

**ECONOMETRICS I
ECONOMICS EC2222A-002
Department of Economics
Western University**

September 2024

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Office hours: 3:00pm to 4:00pm on Mondays and 1:30pm to 2:30pm on Tuesdays
Delivery mode: In-person
Meeting time(s): 2:30pm to 3:30pm on Tuesdays and 1:30pm to 3:30pm on Thursdays
Classroom: UCC-41
Course website: <https://westernu.brightspace.com/>
Undergraduate inquiries: 519-661-3507 or SSC Room 4078 or econugrd@uwo.ca

Registration:

You are responsible for ensuring you are registered in the correct courses. If you are not registered in this course, the Department will not release any of your marks until your registration is corrected. You may check your timetable by using the Login on the Student Services website at <https://student.uwo.ca>. If you notice a problem, please contact your home Faculty Academic Counsellor immediately.

Prerequisite/Antirequisite Note:

Prerequisite(s): Economics 1021A/B and Economics 1022A/B, or Economics 2001A/B; and Calculus 1000A/B (with a mark no less than 60%) or Calculus 1500A/B (with a mark no less than 60%).

Antirequisite(s): Biology 2244A/B, Economics 2122A/B, Geography 2210A/B, Health Sciences 3801A/B, MOS 2242A/B, Psychology 2811A/B, the former Psychology 2810, the former Psychology 2820E, Psychology 2830A/B, Psychology 2850A/B, Psychology 2851A/B, Social Work 2207A/B, Sociology 2205A/B, Statistical Sciences 2035, Statistical Sciences 2141A/B, Statistical Sciences 2143A/B, Statistical Sciences 2244A/B, Statistical Sciences 2858A/B. Students wishing to enroll in higher-level courses in the Department of Statistics and Actuarial Sciences are encouraged to consult that department. This course cannot be taken concurrently with or prior to taking Data Science 1000A/B as they will become antirequisites to one another in these sequences.

You are responsible for ensuring that you have successfully completed all course prerequisites, and that you have not taken any anti-requisite courses. Lack of prerequisites may not be used as a basis for appeal. If you are found to be ineligible for a course, you may be removed from it at any time and you will receive no adjustment to your fees. This decision cannot be appealed.

If you find that you do not have the course prerequisites, it is in your best interest to drop the course well before the end of the add/drop period. Your prompt attention to this matter will not only help protect your academic record but will ensure that spaces become available for students who require the course in question for graduation.

Course Description:

An introduction to econometric description and inference which covers: basics of probability theory; discrete and continuous probability distributions; random variables; expectations; sampling theory; definition of a statistic; estimation; confidence intervals and tests of hypotheses; linear regression. Central to the course are applications of probability theory and statistics in economics.

Course Objectives:

The primary objective of the course is to provide students a working knowledge of probability theory and statistics, with a focus on the topics enumerated in “Course Description.” Another related objective is to prepare students for more advanced courses in economics and statistics.

Course Learning Outcomes:

I expect that, at the end of the course, students will be able to:

- State the definition of the following concepts: probability distribution, random variable, expectation, mean, variance, median, quantile, sample, statistic, estimator, null hypothesis; power and size (in relation to hypothesis testing); confidence interval; ordinary least squares; R-squared; and t-statistic.
- State the axioms of probability;
- Determine and manipulate probability density functions, probability mass functions, and cumulative probability functions;
- Compute expectations, densities, and quantiles given probability distributions;
- Perform and interpret hypothesis tests; and
- Perform and interpret linear regressions.

Textbook(s) and Course Materials:

The course textbook is:

- *Statistics For Business and Economics*. Newbold, Carlson, and Thorne. Pearson (8th ed.)

Technical requirements:

We will be using spreadsheets to analyze data in this course. Thus, access to a computer with spreadsheet software (e.g., Google Sheets or Microsoft Excel) is required.

Assessments and Grading:

There will be five assignments, a midterm exam, and a final exam. A student's final grade is determined as a weighted average of the student's grades on these assessments with the following weights:

- Assignments: 20%
- Midterm exam: 30%
- Final exam: 50%

The midterm exam will cover course material up until the class before the exam. The final exam will be cumulative and cover all course material. The tentative date for the midterm exam is Thursday, October 10, 2024. The exam will take place during our usual Thursday class time in our usual classroom from 1:40pm to 3:10pm (90 minutes).

