



# ECON 246 A01

## Statistical Inference

Summer Session: 2024 05 – Term 3, CRN 31302, 1.5 Units Value

Lecture TWF 8:30 -10:20 pm MAC D115

Labs TW B01 2:30 pm BEC 170; B02 3:30 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**

**Office:** BEC 324

**E-Mail:** [bettyj@uvic.ca](mailto:bettyj@uvic.ca)

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

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

**TA Name: Erick**

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**Office Hours:** TBA

**TA Name: Cayley**

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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.

Course prerequisites/corequisites

### Prerequisites

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- 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 \(1.5\)](#)
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## 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/>



<b>Author</b>	Barbara Illowsky and Susan Dean
<b>Publisher</b>	OpenStax
<b>Publish Date</b>	2013
<b>Level</b>	Undergraduate
<b>License</b>	<a href="#">CC BY 4.0</a>

## 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

TBA

## Grading

### Grading Scheme

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%.

Final 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.*

*If a student misses an exam the weight from the missed exam will appear on the final exam.*

### 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 July 10**

**Assignment #2 -- due July 24**

**Assignment #3 -- due August 7**

**Midterm(s):** The midterm exams are scheduled for July 12, July 26 and August 9 during class time. Information and coverage will be available one week before the exam.

**Final exam:** Last day of class (August 16<sup>th</sup>)

### 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%

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](#).

[https://www.uvic.ca/students/academics/academic-concessions-accommodations/request-for-academic-concession/forms/uvic\\_undergraduate\\_request\\_for\\_in-course\\_extension.pdf](https://www.uvic.ca/students/academics/academic-concessions-accommodations/request-for-academic-concession/forms/uvic_undergraduate_request_for_in-course_extension.pdf)

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](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).

## 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](mailto: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](mailto: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

### **Week 1**

Topic: Introduction  
Sampling and Sample design  
Normal distribution  
CLT  
Chapter 1 Pages 17-26  
Chapter 7  
Chapter 8: Section 8.1, 8.2

### **Week 2**

Topic 1 continued:  
t-distribution  
Chi-squared distribution  
Topic 2: Estimator Properties  
Interval Estimation

Chapters 11.1, 8.4-8.6  
Due Dates: Assignment #1 July 10  
Exam Info: Midterm #1 July 12  
Labs start: July 9

### **Week 3**

Topic 2 Continued: Interval estimation  
Topic 3 Hypothesis testing  
Chapter: 9

### **Week 4**

Topic 3: Hypothesis Testing  
Chapter: 9  
Due Dates: Assignment #2 due July 24  
Exam Info: Midterm #2 July 26

### **Week 5**

Topic 3: Hypothesis testing with two samples  
Chapters 10 & 11

### **Week 6**

Topic: Regression and Correlation Analysis  
Chapter: 12  
Due Dates: Assignment 3 due August 7  
Exam Info: Midterm 3 August 9

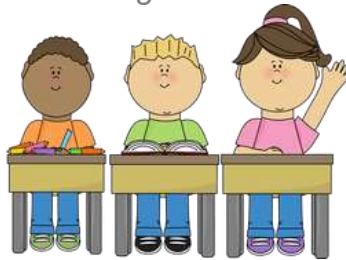
### **Week 7**

Finish up  
Exam Info: Comprehensive Final exam August 16

## 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.*
- *Standard normal distribution, t-distribution, Chi-square distribution, F-distribution*
- *Deal with sample data effectively*
- *Estimation procedures*
- *OLS regression and correlation analysis*
- *Enhance their personal understanding of Canadian data collection agencies.*



## 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.

<b>Week #</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>(1)</b> <b>July 1</b>	1	2 No labs	<b>3</b> No Labs	4	5
<b>(2)</b> <b>July 7</b>	8	<b>9</b> Labs start	<b>10</b> Assignment 1	11	<b>12</b> Midterm 1
<b>(3)</b> <b>July 14</b>	15	16	17	18	19
<b>(4)</b> <b>July 21</b>	22	23	<b>24</b> Assignment 2	25	26 Midterm 2
<b>(5)</b> <b>July 28</b>	29	30	31	1	2
<b>(6)</b> <b>August 4</b>	5 BC Day	6	7 Assignment 3	8	9 Midterm 3
<b>(7)</b> <b>August 11</b>	12	13	14	15	<b>16</b> Final Exam