

**Faculty of Science Course Syllabus (Section A)** (revised April 2022)

**Department of Mathematics and Statistics**
*Stat 2060*
**Introduction to Probability and Statistics I**
*Winter 2023*

*Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.*

*We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities who have been here for over 400 years.*

**Instructor(s):** Dr. Ammar Sarhan      *ammar.sarhan@dal.ca*      *Office hours: TBA*

**Lectures:**      MTR 1635-1725 DUNN 117

**Tutorials:**      10 2hrs each

**Tutorial Tas and CAPA assistant information:**

Tutorial	M	W	Time	First name	Last name	email
T01		W	0835-1025	Quang Hai Son	Luu	lz375984@dal.ca
T02	M		1235-1425	Shuangming	Yang	sh875192@dal.ca
T03	M		0935-1125	Quang Hai Son	Luu	lz375984@dal.ca
T04	M		1735-1925	Claire	Cui	xt326277@dal.ca
T05		W	1435-1625	Quang Hai Son	Luu	lz375984@dal.ca
CAPA				Shanglun	Li	sh519468@dal.ca

**Course delivery:** The course is mainly in-person. However, I may switch to online delivery after the winter break. For the online delivery, all lectures will be recorded and will be available on the Brightspace.

**Course Description**

Rigorous introduction to probability and statistical theory. Topics covered include elementary probability, random variables, distributions, estimation and hypothesis testing.

**Course Prerequisites**

MATH 1000

**Learning Objectives**

Generally, students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.

At the end of this course, students should be able to:

1. Demonstrate an understanding of the basic concepts of probability and random variables
2. Understand the concept of the sampling distribution of a statistic, and in particular describe the behaviour of the sample mean
3. Identify the foundations for classical inference involving confidence intervals and hypothesis testing.

- Identify the foundations for classical inference involving confidence intervals and hypothesis testing.

### Course Materials

- Textbook: Probability and Statistics for Engineering and the Sciences, 9th edition, by J. Devore. [Any old edition will work]
- A scientific calculator with natural log and exponential functions.
- Course website: Brightspace (course materials) and LON-CAPA (homework)

### How to Login to LON-CAPA:

- In your web browser, go to <http://capa.mathstat.dal.ca>.
- You will be prompted to enter a username and password. By default, your username is your Dalhousie NetID and your password is your banner number (your Dalhousie student number that starts with B00). Your full banner number must be entered, that is: the upper-case letter B, followed by two zeros, then followed by 6 digits.
- You then have to select a role for the course you wish to enter. Most likely, you will have only one choice: a student user role for the course titled "Stat 2060". Click on the Select button next to that choice.
- You will be directed to the home page of the course. Navigation is easiest by using the tabs in the top blue bar. The Contents tab is where the assignments will be posted.
- For increased security and convenience, you should change the default password to the one you use for all other Dalhousie-related activities. Click on the Main Menu tab in the top blue bar, then click on Set my user preferences and then click on Password. Enter the current (default) password and enter (twice) your new password.
- For technical support, please contact the CAPA assistant.*

### For online/blended course delivery:

- *The midterm and final exam will be in-person and require on-campus attendance.*
- *If I switch to online delivery, all lectures will be delivered synchronously and recorded as well.*
- *For online delivery, students will need a laptop or Ipad or a surface tablet.*

### Course Assessment

#### Assignments: 15% (Online on CAPA)

Assignment	Due date	Assignment	Due date
1	Jan 29	6	March 12
2	Feb 5	7	March 19
3	Feb 12	8	March 26
4	Feb 19	9	April 6
5	March 5		

#### Tutorial Quizzes: 10% (in-person during the tutorials, require on-campus attendance)

Quiz	Due date	Assignment	Due date
1	Jan 23-27	6	March 6-10
2	Jan 30 - Feb 3	7	March 13-17
3	Feb 6 - 10	8	March 20-24
4	Feb 13-17	9	April 27-31
5	Feb 27 – March 3		

**Exams:** There will be a total of 2 exams: 1 midterm (25%) and 1 final exam (50%). The exams will be closed book with one page (double sided) of notes allowed. The schedules for the exams are:

**Midterm (25%):** Monday, Feb 27<sup>th</sup> from 7:00-9:00 pm

**Final exam (50%):** it is 3 hours exam (*Scheduled during exam period*).

**Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale**

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

### **Course Policies on Missed or Late Academic Requirements**

- *Each assignment will be available for an entire week. Therefore, students can have access to it for during that week and I will not accept any late assignment. In the case if a student is sick during that week, they MUST contact me before the closing date and I will give a day or two extensions, depending on the situation.*
- *Quizzes will take place during the tutorials and if a student misses it due to illness, they can write a makeup quiz.*
- *Students can NOT use the Student Declaration of Absence form for this course.*
- *Make-up exams can only be arranged in exceptional circumstances such as illness (with medical certificate). In such circumstances, the student must inform the instructor as soon as possible and provide proof before the exam's time.*

### **Course Policies related to Academic Integrity**

*I encourage students to work together on the assignments but not to copy the solutions from each other. I will not use any plagiarism software in this course.*

### **Course Content**

1. Descriptive statistics
2. Probability
3. Discrete random variables and distributions
4. Continuous random variables and distributions
5. Joint probability distributions
6. Point estimation
7. Confidence intervals based on a single sample
8. Hypothesis tests based on a single sample
9. Inference based on two samples

## University Policies and Statements

**This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate**

### Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

**Information:** [https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

### Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

**Information:** [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html)

### Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

**Code:** [https://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

### Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

**Statement:** <http://www.dal.ca/cultureofrespect.html>

### Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) ([elders@dal.ca](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Important Dates** in the Academic Year (including add/drop dates)

[https://www.dal.ca/academics/important\\_dates.html](https://www.dal.ca/academics/important_dates.html)

**University Grading Practices**

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

## Student Resources and Support

### Advising

**General Advising** [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)

**Science Program Advisors:** <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

**Indigenous Student Centre:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Students Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](https://www.dal.ca/campus_life/international-centre/current-students.html)

### **Academic supports**

**Library:** <https://libraries.dal.ca/>

**Writing Centre:** [https://www.dal.ca/campus\\_life/academic-support/writing-and-study-skills.html](https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html)

**Studying for Success:** [https://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)

**Copyright Office:** <https://libraries.dal.ca/services/copyright-office.html>

**Fair Dealing Guidelines** <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

### **Other supports and services**

**Student Health & Wellness Centre:** [https://www.dal.ca/campus\\_life/health-and-wellness/services-support/student-health-and-wellness.html](https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html)

**Student Advocacy:** <https://dsu.ca/dsas>

**Ombudsperson:** [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)

### **Safety**

**Biosafety:** <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

**Chemical Safety:** <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

**Radiation Safety:** <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

**Scent-Free Program:** <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

**Dalhousie COVID-19 information and updates:** <https://www.dal.ca/covid-19-information-and-updates.html>