Students may not use materials other than writing utensils during the exams. Prohibited materials include calculators and all other electronics.

A student's grade for assignments will be determined by averaging the student's grades across the four assignments for which the student's grade was the highest. To illustrate, if the student scored 90% on four assignments and 50% on the fifth, the student's assignment score would be 90%.

There will not be a make-up midterm exam. Instead, students who are unable to attend the midterm will have the midterm exam's weight in determining the final grade transferred to the final exam. For a missed midterm, you must take your documentation to Academic Counselling within 48 hours of the exam. Notify your instructor within 24 hours of the missed assessment that you have missed the quiz or midterm. Failure to meet these deadlines may result in the instructor assigning a grade of zero. For illnesses, you must print off a medical certificate and take it to the doctor, which you bring to Academic Counselling. The medical certificate can be found at https://studentservices.uwo.ca/secure/medical_document.pdf.

The university's [*new academic consideration and flexibility in assessment*](#) policy permits each student to miss one assessment per course per term without medical documentation while allowing faculty to designate one assessment per course for which students cannot self-attest. Students may not self-attest for the final exam. I have chosen to disallow students from self-attesting for the midterm exam. Note that medical documentation is required to miss the midterm exam without penalization even though there is no make-up midterm. You may not self-attest for an assignment that is not used in calculating your grade. This means that you may not self-attest for an assignment, given that only four of the assignments are used in computing your final grade.

Students who miss the final exam must take their documentation to Academic Counselling and notify the instructor within 24 hours. There will be a makeup date set by the instructor. The makeup may differ in length and format from the originally scheduled exam.

The tentative due dates of the assignments are: September 24, October 22, November 5, November 19, and December 3).

Communication:

Please email me if you have any questions or comments relating to the course.

Course plan (tentative):

The textbook chapters corresponding to each topic are indicated at the end of each bullet point in parentheses.

- Week 1 (September 5): review of outline, introduction to probability theory (ch. 3)
- Week 2 (September 10 and 12): probability theory, continued (ch. 3)
- Week 3 (September 17 and 19): probability distributions (ch. 4 and 5)
- Week 4 (September 24 and 26): probability distributions, continued (ch. 4 and 5)
- Week 5 (October 1 and 3): probability distributions, continued (ch. 4 and 5)
- Week 6 (October 8 and 10): cumulative review of course topics and midterm exam
- Week 7 (October 22 and 24): sampling theory (ch. 6)
- Week 8 (October 29 and 31): sampling theory (ch. 6)
- Week 9 (November 5 and 7): confidence intervals and hypothesis testing (ch. 7–10)
- Week 10 (November 12 and 14): confidence intervals and hypothesis testing, continued (ch. 7–10)
- Week 11 (November 19 and 21): confidence intervals and hypothesis testing, continued (ch. 7–10)
- Week 12 (November 26 and 28): linear regression (ch. 11)
- Week 13 (December 3 and 5): linear regression and course review (ch. 11)

PLEASE NOTE
DEPARTMENT & UNIVERSITY POLICIES FOR FALL 2024

The University expects all students to take responsibility for their own Academic Programs. Students should also check their registration to ensure they are enrolled in the correct courses.

1. **Guidelines, policies, and your academic rights and responsibilities** are posted online in the current Western Academic Calendar at: <http://westerncalendar.uwo.ca>. Claiming that “you didn’t know what to do” is not an acceptable excuse for not following the stated policies and procedures.
 2. A [*new academic consideration and flexibility in assessment*](#) policy is in effect starting September 2024. Students can miss one assessment per course per term without medical documentation. Faculty can designate one assessment per course for which students **cannot** self-attest.
 3. Students must familiarize themselves with the “**Rules of Conduct for Examinations**” http://www.uwo.ca/univsec/pdf/academic_policies/exam/administration.pdf.
 4. **Cheating as an academic offence:** Students are responsible for understanding what it means to “cheat.” The Department of Economics treats cheating incidents very seriously and will investigate any suspect behavior. Students found guilty will incur penalties that could include a failing grade or being barred from future registration in other Economics courses or programs. The University may impose further penalties such as suspension or expulsion.
 5. **Plagiarism:** Students must write their essays and assignments in their own words. When taking an idea/passage from another author, it must be acknowledged with quotation marks where appropriate and referenced with footnotes or citations. Plagiarism is an academic offence (see Scholastic Discipline for Undergraduate Students in the Western Calendar at http://westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_20).
- Western University uses software to check for plagiarism and students may be required to electronically submit their work. Those found guilty will be penalized as noted in point 4.
6. It is a Department of Economics policy that **NO** assignments be dated, stamped or accepted by staff. Students must submit assignments to the instructor.
 7. **Appeals:** University policies and procedures for appealing a mark can be found in the Student Academic Appeals section in the current Western Academic Calendar at: http://westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_14. **Please note the relevant deadlines.**

