Carleton University
School of Mathematics and Statistics
STAT 3502 A – *Probability and statistics* – Summer 2019

Instructor: Ahmed Almaskut

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Lectures: Tuesdays and Thursdays from 6:35 pm – 7:55 pm in Azrieli Theatre 301

Tutorials: Thursdays from 5:35 pm – 6:25 pm.

Section	Room	TA's name	TA's email
A1	Southam Hall 402	Alia Alkhathami	AliaAlkhathami@cmail.carleton.ca
A2	Southam Hall 404	Seema Zubair	seemazubair@cmail.carleton.ca
A3	Southam Hall 406	Keely Gibb	keelygibb@cmail.carleton.ca
A4	Southam Hall 516	Saad Hasan	saadhasan3@cmail.carleton.ca

Office Hours: Tuesdays 5:00 pm – 6:00 pm in 4348HP.

TA Office Hours: Wednesdays 12pm - 1pm, and Thursdays from 4:25pm to 5:25pm. All in 3422HP.

Textbook:

- *Probability and Statistics for Engineering and the Sciences , 9th edition. By Jay L. Devore*.

- *Student Solutions Manual (SSM), by Mathew A. Carleton.*

Marking Scheme:
Attendance	3%
Assignments	22%
Midterm	25%
Final Exam	50%

Prerequisite: MATH 2004 and enrolment in the Faculty of Engineering or B.Sc. programs of the Department of Physics [except Double Honours Mathematics and Physics].

Summer Break: June 19 – July 1.

Final Examination: August 17 – August 23.

TENTATIVE LECTURE SCHEDULE

WEEK	SECTIONS	TOPICS
1	2.1 – 2.4	Random experiment, sample space, events, axioms of probability, rules of probability, counting methods, conditional probability
2	2.5	Conditional probability cont. and independence; Bayes theorem.
3	3.1 – 3.3	Random variables and discrete probability distributions; probability (mass) function; distribution function; expected values and variances of discrete random variables; rules of expected values and variances.
4	3.4 – 3.6	Special discrete distributions: binomial, hypergeometric, geometric, negative binomial, Poisson. Poisson process.
5	4.1 – 4.3	Continuous random variables and their probability distributions; probability density function; distribution function; expected values and variances of continuous random variables, normal distribution; normal approximation to discrete distributions.
6	4.4	Gamma distribution; exponential distribution and its relationship with Poisson distribution.
7	5.1–5.2	Joint distributions; independent random variables; expected values, covariance, and correlation.
8	5.3 – 5.5	Sums of random variables; Central Limit Theorem; statistics and their sampling distributions; distribution of the sample mean; distribution of a linear combination.
9	6.1 – 6.2	Point estimation: definition of a point estimator, desirable properties of a point estimator (unbiasedness, minimum variance, consistency), methods of point estimation.
10	7.1 – 7.4	Interval estimation: definition of a confidence interval, interpreting confidence interval, large-sample confidence intervals, t distribution, small-sample estimation, confidence intervals for the mean of a normal distribution, chi-square distribution, confidence intervals for the variance of a normal distribution.
11	8.1, 8.4	Statistical hypothesis; null and alternative hypotheses; critical and acceptance regions; test procedure; type I error; type II error; level of significance; p-value; power of a test; power function of a test.
12	8.2, 8.3, 9.1, 9.2	Tests about population mean; tests for population proportion; two sample tests about population mean. Z-tests and t-tests.

Please note that this outline is subject to change depending on the progress of the course. All necessary changes will be announced in class and on cuLearn. It is the responsibility of the student to keep up to date with any such modifications.

Notes:

- **Withdrawal:** The last day for academic withdrawal from the course is **August 14, 2019**.

- **Tutorial :** Tutorials will start the week of **May 13, 2019**. You are required to attend all tutorials. TAs will be present to solve some selected problems and to answer questions.

- **Assignment :** There will be 4 assignments with specific due dates that will be posted on cuLearn. It is your responsibility to submit your assignment to the TA in your tutorial session. Only hard copies of the assignments will be accepted. No electronic submission such as e-mail submission will be accepted.

- **Midterm**: The midterm will be a 90-minute closed-book exam on **Friday, June 14th, from 6:30pm to 8:00pm**. **There will be no makeup, early, or delayed Midterm**; exceptions will be made in accordance with the university academic accommodation policies (see below). If you miss the midterm you will receive a zero, unless you provide your instructor with a proper documented reason (e.g., medical) within one week, in which case the weight of the midterm test will be shifted to the final exam. The same rule applies to each assignment. It is your responsibility to pick up your assignments/midterm in the following tutorial hours or class. After that, TAs and I are not responsible for missing assignment and midterm paper. It is your responsibility to make sure that your midterm/assignments marks recorded correctly on cuLearn. Deadline to make any corrections on your midterm/assignments marks is within one week of when you receive them. Students must bring their student card to the midterm and place it on the desk where it is visible.

- **Final Exam:** The final exam will be 3-hours, closed book exam based on all the material covered during the term. It is the responsibility of each student to be available at the time of the examination. In particular, no travel plans during the examination period in August, 2019 should be made until the examination schedule is released. Any student wishing to review their final examination paper must make an appointment within a three week period following the submission of the final grades.

- **Homework:** Selected exercises, mainly from the text, will be posted on cuLearn. These exercises are not to be handed in and will not be graded. However, to succeed in the course it is **ABSOLUTELY ESSENTIAL** that you do the exercises on a regular basis.

- **Calculators**: Only non-programmable calculators are allowed for tests and the final exam. I reserve the right to confiscate any calculator during the midterm or final exam.

- **Course Information:** It is your responsibility to keep up with information announced in class, on cuLearn, or sent to your Carleton e-mail account.

- **E-mail:** According to Carleton University policy under the Freedom of Information of Privacy Act (FIPPA), please use your Carleton account for all course related emails.

- **Attendance:** Attendance is mandatory. In order to get the 3% allotted to attendance, you will need to attend at least 90% of classes and tutorials

Requests for Academic Accommodation
You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation
Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation
Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities
If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

Survivors of Sexual Violence
As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Accommodation for Student Activities
Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf