Department of Mathematics & Statistics
Concordia University

> **STAT 450 (MAST 672/881F)**
> Mathematical Statistics
> *Fall 2016*

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Office Hours: Wednesdays, Thursdays 14:00–15:30, and by appointment.

Prerequisite: STAT 250; STAT 349 previously or concurrently.

Text: *Introduction to Mathematical Statistics*, 6th or 7th Edition, by R.V. Hogg and A.T. Craig, Prentice Hall Inc., N.Y., 1994.

Reference: (for problems, examples etc) *Statistical Inference* (2nd Edition), by G. Casella and R. L. Berger, Duxbury.

Final Grade: The final grade will be based on the higher of (a) or (b):
a) Homework 10%, midterm exam **(FRI., 21 OCT. , 2016)** 20% and final exam 70%
b) Final exam 100%

Note: - All assignments should be done **independently**.
- MAST 672/881 students will be given additional assignment/exam problems.

Topics:
1. Distribution of functions of several random variables (distribution function and change of variable techniques), sampling distribution of mean and variance of a sample from Normal (μ, σ^2) distribution: *Sec. 2.2, 2.7.*
2. Distribution of order statistics and sample quantiles: [**6th Edition:** *Sec. 5.2.1- 2*, **7th Edition:** *Sec. 4.4.1-2].*
3. Estimation: unbiasedness, Cramér-Rao lower bound and efficiency, method of moments and maximum likelihood estimation, consistency, limiting distributions [**6th Edition:** *Sec. 4.1, 6.1, 4.2, 4.3 – 4, 6.4*, **7th Edition:** *Sec. 4.1, 6.1, 5.1 – 5.3, 6.2, 6.6].*
4. Sufficiency, minimal sufficiency, completeness, UMVUE, Rao-Blackwell and Lehman-Scheffe theorems: *Sec. 7.2 - 7.8.*
5. Hypothesis testing [**6th Edition:** *Sec. 5.5, 6.3 6.5*, **7th Edition:** *Sec. 4.5, 6.3, 6.5].*
6. Bayesian inference [**6th Edition:** *Sec. 11.2.1 – 2*, **7th Edition:** *Sec. 11.2.1 - 4].*