Department of Economics procedures for appealing a mark can be found here: https://economics.uwo.ca/undergraduate/program_counselling/responsibilities_policies.html#appeals. The Department will not consider an appeal unless an attempt has been made to settle the matter with the instructor first. Students who remain dissatisfied with the outcome may proceed to submit an appeal to econugrd@uwo.ca. Please follow the instructions and use the appeal form shown in the above link.

8. **Systematic adjustments of a class grade distribution** (either up or down) can occur in Economics courses. The fact that grades have been adjusted is **not** grounds for an appeal.

9. **ADD AND DROP DEADLINES:**

- Deadline to **ADD** first term full or half course: **Fri, Sept 13, 2024**
- Deadline to **DROP/WITHDRAW** first term full or half course: **Mon, Dec 2, 2024**

Policy Regarding Makeup Tests and Final Examinations

Faculty of Social Science policy states that oversleeping or misreading an exam schedule is NOT grounds for a makeup. This rule applies to midterm and final exams in the Department of Economics.

Policies Regarding Academic Accommodation

- Academic accommodation will not be granted automatically on request. Students must demonstrate by documentation that there are compelling medical or compassionate grounds before academic accommodation will be considered. The Faculty of Social Science's policies on academic accommodation are found at https://counselling.ssc.uwo.ca/procedures/academic_consideration.html
- **Accommodation for Students with Disabilities:** Students with disabilities or accessibility challenges should work with Accessible Education (formerly SSD, see http://academicsupport.uwo.ca/accessible_education/index.html), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here: [Academic Accommodation for Students with Disabilities](#).
- **Rewriting Exams and Retroactive Reweighting are NOT Permitted:** Students who proceed to write a test or examination must be prepared to accept the mark. Rewriting tests or examinations, or retroactive reweighting of marks, is **not** permitted. Students must also book travel arrangements AFTER final exam dates have been posted as they must not conflict with test or final exams.
- Unless medically incapable of doing so, students must notify their instructor prior to the test date or at least within **48 hours** when requesting a makeup exam. Failure to follow this procedure may result in denial of academic accommodation and a grade of zero. Students

should also set up an appointment as soon as possible to meet with their instructor. If the instructor is not available, send an email message to the instructor, copying the Undergraduate Coordinator at econugrd@uwo.ca. **Notifying instructors of a missed exam does not automatically entitle students to a makeup.**

- For medical illnesses, students may consult Student Health Services and request a Student Medical Certificate from the physician. If assessed by an off-campus doctor, students must obtain a certificate from his/her office at the time of the visit/assessment. Student Medical Certificate (SMC) is available here:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf
- **Documentation for Accommodation:** Individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds or for other reasons.
- **Western University policy on Consideration for Student Absence** is available here:
https://counselling.ssc.uwo.ca/procedures/probation_rtw/appeals.html
- **Religious Accommodation:** Students should consult the University's list of recognized religious holidays and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the [Western Multicultural Calendar](#).

Policy Regarding Class Attendance and Engagement: If the instructor deems a student's attendance or engagement in the class to be unsatisfactory, that student may be prohibited from writing the final examination. Examples of unsatisfactory class engagement include frequent absences from an in-person or synchronous online class, lack of assignment submissions, and inadequate use of online course materials. Instructors who intend to make use of this policy will notify the student in advance.

