Department of Mathematics & Statistics
Concordia University

> **STAT 450 (MAST 672/MAST 881Y)**
> Mathematical Statistics
> ***Fall 2014***

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Office Hours: Mondays, Wednesdays 15:00–16:30, 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) *An Introduction to Probability and Statistics* (1st or 2nd Edition), by V.K. Rohatgi and A.K. M.D. Ehsanes Saleh, John Wiley, N.Y.

Final Grade: The final grade will be based on the higher of (a) or (b):
a) Homework 10%, term exam **(FRI., 17 OCT. , 2014)** 20% and final exam 70%
b) Final exam 100%

Note:
- All assignments should be done **independently**.
- MAST 670/881I students will be given additional assignment/exam problems.

Topics:
1. Distribution of functions of several random variables (distribution function technique, change of variable technique), 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, consistency, limiting distributions, maximum likelihood estimation, Cramér-Rao lower bound and efficiency [**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. Bayesian inference [**6th Edition:** *Sec. 11.2.1 – 2*, **7th Edition:** *Sec. 11.2.1 - 4].*
6. Hypothesis testing [**6th Edition:** *Sec. 5.5, 6.3 6.5*, **7th Edition:** *Sec. 4.5, 6.3, 6.5].*