UNIVERSITY OF TORONTO

ECO227Y1Y Foundations of Econometrics

2024-2025 Academic Year

Fall/Winter Sessions

Professor:	Kuan Xu	**Email:**	kuan.xu@utoronto.ca
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1. Key Course Information

Course Websites:

Quercus (https://q.utoronto.ca)

The platform posts the link to Cengage's WebAssign (textbook + exercises), syllabus, lecture slides and notes, announcements, test answer keys and grading rubric, grades, Zoom (for Instructor's online office hours), etc.

Crowdmark (https://app.crowdmark.com/sign-in/utoronto)

This platform posts the graded tests 1, 2, and 3 and feedback.

Lectures:

Wednesdays 3:00 pm – 5:00 pm, Fall and Winter Term Location: BL205

Tutorials:

Mondays 11:00 am – 1:00 pm, Fall and Winter Term Location: BL205

Office Hours:

Instructor's Office hours: Online on Thursdays, 3:30 pm – 4:30 pm, online via Zoom (link posted on Quercus); **In-person on** Wednesdays, 6:00 pm-7:00 pm (after the class), GE213

TA Office Hours: In-person on Mondays, 1:00 pm – 2:00 pm, Location: (Fall Term Location: TBA from Sept. 9 to Nov. 25, 2024; Winter Term Location: TBA from Jan. 13 to Mar. 31, 2025)

2. Course Delivery Method

Lectures and tutorials are in person.
Important note: Course materials are copyrighted. You are not allowed to republish or share lecture materials.

3. Course Description and Intended Learning Outcomes

This is a rigorous introductory course in probability and mathematical statistics intended for students in Economic Specialist programs. The course assumes basic familiarity with elementary calculus and will use it extensively. The course gives students a rigorous introduction to probability and estimation theory, sampling distributions, hypothesis testing, and multiple regression analysis. Students will learn the tools used in economics and finance to model and address randomness and uncertainty.

4. Textbook

WebAssign for Wackerly et al. (WMS), *Mathematical Statistics with Applications*, 7th edition (ISBN: 9781779541062) can be purchased via the link to Cengage Content in Quercus.

For those who would like a Print textbook + WebAssign, check with the University bookstore about the package (ISBN 978177954108).

The lectures in this course are based on WMS, and the weekly tutorial will cover additional materials and examples for the weekly lecture, application of R and other relevant software packages. In addition, the weekly tutorial will also cover some WebAssign questions.

5. Prerequisites and Co-requisites

Prerequisites: (ECO101H1(70%), ECO102H1(70%))/ ECO100Y5(70%)/ (ECO101H5(70%), ECO102H5(70%))/ (MGEA02H3(70%), MGEA06H3(70%)); MAT133Y1(63%)/ (MAT135H1(60%), MAT136H1(60%))/ MAT137Y1(55%)/ MAT157Y1(55%)

Corequisites: Recommended: MAT223H1/ MAT240H1, MAT235Y1/ MAT237Y1/ ECO210H1

Exclusions: STA237H1, STA238H1, STA247H1, STA248H1, STA255H1, STA257H1, STA261H1, ECO227Y5

6. Tentative Course Schedule, Topics, Readings, Exercises and Marking Scheme

	Week	Lecture Topic	Readings-WMS Chapters	WebAssign Exercise
		Fall 2023		
09-04	1	Introduction & Probability Theory I	1 & 2.1 – 2.12	Fall-Ex1
09-11	2	Probability Theory II	2.1 – 2.12	Fall-Ex2
09-18	3	Probability Theory III	2.1 – 2.12	Fall-Ex3
09-25	4	Discrete Random Variables I	3.1 – 3.9, 3.11	Fall-Ex4
10-02	5	Discrete Random Variables II	3.1 – 3.9, 3.11	Fall-Ex5
10-09	6	**In-Person Test #1 (20%)** in Classroom (Makeup 2024-11-08, 9 am-11am, location: TBA)		
10-16	7	Discrete Random Variables III	3.1 – 3.9, 3.11	Fall-Ex6
10-23	8	Discrete Random Variables IV	3.1 – 3.9, 3.11	Fall-Ex7
10-30	9	**Fall reading week (no class)**		
11-06	10	Continuous Random Variable I	4.1 – 4.10	Fall-Ex8
11-13	11	Continuous Random Variable II	4.1 – 4.10	Fall-Ex9
11-20	12	Continuous Random Variable III and Multivariate Probability Distribution I	4.1 – 4.10, 5.1 – 5.8	Fall-Ex10
11-27	13	**In-Person Test #2 (20%)** in Classroom (Makeup 2025-01-17, 9am-11am, location: TBA)		
		Winter 2024		
01-08	1	Multivariate Probability Distribution II and Functions of Random Variable I	5.1 - 5.8, 5.10-5.11, 6.1 – 6.5, 6.7	Winter-Ex1
01-15	2	Functions of Random Variables II	6.1 – 6.5, 6.7	Winter-Ex2
01-22	3	Sampling Distribution and Central Limit Theorem	7.1 – 7.3, 7.5	Winter-Ex3
01-29	4	Estimation I	8.1 – 8.9	Winter-Ex4
02-05	5	Estimation II	8.1 – 8.9	Winter-Ex5
02-12	6	**In-Person Test #3 (20%)** in Classroom (Makeup 2024-03-07, 9am-11am, location: TBA)		
02-19	7	**Winder reading week (no class)**		