Statement on Mental Health and Support Services: Students under emotional/mental distress should visit http://uwo.ca/health/mental_wellbeing/ for more information and a complete list of resources on how to obtain help.

Statement on Remote Proctoring: While Western intends to hold most classes, mid-terms and finals in-person, the London-Middlesex Health unit may require western to teach in a remote format. If this occurs, all assessments will be done remotely and may involve the use of remote proctoring software (i.e., Proctorio, ProctorTrack). Instructors will provide information on the details should the need arise.

Guidelines for Essay Courses

Essay Courses¹

An essay course is a course in which the cumulative amount of written work, excluding written work in examinations, is at least 2,500 words (for a half course).

To pass an essay course, students must exhibit a minimal level of competence in essay writing in addition to comprehension of the course content.

English Language Proficiency for Assignment of Grades²

Written work that demonstrates a lack of English proficiency will be failed or, at the discretion of the instructor, returned to the student for revision to an acceptable level.

To foster competence in the English language, *all instructors will take English proficiency into account when marking*. This policy applies to all courses, not only essay courses.

Recycling of Assignments

Students are prohibited from handing in the same paper for two different courses. Doing so is considered a scholastic offence and will be subjected to academic penalties.

Plagiarism

Plagiarism is defined as “the act or an instance of copying or stealing another’s words or ideas and attributing them as one’s own.”³

Plagiarism applies to ALL assignments including essays, reports, diagrams, statistical tables, and computer projects. Examples of plagiarism include:⁴

- Submitting someone else’s work as your own
- Buying a paper from a mill, website or other source and submitting it as your own
- Copying sentences, phrases, paragraphs, or ideas from someone else’s work, published or unpublished, without citing them
- Replacing selected words from a passage from someone else’s work and using it as your own without citing them
- Copying multimedia (graphics, audio, video, internet streams), computer programs, music compositions, graphs, or charts from someone else’s work without citing them
- Piecing together phrases and ideas from a variety of sources without citing them
- Building on someone else’s ideas or phrases without citing them

Plagiarism is a serious scholastic offence. Possible consequences of plagiarism include a mark of 0% on the assignment, a mark of 0% for the course, and expulsion from the university.

¹From the UWO Academic Handbook. See

http://www.uwo.ca/univsec/pdf/academic_policies/registration_progression_grad/coursenummering.pdf

² From the UWO Academic Handbook. See http://www.uwo.ca/univsec/pdf/academic_policies/exam/english.pdf

³Excerpted from HC Black, *Black’s Law Dictionary*, West Publishing Co., 1999, 7th ed., p. 1170.

⁴ Adapted from the San José State University Plagiarism Tutorial <https://libguides.sjsu.edu/plagiarism>

Instructors may require students to submit written work electronically to <http://www.turnitin.com>. This is a service that assists instructors in detecting plagiarism.

Students seeking further guidance on avoiding plagiarism should consult their instructor. ***Claiming ignorance is not an acceptable excuse.***

The key to avoiding plagiarism is to correctly cite reference sources.

Referencing and Citation Guidelines

The Economics Department has adopted the citation guidelines used in *The Chicago Manual of Style*, 16th edition. Chicago: University of Chicago Press, 2010. You can find an online version on the Western Libraries website. Go to <https://www.lib.uwo.ca/essayhelp/index.html> and click on 'style guides'. For off-campus access, use the *OffCampus Access* sign-in on the Library's homepage.

Economics papers often use the in-text **author-date** style of citations and references. Details and examples of this style are shown in chapter 15 of the *Chicago Manual of Style Online*. See also the handy "Chicago-Style Citation Quick Guide" under Tools on the homepage.

In the body of an essay, in-text citations list the last names of the authors of the piece that are referenced, the year of publication, and, where relevant, page numbers. In-text citations refer the reader to a complete list of bibliographic references at the end of the essay. Papers that cite multiple works by the same author(s) with the same publication year should add a lower case letter after the date in both the in-text citation and References (e.g., 1993a and 1993b). In doing so, the in-text citation points the reader to the relevant work.

Examples of in-text citations:

Diamond (1981, 1982) and Mortensen (1982a, 1982b) find these externalities can cause an inefficient level of search activity...

