundation in econometrics techniques. Upon successful completion of this course, you will be able to:

(i) Understand the nature and scope of econometrics as a social science;
(ii) Master the foundations of different econometrics models;
(iii) Recognize how different econometrics techniques are used to estimate relevant economic parameters and test the economic hypothesis;
(iv) Be able to conduct preliminary research papers on your own.

Prerequisites

Willingness to work hard on unfamiliar materials. Understanding of basic econometric methods, linear algebra, multivariate calculus, and elementary probability theory. Students typically benefit more from the class if they have taken ECON 365 and got a minimum grade of B. The course assumes that you have some basic knowledge of R.

Textbook

There is no single textbook for this course, and lecture notes and readings will be available on the Brightspace website. The following three books, however, are highly recommended.

- Greene, W. *Econometric Analysis*. Pearson, 8th ed.
- Hansen, B. E. *Econometrics*. Princeton University Press.
- Hanck, C., Arnold, M., Gerber, A., and Schmelzer, M. *Introduction to Econometrics with R*. https://www.econometrics-with-r.org/

Note: *The first two books are excellent and challenging books that approach regression from a conditional expectation approach. They cover most of the topics in this course. I will not assign any textbook readings, however, you are expected to read the corresponding chapters for each topic covered. The materials posted on Brightspace are meant solely for students attending ECON 366 this semester. You do not have the instructor's permission to supply the ECON 366 course materials to any sites.*

Grading

The course involves lectures and labs. The course grade will base on assignments, lab quizzes, midterm exam, and final exam (not cumulative), which are intended to be a comprehensive examination of how closely you have managed to fulfill the stated objectives of the course. Details will be discussed in class.

- **Assignments (40%):** This is a methodological course, developing skills in understanding and applying econometric methods. You can only learn metrics by doing assignments. There will be four assignments for this course. Assignments will be posted to Brightspace and announced approximately one week before they are due. You should turn in a hard copy of your homework before class on the day they are due. You may work on the assignments with your classmates, which is encouraged. But you must write up your answers independently! Assignments submitted by students that are discovered to be identical or nearly identical will receive a zero grade. All of the assignments will help you prepare for the exams.

- **Lab Quizzes (10%):** We need to navigate through technical dexterity and empirical relevance. Labs, supervised by the TA in this course, will consist of applied econometric work using R and assignment problem review. It is expected that all of you will attend labs. You need to answer a short question in each lab and submit it to your TA. These quizzes are based on class lecture, aim to quickly review recently covered material, and give you feedback on how well you are learning the course. At the end of the semester, the lowest two quiz scores will be dropped. Since we have two rooms for lab classes, there will be an advance announcement on which room to go to for the lab for that week.

- **Midterm Exam (20%):** The midterm exam will be held in class. Although the R programming language is used to apply econometric techniques to data, the exam will solely involve paper and pencil. The material covered by the midterm will be announced in advance and I also will provide a review session before the exam. All grades of exams are final except for correcting obvious grading mistakes. For example, points are added up incorrectly, or obviously correct answers are mistakenly marked wrong. Please bring these to my attention within one week following the return of the exam. There will be no makeup midterm exam. If you miss the

midterm for a documented reason (i.e., illness or emergency) and obtain evidence from a doctor or other relevant staff, then your final exam will receive a total weight of 50%. If you miss the midterm without a valid documentation, you will automatically lose the 20% of the full mark.

- **Final Exam (30%):** The final exam will take place during the time slot allocated by the university. The final exam is not comprehensive and only covers the topics after the midterm. On the last day of this course, there will be a review session for the final. If you miss the final exam and has a valid documentation, you will be required to take a makeup exam administered by the department at the officially announced day and time. If you miss the final exam without a valid documentation, you will not have chance to retake the final and will receive zero for the final exam.

  Note: *(1) It is not appropriate to request grade adjustments or special extra credit chances after presenting unsatisfactory performance for an assignment or exam or failing to receive the grade you had hoped for. These requests will not be granted. However, I do reserve the right to raise every student's grade by the same amount or offer an opportunity for extra credit to all students if scores on an assignment or exam are low across most or all students (but such events are rare). (2) For both midterm and final exams, you will be allowed to bring a "formula sheet"—either handwritten or typed on both sides of an 8 1/2×11-inch sheet of paper. Exams do not require a calculator, computer, mobile phone, or any other electronic device. No electronic devices are allowed during exams.*

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. 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.

