

Instructor: Professor B. Szyszkowicz
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Office: HP 5249 **Phone:** 520-2600 ext. 2140
Lectures: Wednesday, Friday 11:35 – 12:55, UC 280
Tutorials: Friday 1:35 – 2:25
Grades: Tutorials: 50% (Assignments: 20%, Test 1: 15%, Test 2: 15%),
Final Exam: 50%
Text: *Introduction to Mathematical Statistics*, 8th ed.,
by Hogg, McKean & Craig

Course Outline:

- Week 1, 2, 3** **Ch. 1:** *Probability and Distributions.*
Axioms of probability, Conditional probability, Independence of events. Random variables and their distributions. Transformations of a random variable. Expectation of a random variable. Variance. Moments. Moment generating function. Chebyshev's Inequality.
- Week 4, 5, 6** **Ch 2:** *Multivariate Distributions.*
Distributions of two random variables. Expectation. Transformations of random variables: distribution functions technique, change-of-variable technique. Conditional distributions and expectations. Independent random variables. Correlation. Linear combinations of random variables.
- Week 7, 8, 9** **Ch. 3:** *Some Special Distributions.*
Binomial and other related distributions. Poisson distribution, Poisson process. Gamma and Chi-square (χ^2) distributions. Normal distribution. Deriving distributions of linear functions of random variables: moment-generating-function technique. Deriving Beta, t , and F distributions. Sample mean and sample variance and their distributions. Student's Theorem.
- Week 10,11,12** **Ch. 5:** *Limiting Distributions.*
Modes of convergence of a sequence of random variables. Law of large numbers. Limiting distributions. Techniques to derive the limiting distributions. Central Limit Theorem and some of its consequences.

NOTE: The above is a very approximate outline only. Students are responsible for making sure that they keep up with what is being done in class and with any changes announced in class/ Brightspace. Students are responsible for checking **Brightspace** regularly, where some course material will be posted (including homework and assignments). Homework will be given on a regular basis and will include the description of the material from the textbook that should be studied in addition to lecture notes. Assignments will need to be submitted by a given deadline. All detailed information will be posted on **Brightspace**.

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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.