The "new view of unemployment" which emerged during the 1970s emphasized the importance of turnover in the labour force and the brief duration of many employments spells (Hall 1970, 1972; Perry 1972; Marston 1976).

The primary objectives of the LMAS are "1. To provide measures of the dynamic...the Labour Force Survey" (Statistics Canada 1990, 5).

The list of references at the end of the essay should be titled References or Works Cited. It should provide complete bibliographic information about each source cited. In addition, students should also provide adequate referencing of any data sources. This can be done in a data appendix following the text of the paper and before the References.

Examples of the format and content of references can be found here:
<https://www.lib.uwo.ca/files/styleguides/ChicagoStyleAuthorDate.pdf>

Writing an Economics Essay: Starting Points

To start a written assignment, review your professor's instructions. Read published work written by economists, which will give you examples of the structure and content of economics writing. Examples are readings in the course outline, journals, working papers, etc.

Two helpful sources that give information about how to write for economics are:

McCloskey, Dierdre N. 2000. *Economical Writing*, 2nd edition. Prospect Heights, Illinois: Waveland Press.

Greenlaw, Steven A. 2006. *Doing Economics: A Guide to Understanding and Doing Economic Research*. New York: Houghton Mifflin Co.

Writing an Economics Essay: Resources

The **Resources Link** on Western University's Department of Economics website (<http://economics.uwo.ca/resources/index.html>) provides a link to a list of sources for published and unpublished economic papers, articles, books, theses, government publications, data, etc. Western Libraries has a very useful economics resource page <https://guides.lib.uwo.ca/economics>.

DB Weldon Library has a collection of bibliographies, indexes, handbooks, and periodicals in economics. Library holdings, the online library catalogue, and other resources are available electronically from the Western Libraries Homepage <http://www.lib.uwo.ca/>. These can be accessed off-campus with the OffCampus Proxy Server on the Library main page.

Students are encouraged to take a library orientation tour to learn about where sources of information are located both physically and online. Consult library staff for questions

The New Palgrave Dictionary of Economics is the most comprehensive dictionary of economics in existence today. It is available online through the library catalogue, or in print in the Weldon's Reference section (call # HB 61.N49 2008 v. 1-8).

EconLit (*Economic Literature*) is an electronic bibliography of literature from 1969 to the present. It covers journals, collected articles, books, book reviews, dissertations, and working papers. It also provides citations, selected abstracts, and links to Western's full-text resources. Students can also print records by downloading marked records to a text file, sending marked records by email, or exporting them to a citation manager such as *Zotaro*. For a list of citation software, see <https://www.lib.uwo.ca/essayhelp/citationmanagementsoftware.html>.

CANSIM (Canadian Socio-economic Information Management System) is Statistics Canada's database of time series data covering a variety of economic aspects of Canadian society. Access the database by a Title Search on the Western Library's Catalogue, or from the Library's list of Databases under "Research Tools" on the Library's homepage.

Western Undergraduate Economics Review (WUER)

The Department of Economics encourages students to consider submitting their essays to the *Western Undergraduate Economics Review*, a journal published annually by the Department that showcases student work in economics. For further information, please visit http://economics.uwo.ca/undergraduate/undergraduate_economics_review.html.

Essay Prize in Economics

Two prizes may be awarded at the end of the academic year. One prize is for a student registered in a 2100 level course, and one is for a student registered in a 2200 or higher level course. Each prize is valued at \$500.

Students can only win the Essay Prize in Economics once. Economics 4400E is not eligible for this prize as it has its own essay award.

Instructors will nominate student essays for the prize. The essay should be submitted to the Undergraduate Coordinator for consideration by the Essay Prize Committee, which will decide the winner. The Essay Prize Committee will consist of the Undergraduate Program Director, WUER Faculty Advisor and one other faculty member. The decision of the Committee is final and cannot be appeal.

Papers will be judged on content, originality, use of references, spelling, and grammar.

The grade given to the paper will not influence the decision of the Essay Prize Committee as all comments by the original marker will be removed.

The deadlines for instructor submissions are:

Fall courses: January 1st

Winter courses: May 1st

The winner of the essay prize is encouraged to submit their paper to the Western Undergraduate Economics Review. Other appropriate papers may also be submitted. Appropriate papers may also be submitted.