

## STAT 3509

**Term:** Winter 2020  
**Instructor:** Professor B. Szyszkowicz  
**Email:** bszyszko@math.carleton.ca  
**Office:** HP 5249                      **Phone:** 520-2600 ext. 2140  
**Lectures:** Monday, Wednesday 1:05 – 2:25, SA 417  
**Tutorials:** Monday 2:35 – 3:25, SA 417  
**Grades:** Tutorials: 40% (Test 1: 20% , Test 2: 20%), Final Exam: 60%  
**Text:** *Introduction to Mathematical Statistics*, 8<sup>th</sup> ed., Hogg, McKean, Craig

### Course Outline

- Week 1 - 4      POINT ESTIMATION. INTERVAL ESTIMATION  
Linear combinations of Random Variables. Sample Statistics. Student's Theorem. Method of moments. Maximum Likelihood Estimators. Properties of estimators: Unbiasedness, consistency, efficiency. Fisher information. Rao-Cramer Lower Band. Confidence intervals.  
Sections: 2.8, 3.6.3, 4.1, 6.1, 6.2, 4.2, 4.2.1, 4.2.2.
- Week 5 – 8      MORE ON POINT ESTIMATION  
Measures of quality of estimators. Sufficient statistics. Completeness and Uniqueness. The exponential class of distributions. Sections: 7.2 – 7.5.
- Week 9 – 12      TESTING OF HYPOTHESES  
Introduction to Hypothesis Testing. Chi-Square Test. Optimal Tests of Hypotheses: Most Powerful Tests. Neyman-Pearson Theorem. UMP Tests.  
Sections: 4.5 – 4.7, 8.1 – 8.2.

Note: The above is an approximate outline only. You are responsible for making sure that you keep up with what is being done in class and with any changes announced in class.

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Students wishing to see their examination papers must make an appointment within three weeks of the examination to do this.

If there is any student in this course who, because of a disability, may have need for special accommodations, please come and discuss this with me. Students must also contact the Paul Menton Centre to obtain a Letter of Accommodation for such an arrangement.

## **STAT 3509 Tutorials**

Monday, 2:35 – 3:25

You will be given assignments on a regular basis (posted on CuLearn). They will include the description of the material from the textbook that you should study in addition to the lecture notes (please note that we will cover most of the material from sections indicated in the Outline of the course from our textbook but not all of it). Each assignment will also include the set of problems to solve. They will be discussed during tutorials. Try to solve as many problems as you can before tutorials.

During tutorials there will be two (closed book) tests (50 min each):

February 10: Test 1 (20%) will be based on Assignments 1-4

March 16: Test 2 (20%) will be based on Assignments 5-7

You have to write all tests, i.e. you will get 40% of the Final Mark from tests. In case of sickness (or other unfortunate events), please notify me (by e-mail) as soon as possible.

Doctor's certificate will be needed in order to make special arrangements.