

**STAT 450 (MAST 672/881), Sec. C**  
Mathematical Statistics  
*Fall 2017*

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**Office Hours:** Tuesdays, Thursdays 13:00–14:30, 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., 20 OCT. , 2017**) 20% and final exam 70%  
b) Final exam 100%

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

**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 ( $\mu, \sigma^2$ ) 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*].

**Academic Integrity and the Academic Code of Conduct**

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: [concordia.ca/students/academic-integrity](http://concordia.ca/students/academic-integrity)." [*Undergraduate Calendar, Sec 17.10.2*]