University of Victoria | Economics

ECON 246 A01
Statistical Inference

Winter Session: 2024 09 – CRN 11097, 1.5 Unit Value,

Contact hours:

Lecture MTH 8:30 - 9:50 a.m. Cornett A120

Labs Tuesday: B01: 1:30 pm BEC 180

B02: 2:30 pm BEC 180

UVic Land Acknowledgement

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

Instructor Name: Betty Johnson

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E-Mail: bettyj@uvic.ca

Office Hours: Zoom by appointment or Wednesday 11:30-12 noon. Join Zoom Meeting

https://uvic.zoom.us/j/85954196275?pwd=T0xCN2NQcTlzL0xRNW51QzluUHJjUT09

TA Name: Mohammad Sheikhi

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Office Hours: TBA

Course Content

Economics 246 is the second building block of statistical analysis. Economics 245: Descriptive Statistics, introduced elementary descriptive statistics (i.e. mean, median, mode, variance, percentiles, etc.), techniques to analyze raw data (i.e. R, Excel, EViews applications) and basic probability theory (cumulative density functions, probability density functions, integration, etc.). **Economics 246** launches into statistical inference.

This course introduces the statistical tools necessary to legitimately analyze and interpret data, with emphasis on economic data and economic applications. Readily available personal computers have created an atmosphere where misuse and misinterpretation of data is commonplace. Hence, a proper knowledge and understanding of statistical concepts is crucial in order to avoid inferential mistakes and inaccurate forecasts. At the conclusion of this course, you will have achieved: 1) the skills necessary to critically assess statistical results and 2) the development of a certain level of _skepticism_ regarding commonly published economic theories and statements.

Economics 246 is presented in two components. In the first half of the course, we will focus on using sample measures to infer something about the characteristics of a population. Using sample data, we undertake the task of estimating (quantitative) statements made about the population. Through proper testing techniques, we can validate these statements.

In the second half of the course, we apply our inferential techniques to the linear regression model. This model allows us to statistically examine relationships between economic variables. We can then use the estimated regression relationship as a tool to quantitatively test economic theories. This is known as econometrics. Hence, practical questions about economic phenomena can be answered in a systematic, legitimate and appropriate manner.

Learning Outcomes

Economics 246 is the second of a series of courses dealing with statistics and econometrics. At the end of the course students should:

- _Understand how to appropriately deal with describing and analyzing basic data sets using economic data._
- _Perform simple hypothesis testing and probability._
- _Apply the Standard normal distribution, t-distribution, Chi-square distribution, F-distribution to solve probability based problems._
- _Summarize sample data effectively and logistically_
- _Estimation procedures executed correctly_
- _OLS regression and correlation analysis applied to economic data to develop models with an understanding of basic econometric issues._
- _Enhance their personal understanding of Canadian data collection agencies._
- _Compiled an R library of script._

Course prerequisites/corequisites

- Complete all of the following
- Complete 1 of:
  - ECON245 - Descriptive Statistics and Probability (1.5)
  - STAT260 - Introduction to Probability and Statistics I (1.5)
- Complete 1 of:
  - MATH100 - Calculus I (1.5)
  - MATH102 - Calculus for Students in the Social and Biological Sciences (1.5)
  - MATH109 - Introduction to Calculus (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

https://collection.bccampus.ca/textbooks/introductory-statistics-openstax-200/

Author	Barbara Illowsky and Susan Dean
Publisher	OpenStax
Publish Date	2013
Level	Undergraduate
License	CC BY 4.0

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

None

Grading

Grading Scheme

The course grade is determined as follows: There are three in-person midterm exams, three homework assignments (on Brightspace) and 10 lab assignments (Brightspace). All exams, assignments and labs are required. There will be an online comprehensive last day of class exam on Brightspace (also required).

The course grade is determined as follows:

3 homework assignments, each carrying a weight of 5%.

3 in-person midterm exams, each carrying a weight of 20%.

10 lab assignments, each carrying a weight of 1%, for a total of 10%.

Last day exam worth 15%.

Mandatory/Essential Course Components

All exams are essential course requirements, meaning, they must be attempted in order to pass the course. Note that essential course requirements are deferrable, the final exam is considered essential and thus deferrable by definition.

Dates of Assessments, Due Dates of Assignments

Assignment(s): Assignments are posted on Brightspace. Please upload your assignment by midnight on the due date:
Assignment #1 -- due Sept 28
Assignment #2 -- due Oct 26
Assignment #3 -- due Nov 23

Midterm(s): The midterm exams are scheduled for October 3, October 28 and November 25 during class time. Information and coverage will be available one week before the exam.

Final exam: Last day of class (December 2nd)

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 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 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.

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.

Course Structure

Topic	Chapter	Week	Due Dates and Exam Information
Topic 1 Introduction Sampling and Sample design	Chapter 1: pages 17-26 Chapter 7	1	
Normal Distribution and CLT	Chapter 8.1, 8.2	2	
T-distribution, Chi-square distribution	Chapter 11.1	3	Labs start Tuesday
Topic 2: Estimator Properties Interval Estimation	8.4-8.6	4	Assignment #1 due Sept 28
Midterm 1		5	Sept 30 Stat Holiday Midterm #1 October 3
Topic 2 Interval estimation	8.6	6	
Topic 3 Hypothesis testing Introduction	9	7	Thanksgiving October 14 (No class on Monday)
Hypothesis testing single sample	9	8	Assignment #2 due October 26
Hypothesis test on the variance	9	9	Midterm October 28
Multi-sample hypothesis tests	10, 11	10	Reading Break Nov. 11
Topic 4: Regression Analysis	12	11	
Regression and Gauss Markov	12	12	Assignment #3 due on November 23
Correlation and Review	12	13	Midterm #3 November 25
Comprehensive exam		14	Online exam Dec 2

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.

Electronic Devices

Use what you need in lecture and labs.

Educational Technology involving storage outside Canada

N/A