# MATH-1550H-R: Introduction to Probability
# 2025WI - Peterborough Campus

## Instructor:

Instructor: Aras Erzurumluoglu

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Phone Number: 705-748-1011 x7926

Office: ENW 341

Office Hours: Tuesday 13:00-13:50 and Thursday 11:00-11:50

## Meeting Times:

Lectures:

MON 14:00 - 15:50 in-person at SC 137
TUE 12:00 - 12:50 remote synchronous only, on Zoom (link will be shared on Blackboard)

Seminars:

There are multiple sections that meet at different times. Please refer to the academic timetable on myTrent for information on the section that you are registered to.

Also, please refer to the academic timetable for up-to-date scheduling information, as these times and locations may change.

## Co-instructors and Teaching Assistants:

Information not currently available.

## Department:

Academic Administrative Assistant: Colleen Berrigan

Email Address: math@trentu.ca

Phone Number: 7715

Office: SC327

## Description:

Probability, random variables, probability distributions.

## Learning Outcomes:

Upon successful completion of this course, a student should be able to:

1. Develop counting techniques used to calculate discrete probabilities.
2. Define and recognize sample spaces, continuous and discrete random variables and events.
3. Understand rules of probability.
4. Calculate probabilities and conditional probabilities of events.
5. Use (joint) probability distribution and density functions (including some special distributions and densities) to calculate probabilities.
6. Approximate probabilities in certain situations; use binomial distribution to approximate normal distribution.
7. Find expected values and moments of random variables, including joint random variables.
8. Identify applications to real life situations; e.g. games of chance, quality control, decision making.

## Texts:

No textbook required. Lecture notes will be posted on Blackboard.

## Readings:

For additional reading, Grinstead and Snell's "Introduction to Probability" may be accessed for **free** at http://euclid.trentu.ca/math/sb/1550H/Winter-2018/Introduction_to_Probability.pdf

## Assessments, Assignments and Tests:

- 8 Mini-Assignments / quizzes: each for 3% - collectively for 24% of final grade
  - Dates: Posted on Monday and due Friday evening of the same week.
  - #1 due Jan. 17,
  - #2 due Jan. 24,
  - #3 due Feb. 7,
  - #4 due Feb. 14,
  - #5 due Feb. 28,

    - #6 due March 14,
    - #7 due March 21, and
    - #8 due April 4
- 3 Tests: In-person, #1 is for 14%, #2 is for 14%, #3 is for 10% - collectively for 38% of final grade
    - Dates: Monday (in class) at 2:00 PM.
    - #1 on Jan. 27,
    - # 2 on March 3, and
    - # 3 on March 24
- Final Exam: 2.5-hour in-person exam, worth 38% of final grade
    - Scheduled by the university during the final exam period April 7-23.

**If you miss a mini-assignment / quiz or a test due to a valid reason, you should communicate with me by email within a week after the mini-assignment / quiz deadline or test date to seek alternative arrangements for your grade. Otherwise, you will receive a grade of 0 on that mini-assignment / quiz or test.**

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## Grading:

- 8 Mini-Assignments / quizzes: equally weighted (3% each) - collectively for 24% of overall grade
    - Mini-Assignments: #1 due Jan. 17, #2 due Jan. 24, #3 due Feb. 7, #4 due Feb. 14, #5 due Feb. 28, #6 due March 14, #7 due March 21, and #8 due April 4
- 3 Tests: #1 is for 14%, #2 is for 14%, #3 is for 10% - collectively for 38% of overall grade
    - Dates: Monday (in class) at 2:00 PM. #1 on Jan. 27, # 2 on March 3, and # 3 on March 24
- Final exam: 38% of overall grade

Total: 24% + 38% + 38% = 100%

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## Grade Total by Withdrawal Date:

At least 25% of the overall grade will be made available by March 7th (final day for withdrawal).

