ECO220: Introduction to Data Analysis and Applied Econometrics

Course Outline for Section L0101, Summer 2026

1 Instructor Information

First Half [May/June]
Instructor: Alison Cane
E-mail: a.cane [at] mail.utoronto.ca
Student Hours: TBD, in person (office GE072) and online

Second Half [July/August]
Instructor: Tam Le
E-mail: tamle.le [at] mail.utoronto.ca
Student Hours: TBD

Data Analysis Course Module (DACM)
Instructor: Samantha Grewal
E-mail: samantha.grewal [at] mail.utoronto.ca
Student Hours: TBD, in person (office GE038) and online

Teaching Assistant: Neil Adam
Student Hours: TBD, online

2 Course Information

2.1 Meeting Times and Location

All lectures are expected to be in-person for the duration of the term, including scheduled make up dates for university holidays (see the course calendar on Quercus). If a lecture needs to be online, an announcement will be made in advance via Quercus. Lectures will not be recorded, so if you miss a class, it is your responsibility to make up for the material that you missed. We meet:

- Mondays and Wednesdays [11AM - 1PM] at OI 2212
- Fridays [11AM - 1PM] at ES 1050 (note Friday's location may be different some weeks, this will be announced in class and on Quercus)

2.2 Prerequisites

The course prerequisites are listed on the university's Academic Calendar. Students missing any prerequisites will be removed by an administrator - this is not something the course instructors can control.

2.3 Course Overview

The purpose of this course is to provide a comprehensive introduction to econometric methodology and data analysis. The content can be separated into four major sections:

1. **Understanding Data:** The collection, processing, and interpretation of raw data.
2. **Probability:** The mathematical tools we use to quantify uncertainty.
3. **Statistical Inference:** The use of probability to infer characteristics from a population using a sample of data.
4. **Regression:** Building and understanding statistical models of economic relationships.

Using a combination of lectures and practicums, you will have an opportunity to build your foundation of knowledge in econometrics and apply the theory you learn with real life examples. By the end of the course, you should feel comfortable working with data, interpreting your results, and explaining your findings to others.

2.4 Learning Objectives

- Translate between plain English and statistical terms and concepts: identify key information regardless of wording and distinguish incorrect statements from correct ones
- Select and apply a suitable quantitative approach to a new situation while making your reasoning clear: this may require sentences, hypotheses, equations, calculations, fully labeled graphs, and/or diagrams
- Proficiently read output from various statistical software packages presented in the course (such as STATA or R)
- Use Excel and STATA to analyze data and replicate published results
- Correctly interpret quantitative results for a non-technical or technical audience
- Draw valid statistical conclusions and avoid common pitfalls
- Explain what would change if a researcher made different choices or the data changed
- Identify the underlying assumptions in quantitative analyses and figure out how violations affect conclusions and interpretations
- Read and critically evaluate analyses
- Effectively apply course concepts to a wide range of contexts from popular press articles to papers in peer-reviewed academic journals
- Assess available data or propose a data collection plan to address a research question
- Craft compelling, concise, precise, clear, and coherent written arguments

2.5 Quercus

Our course's Quercus site is available here. The Quercus site contains the syllabus, course calendar, lecture slides and other readings, useful resources, and important announcements. You are expected to check Quercus regularly.

2.6 Textbook and Slides

Recommended Textbooks: The recommended textbooks for this course are *Business Statistics, 4th Canadian Edition, by Sharpe, De Veaux, Velleman, and Wright* and *Introductory Econometrics, 6th Edition, by Wooldridge*. While the textbooks are not required, students have found them very useful in the past. Used textbooks, virtual copies, and the University of Toronto Libraries' copies may be available.

Readings for the course include the textbooks and supplements available on Quercus' **Readings** tab.

Slides: The instructors will provide slides in the course, which are mandatory reading materials. However, it is important you attend lectures, since many concepts on the slide deck will be explained in detail during class.

You will also need to download the DACM Handbook from the course website. This handbook was written by Professor Jennifer Murdock to accompany the DACM lecture content. There will be assigned readings ahead of each practicum.

2.7 Data Analysis Course Module (DACM) Practicums

There will be nine **required** DACM practicums. In these practicums, you will learn data analysis skills, reinforce your understanding of core course curriculum, and practice effective writing skills. Bring your laptop with an up-to-date installation of Microsoft 365 ProPlus (you will receive instructions for STATA later in the term). Also, bring pencils, erasers, your TCard, and the course aid sheets. Be prepared to actively work with others, do analyses, and write. Complete the assigned readings in the DACM Handbook ahead of time.

3 Assessments

3.1 Grade Breakdown

Note the dates provided in the table below are estimates and may be subject to change. The university is responsible for scheduling tests and exams during both the June and August exam periods.

