STAT 3509 Winter 2021

Instructor: **Professor B. Szyszkowicz**
Email: bszyszko@math.carleton.ca
Text: *Introduction to Mathematical Statistics*, 8th ed., Hogg, McKean & Craig

NOTE: The whole course will be delivered online using cuLearn
Lectures: Lectures will be posted regularly on cuLearn (on Mondays)
Tutorials: Wednesday, 4:35 – 5:25 (online)
Grades: Assignments (50%), Two Midterms (20%), Final (30%)
Midterms: February 24 & March 17 (online during Tutorial).

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. Optimal Tests of Hypotheses: Most Powerful Tests. Neyman-Pearson Theorem. UMP Tests. Chi-Square Test
Sections: 4.5 – 4.6, 8.1 – 8.2, 4.7.

NOTE: The above is a very approximate outline only. Students are responsible for checking **cuLearn** regularly, where all course material will be posted. Homeworks will be given on a regular basis which will include the description of the material from the textbook that should be studied in addition to lecture notes (posted on **cuLearn**). Short Assignments will be given on a regular basis which should be submitted electronically by a given deadline. All detailed information will be posted on **cuLearn**.

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If there is any student in this course who, because of a disability, may have need for specialaccommodations, 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.