Course Policies

This course adheres to the Undergraduate Course Policies of the Department of Economics that deal with the corresponding issues. The following policies/suggestions are explicitly included because of their importance.

You will not be graded on attendance. However, attendance is required to receive credit for quizzes and exams. You are also expected to treat everyone in the classroom with respect. Getting to class late, sleeping, talking out of turn, using your cell phone or other devices, or otherwise being distracted and distracting, are not acceptable classroom activities. Please let me know immediately if you have a health problem or disability that necessitates leaving the room during class time, or if you have a conflict that regularly prevents you from getting to class on time.

Consideration for missed assignments, quizzes, and exams will be given only on the basis of documented illness (in-line with the University's policies at the time), accident, or family affliction, and for no other reasons. You will receive a grade of zero on the missed assignments, quizzes, and exams if no valid excuse is presented. Students

are advised not to make work or travel plans during lecture hours to be able to attend all classes and labs. There will be no special accommodation if travel plans conflict with quizzes or exams.

The rule of thumb in college is that you study for at least 2 hours outside of class for each hour you spend in class. This means you should spend a minimum of 6 hours per week studying for ECON 365. Please know that econometrics is a cumulative process, with each step building on the previous foundations. Please do not fall behind! I want you to perform well in this class! If you become concerned about your progress, please see me immediately. Please come to office hours if you have any questions about the material covered in this course.

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. The University reserves the right to use a plagiarism software to detect violations of academic integrity (including unauthorized use of ChatGPT and other Artificial Intelligence). This applies to all exams and submitted work. Should you violate this rule, you will have violated UVic's academic integrity policy and a complaint against you under this policy will be filed accordingly.

Student Code of Conduct

We are all responsible for creating a learning environment that is welcoming, inclusive, equitable, and respectful. The Humanities, Science, and Social Sciences Faculties have adopted this Student code of conduct.

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.

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 Liason 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.

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.

Brightspace

Brightspace is used extensively for the course. All students are expected to be fully functional with the system. The lecture notes, problem sets, and labs will be posted in *Brightspace* Please note that the lecture notes online are only outlines of the actual lectures, and additional material may be covered during the 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.

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 whose answers involve explaining course material should be asked during office hours or in class. Should you send an email for whatever reason, please use your UVic email address and do put "ECON 366" in the subject line. I will strive to respond to your course emails within 24 hours.

Electronic Devices

The statistical program R will be used extensively in this course for all applied econometric analysis. R is freely available across platforms. I also recommend using RStudio as a tool for writing code in R, which is an interface for using R. You are encouraged to install R and RStudio on your personal computers based on your operating system (Windows, Mac, etc.). For this course, TA will teach you how to code in R from basics. Nevertheless, it is your responsibility to read up on R and fully learn how to perform the required analysis. R Bloggers is a website dedicated to R related materials.

AI Use Policy

AI tools may be used to review concepts or check notation, but all econometric analyses, derivations, and written interpretations must be completed independently. AI may not be used to generate solutions, perform analyses, or produce answers for assignments, problem sets, or exams. Any AI use beyond basic proofreading must be disclosed in a brief note. Improper or undisclosed use of AI will be treated as an academic integrity violation.

Course Schedule

Below is a list of topics for this course. This is a preliminary schedule, which is meant to serve as an outline and guide. Depending on time constraints, we may choose to not cover some of the topics below.

Topic	Important Dates
Topic 1: Review of Matrix Algebra and Statistics	Jan 29th Assignment 1 deadline
Topic 2: Multiple Regression	Feb 23rd Assignment 2 deadline
Topic 3: GLS Estimation	Feb 23rd Review for Midterm Exam
Topic 4: Ridge Regression	Feb 26th Midterm Exam (During class time)
Topic 5: Instrumental Variables Estimation	March 19th Assignment 3 deadline
Topic 6: Measurement Error Models	April 2nd Assignment 4 deadline
Topic 7: Seemingly Unrelated Regression Equations Models	April 2nd Review for Final Exam
Topic 8: Simultaneous Equations Models	
Topic 9: Probit and Logit Models	
Topic 10: Time Series: AR(p) & MA(q)	
Topic 11: Time Series: ARIMA(p,d,q)	
Topic 12: Panel Data Models	
Topic 13: Quantile Regression	
Topic 14: Machine Learning Methods	

Note: *Assignment will be collected during the lecture on the due date. All assignments contribute to your final grade, and no assignment scores will be dropped.*