Assessment	Weight	Instructor(s)	Date
Participation	10%	Alison & Tam	See section 3.2
Term Test 1	16%	Alison (& Samantha)	May 29
Term Test 2	16%	Alison (& Samantha)	June 18-24, TBD
Term Test 3	16%	Tam (& Samantha)	July 29
DACM	12%	Samantha	See section 3.4
Final Examination	30%	Alison & Tam & Samantha	August 15-22, TBD

3.2 Participation

Participation is worth 10% of your final grade. It will be assessed throughout the course based on your use of the course resources and engagement with the material. This includes making regular use of Quercus and Piazza, filling out course surveys, responding to in-class questions, and submitting two homework assignments (submitted through Quercus). We will discuss it further in class.

3.3 Tests

There will be three term tests in total:

- **Term Test 1 and Term Test 2 [16% each]:** Two-hour tests covering material from the first half [written by Alison but may include DACM material].
- **Term Test 3 [16%]:** A two-hour test covering material from the second half [written by Tam but may include DACM material].

The coverage and format for each term test and the final exam will be discussed in class and/or on Quercus in advance. An aid sheet (which has relevant formulas and statistical tables) will be provided for you during tests/exams. It is posted in advance on Quercus so you can practice with it. You are allowed a **non-programmable** calculator for tests/exams, no other aids are permitted. See section 4.3 for the policy on missing tests, section 4.4 for the automatic weight adjustment policy, and section 4.5 for the grade appeal process.

3.4 DACM

There will be **nine mandatory** DACM practicums throughout the summer term. DACM practicums will occur on May 11, May 22, June 3, June 12, July 3, July 10, July 17, July 31, and August 7. Note that the quality of your work counts! Your grade will not be determined by attendance but rather the effort and quality demonstrated within your submitted work. Each practicum counts for 2% of your final grade for a total of 12%. See section 4.3 for the policy on missing DACM practicums.

3.5 Final Exam

The final exam is a three-hour assessment during the university's final examination period (scheduled for August 15 - 22), which covers all materials in the course, including both halves and DACM. It will more heavily weight content from the second half after the third and final term test.

4 Other Important Things

4.1 Communication Policy

Questions about the course material can be asked during lecture time, student hours, or on Piazza. However, you may also email the instructors with your questions. Please note that Alison teaches during the first half of the course (May - June) and Tam teaches during the second (July - August), you should direct any questions to the relevant instructor for that part of the course. We will respond to emails during the half we are not teaching but note that we may be slower to respond then. Please include ECO220 in the email subject line.

4.1.1 Piazza

Piazza will be made available throughout the course. This is a forum for students to ask questions about the course material. We encourage students to try to answer questions, discuss the material, and share any helpful resources they may have - this also counts towards your participation grade! Piazza will be monitored by the instructors and TAs who will also answer questions. Note the course's Piazza has separate folders for the first and second halves as well as for DACM; it is important you post in the appropriate folder so the relevant instructors/TAs see it.

4.2 Student Hours

Each week, there will be at least two hours of student hours (also known as office hours) - one with the instructor and one with the TA. This is a great opportunity to ask us questions related to course materials.

4.3 Missing Assessments

Missed Test: If you miss a term test, you **must** fill out a missed test form within 72 hours of the assessment date (this will be available on Quercus). We will not accommodate more than one missed test in the course. If your situation is such that you are unable to complete more than one test, you should consult your College Registrar for advice on dropping the course and retaking it when you are in a better position to complete the required work.

- For Term Test 1 and Term Test 2, there will be a combined make-up test that will be administered after Term Test 2. The make-up test will cover material from both tests, not just the test you missed. There is no make-up for the make-up test, so if you miss it, you will be assigned a grade of zero.
- For Term Test 3, there is no make-up test. Instead, the weight of the test [16%] will be shifted to the final exam.

Missed DACM: The 3 lowest DACM practicums are automatically dropped from grade calculation. This is done automatically, and in particular, you do not need to submit any documentation if you miss a practicum. No further accommodations will be made for DACM.

Missed Final Exam: If you miss the final exam, you need to submit a petition to the Faculty of Arts and Science for a deferred final exam. Please consult this link for more information on the petition process.

4.4 Automatic Weight Adjustment

If you write three tests (of the three term tests and the make-up test), but perform worse on one than in the final exam, we will automatically lower the weight of your lowest test by 10 percentage points and increase the weight of the final exam by 10 percentage points. This means your lowest performing test will be worth 6% of your grade and your final exam will be worth 40%. This is only done if it helps your final grade. Any questions around your academic integrity for any work disqualify you from automatic adjusted weights.

4.5 Appealing Grades

After your tests are returned, you will have an opportunity to review them via Crowdmark. A form to appeal your grade will be made available one week after the return date and you will have one week to submit it. By submitting an appeal, you agree to having your entire test remarked. In particular, it is possible for your grade to increase OR decrease after the regrading process.

4.6 Cheating or Academic Dishonesty

Don't cheat or commit academic offenses; it's not worth it. If you cheat or commit an academic offense, we are obligated to report it to the relevant university authority, and it could negatively affect your academic record and will likely take many agonizing months to resolve. If you have questions or concerns about what constitutes appropriate academic behaviour, please reach out to us. Everything you need to know about academic integrity is right here.