	Week	Lecture Topic	Readings-WMS Chapters	WebAssign Exercise
02-26	8	Point Estimators I	9.1 – 9.7	Winter-Ex6
03-05	9	Point Estimators II	9.1 – 9.7	Winter-Ex7
03-12	10	Hypothesis Testing I	10.1 – 10.9	Winter-Ex8
03-19	11	Hypothesis Testing II	10.1 – 10.9	Winter-Ex9
03-26	12	Regression I	11.1 – 11.7	Winter-Ex10
04-02	13	Regression II and Review	11.1 – 11.7	
During Final Exam Period, the date and location: TBA	-	**In-Person Test #4 – Final Exam (40%) (Makeup Final Exam, Time and Location, TBA)**		

7. Readings, Problem Sets, and Tutorials

Required readings for each module are available in section 6. It is recommended that the students complete the required readings before attending weekly lectures.

Each Friday, a weekly WebAssign problem set (Fall-Ex# or Winter-Ex#) will be posted on Quercus and will be due in 7 days. The resulting total score (100%) from these problem sets will be translated into 10% bonus points towards the final grade of the course.

Each Monday, TAs will provide discussion-based tutorials, and all students are expected to attend. These tutorials will discuss key concepts and selected questions related to lectures, the use of R and other relevant software packages, sample test answer keys, and test answer keys. TA also offers in-person office hours each Monday immediately after the weekly tutorial.

8. Course Policies

8.1 Policies on Missed Tests

A grade of zero will be given to students who do not write the test unless an email notice is sent to the instructor *on the day of the test (no later than midnight)* with appropriate documentation, *submitted within two weeks after the test (no later than midnight),* for missing the test.

- Make-up tests will only be scheduled for those who sent the notice and appropriate documentation.

- An email notice must be sent to the instructor kuan.xu@utoronto.ca *on the day of the test (no later than midnight).*
- The following are recognized forms of documentation:

  a. Absence Declaration via ACORN
  b. The University of Toronto Verification of Illness or Injury Form (VOI)
  c. College Registrar's letter
  d. Letter of Academic Accommodation from Accessibility Services

- It is by the University policy that there are no "make-up exams" for "make-up exams."

Regarding the Absence Declaration, students who are absent from academic participation (see below for important information on eligibility) and who require consideration for missed academic work may report their absence using the **ACORN** Absence Declaration Tool. **One absence declaration per academic term is allowed.** Students should also advise their instructor of their absence as required. For more information on the Absence Declaration, see https://www.artsci.utoronto.ca/current/academics/student-absences

The ACORN Absence Declaration Tool is intended to be used in the following circumstances:

- A health condition or injury (e.g., illness, serious physical harm, mental health issue, scheduled surgery)
- A personal or family emergency (e.g., unanticipated and unavoidable familial incident beyond the student's control)
- Bereavement (e.g., the death of a student's immediate family member or close friend)

The ACORN Absence Declaration Tool is not intended to be used in the following circumstances:

- Personal social obligations
- Travel not related to your academic program
- Technological issues
- The avoidance of deadlines or tests

The deadlines of WebAssign problem sets are firm. Students should start working on them as early as they are released. An extension may be given to WebAssign problem sets under the same conditions for granting make-up tests.

8.2 Communication

The instructor will reply to emails within 48 hours, except on weekends and holidays, with the following provisions:

- The question should require no more a few sentences in response. If it takes more, office hours are the more appropriate venue.
- It is also (strongly) preferable that you use the University of Toronto email addresses: The instructor's spam filter is set to maximum.
- Always identify yourself, UTORid, and the course code in your email heading.
- The teaching assistants have the same email policy as they have one hour each per week to reply to course-related email messages.
- Students have two weeks to send their regrading requests to kuan.xu@utoronto.ca when their tests are returned. Regrading requests must be written clearly with reference to the corresponding grading rubric.

8.3 Academic Misconduct

Students should note that copying, plagiarizing, or other forms of academic misconduct will not be tolerated. Any student caught engaging in such activities for graded work (e.g., all tests) will be subject to academic discipline ranging from a mark of zero to dismissal from the University as outlined in the academic handbook. Any student abetting or otherwise assisting in such misconduct will also be subject to academic penalties.

8.4 Accommodations

The University is committed to accessibility. If a student has a consideration that may require accommodations, please contact Accessibility Services: https://www.studentlife.utoronto.ca/as, 416-978-8060 or accessibility.services@utoronto.ca

8.5 Equity, Diversity, and Inclusion

The University of Toronto is committed to equity, human rights, and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. The University of Toronto does not condone discrimination or harassment against any persons or communities.