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## Schedule:

Below is a tentative schedule of topics. This schedule is subject to change as needed and should be used as rough guideline.

**Please see "Grading" for the dates of tests and due dates of mini-assignments / quizzes**

- Week 1: Counting techniques
- Week 2: Counting techniques
- Week 3: Sample spaces, events, probability

- Week 4: Independent events, Bayes' Theorem
- Week 5: Probability distributions/densities
- Week 6: Joint distributions densities
- Reading Week: Feb 17-21 - no lectures
- Week 7: Expected value
- Week 8: Expected value
- Week 9: Moments
- Week 10: Special probability distributions
- Week 11: Special probability densities
- Week 12: Functions of random variables

## Course Guidelines:

Students are expected to attend all lectures and seminars that they are registered in. It is the responsibility of the student to get caught up on any missed content. There will be no late/early writing of tests, or make up tests.

Please see https://www.trentu.ca/registrar/welcome/important-dates-deadlines for other important dates.

Tips on how to succeed in this course:

- Ask questions.

- Make use of the office hours. Office hours are for you, and you should take advantage of them.

- Practice. This course is best learned by taking some time to understand the theory and then solving many examples. A huge mistake that many students do is when they assume that they know how to solve a problem and then leave it there. If you don't solve many problems you will not know what kind of issues may arise when attempting a given problem.

- Do not wait until the last minute if things are not going very well.

## University Policies:

### Academic Integrity

Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offence and carries penalties varying from failure on an assignment to expulsion from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's *Academic Integrity Policy*. You have a responsibility to educate yourself – unfamiliarity with the policy is not an excuse. You are strongly encouraged to visit Trent's Academic Integrity website to learn more: www.trentu.ca/academicintegrity.

### Access to Instruction

It is Trent University's intent to create an inclusive learning environment. If a student has a disability and documentation from a regulated health care practitioner and feels that they may need accommodations to succeed in a course, the student should contact the Student Accessibility Services Office (SAS) at the respective campus as soon as possible.

## Sharing and Distribution of Course Content

Students in this class should be aware that classroom activities (lecture, seminars, labs, etc.) may be recorded for teaching and learning purposes. Any students with concerns about being recorded in a classroom context should speak with their professor. If a student shares or distributes course content in any way that breaches copyright legislation, privacy legislation, and/or this policy, the student will be subject to disciplinary actions under the relevant Academic Integrity Policy, the Charter of Student Rights & Responsibilities, or the Policy on the Protection of Personal Information, at a minimum, and may be subject to legal consequences that are outside of the responsibility of the university.

## Student Absenteeism, Missed Tests and Examinations

Students are responsible for completing all course requirements, including attending classes and meeting assignment deadlines as specified on their syllabus.

Adjustments and deferrals to dates for participation, assignment submissions, tests, midterms and final examinations are not automatic. It is the student’s responsibility to email their instructor immediately if they are unable to fulfill academic requirements.

Courses delivered remotely may involve student participation in scheduled (synchronous) classes via web-based platforms, such as Zoom. Students unable to participate (i.e., by video and/or audio) should email their instructors to request alternative arrangements for participation in these scheduled (synchronous) classes.

Students are required to be available for all tests, midterms and exams that are listed in their course syllabus and scheduled by their instructor or the Office of the Registrar. Depending on their program, the instructor or the chair/director may decide on alternative arrangements for exams and tests. Normally a doctor’s note or supporting documentation is not required; however, when a student’s success in the course or program is in jeopardy as determined by the instructor or chair/director, documentation may be requested.

Specific SAS accommodations can be implemented for students registered with Student Accessibility Services (SAS), but it is the responsibility of the student to make these arrangements in advance as per SAS guidelines, and to discuss accommodations of due dates with their instructors.

Students can notify the Office of the Registrar of their wish to observe cultural or religious holidays during scheduled examination periods by the deadline set in the Academic Calendar. Personal travel plans are not acceptable reasons for missing tests or exams.

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