4.7 Recording, Photography, and Sharing Course Material

In general, you shouldn't be recording the lecture unless you ask us for explicit consent to do so. Some students may need to record the lecture for accessibility reasons, and we are happy to accommodate, but you will have register for it (see below). Under no circumstances should you publish any of the course material online or distribute it to others outside of the class. This is an infringement of copyright.

4.8 Accessibility and Accommodations

Some students may require special accommodation on assessments for a wide range of reasons. We are very happy to provide those accommodations to you, but you will have to register for them formally. For example, you can click here to learn about religious accommodations or here to learn about accessibility services. From our understanding, it takes time for accommodations to be processed, so the sooner you submit the paperwork, the better. Even if you do not think you will need any accommodations, it is better to register and not use it than to need it and not have it! A disability can be physical, sensory, a learning disability, a mental health disorder, or a short-term disability like an injury. If you are not sure whether you have a disability, you can contact Accessibility Services (confidentially) with questions.

Everyone can benefit from the university's support services, and we encourage you to take advantage of the resources available to you. For a list of current programs and services, click here. If you are struggling with the course or expect to miss a significant portion of the classes and/or tests, we also encourage you to reach out to your College Registrar immediately. Note that missing one week of class is equivalent to missing **two weeks** of lectures in a regular term (since the summer course runs more than twice as fast). Hence, any significant absence could have an important impact on your chances at success in this course.

4.9 Equity Statement

The equity statement of our university can be found here. In short, it's everyone's responsibility to foster a positive, respectful, and welcoming environment for all. As the instructors, we will do our best to ensure our learning environment is inclusive so that all our students can feel safe and comfortable being a member of our class. We ask you to do your part in creating an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. Discrimination or harassment against any persons or communities will not be tolerated.

4.10 Land Acknowledgement

We would like to acknowledge the land on which the University of Toronto operates. For thounsands of years, people have lived on and cared for this land. This land is the territory of the Wendat and Petun First Nations, the Seneca, and the Mississaugas of the Credit River. The territory was the subject of the *Dish with One Spoon Wampum Belt Covenant*, an agreement between the Iroquois Confederacy and the Confederacy of the Ojibwe and allied nations to peaceably share and care for the resources around the Great Lakes. Today, this land is home to many Indigenous people from across Turtle Island as well as settlers from around the world.

We are grateful to have the opportunity to live and learn on this land and we understand we all have a role to play in the ongoing process of reconciliation. We invite you to reflect on your relationship to this land and the steps you can take towards reconciliation. The Final Report on the Steering Committee for the University of Toronto Response to the Truth and Reconciliation Commission of Canada and its derived Calls to Action can be found online at these links, as well as the University of Toronto Libraries' Research Guide on The Indigenous History of Tkaronto, which may be helpful resources for you to continue to learn, reflect, and take action.

5 Tentative Schedule for the Course

The following schedule is our plan for the summer; however we may adjust it throughout the course. You should check Quercus for the most up to date schedule and use this only as a guide.

- May 4 - Unit 1: Sampling, Data & Describing Categorical Variables
- May 6 - Unit 2: Histograms, Central Tendency, and Variability for Describing a Single Interval Variable
- May 8 - Unit 3: Percentiles, Box Plots, Grouped Data, Standardizing, and Other Transformations
- May 11 - DACM 1
- May 13 - Unit 4: Describing Associations, Covariance, Correlation, and Causality
- May 20 - Unit 5: Simple Regression: OLS, Interpretation, ANOVA, and R-squared
- May 22 - DACM 2
- May 25 - Unit 6: Logarithms in Regression Analysis and Dummy Variables
- May 27 - Overflow and review for TT1 (we will cover any content we didn't get to)
- May 29 - Term Test 1 (see section 3.3)
- June 1 - Unit 7: Randomness and Probability
- June 3 - DACM 3
- June 5 - Unit 8: Random Variables and Discrete Distributions
- June 8 - Unit 9: Continuous Distributions
- June 10 - Unit 10: Sampling Distributions, $\hat{p}$, $\bar{x}$, and Simulation

- June 12 - DACM 4
- June 15 - Unit 11: Confidence Interval Estimation: Single Proportion and Difference Between Proportions
- June 16 - Overflow and review for TT2
- June 18-24 - Term Test 2
- July 3 - DACM 5
- July 6 - Unit 12
- July 8 - Unit 13
- July 10 - DACM 6
- July 13 - Unit 14
- July 15 - Unit 15
- July 17 - DACM 7
- July 20 - Unit 16
- July 22 - Unit 17
- July 24 - Overflow and review for TT3
- July 29 - Term Test 3
- July 31 - DACM 8
- August 5 - Unit 18
- August 7 - DACM 9
- August 10 - Unit 19
- August 12 - Unit 20
- August 13 - Overflow and review for Final Exam
- August 15-22 - Final Exam

If there is anything else that you feel is missing from the syllabus or unclear, please email us and let us know!