STAT 3800: Mathematical Statistics, Winter 2019 (A01)

Tentative Course Outline

Course Details

Course Title & Number:	Mathematical Statistics (STAT 3800)
Credit Hours:	3
Class Times:	MWF 9:30 a.m. – 10:20 a.m.
Location for Lectures:	527 Buller
Lab Time:	Monday 2:30 - 3:45 p.m.
Lab Location:	315 Buller
Pre-Requisites:	Prerequisite: STAT 3400 or the former STAT 3500 (005.350) (C).
Course Description:	(Lab Required) Multivariate distributions and transformations, order statistics, sampling distributions, convergence, introduction to statistical inference. May not be held with the former STAT 3600.

Instructor Contact Information

Instructor:	Brad Johnson
Preferred From of Address:	I'll answer to just about anything.
Office:	375 Machray Hall
Office Hours & Availability:	Mon 11:00 - noon, Thu 10:45 – 11:45 a.m. or by appt.
Office Phone Number:	(204) 474-8162
E-mail:	brad_johnson@umanitoba.ca (**Note**: I will only respond to e-mail from UMNet ID's)
Contact:	I prefer contact by e-mail or in person contact.

Textbook, Readings, Materials

Textbook: *An Intermediate Course in Probability*. Allan Gut. Springer Texts in Statistics. Springer: New York (2003). [Available free as a SpringerLink e-Book through the library].

Other Resources: Not required.

Introduction to Mathematical Statistics. 6th Edition. Hogg, McKean and Craig. Pearson/Prentice Hall. 2005.

Introduction to Probability and Mathematical Statistics. 2nd Edition. Bain and Engelhardt. Duxbury/Thompson Learning. 1992.

Statistical Inference. Casella & Berger. Duxbury. 2002.

Readings: In order to prepare for class, I will normally ask you to read about the topics to be covered prior the lecture. I am not expecting you to learn the material on your own, only to familiarize yourself with the main ideas and vocabulary so that the lectures are easier to follow. Do not get bogged down in formulae or minute details. If you come across something that is confusing or troubling, don't despair. If your questions are not resolved during the lecture, please ask. As you work on the problem sets, it will be helpful to re-read the material on a more detailed level.

Topics

We will cover the first 6 chapters of the textbook.

- Multivariate Random Variables (transformations, sampling distributions, etc.)
- Conditioning (basically a review).
- Transforms (generating functions, moment generating functions, etc.)
- Order Statistics.
- The Multivariate Normal Distribution (definitions, distribution of quadratic forms, Cochran's Theorem, etc.).
- Convergence (in distribution, in probability, in r-mean, almost sure)
- Other topics as time permits.

Course Technology

Course web-page: Course materials will be made available through the University of Manitoba's UM Learn system (`umanitoba.ca/d2l`).

Other Technology: It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. Students should restrict their use of technology to those approved by the instructor and/or University of Manitoba Accessibility Services for educational purposes only. Electronic messaging, e-mail, social networking, gaming, etc. should be avoided during class time. Cell phones should be off. If a student is on call for emergencies, their cell phone should be on vibrate mode and the student should leave the classroom before using it.

Course Work, Examinations & Grading

Midterm Tests: There will be 2 tests scheduled during the Lab time (Mondays @ 2:30 p.m. - 3:45 p.m. in 315 Buller) worth 50% of your final grade (30% for better test, 20% for the other test). The tentative dates are **Monday February 4/2019** and **Monday March 11/2019**, but these are **subject to change**.

Note: There will not be any makeup (deferred) mid-term exams for this course. If you miss a mid-term exam, **have a valid excuse**, and **notify me within 48 hours of the scheduled exam**, your final exam will be re-weighted to account for an additional 25% of your final grade per test.

Assignments: There will be no *formal* assignments for this course. I will, periodically, distribute sets of problems for you to work on. The midterm tests and final examination will be based, in part, on these or similar problems. You are free (and encouraged) to work in groups on these but you must be able to complete the work individually on tests/examinations. Additional problems may be posted to the course web page

Lab: Once a week, starting January 14th, there will be a compulsory lab held in 315 Buller (2:30 – 3:45 p.m.). Generally, a teaching assistant will be solving selected problems (taken from the list of supplementary problems) and answering other questions that you might have. **There are two midterm tests during the Lab time.**

Grading Scheme:

Item	Percent	
2 Mid-term Tests	50%	(30% for better test, 20% for other)
Final Exam	50%	
Total	100%	

Voluntary Withdrawal: The voluntary withdrawal deadline is **March 20, 2019**.

Important Dates

These dates are tentative and subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to Section 2.8 of the ROASS Procedure.

Date	Information
Jan 7	Classes Begin
Feb 4	Midterm Test 1 (Tentative)
Mar 11	Midterm Test 2 (Tentative)
Mar 20	Last day for VW
Apr 9	Last Class

Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the Copyright Act applies or written permission has been confirmed. For more information, see the UniversityÕs Copyright Office website at `http://umanitoba.ca/copyright/` or contact `um_copyright@umanitoba.ca`.

Recording Class Lectures

Brad Johnson and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission of Brad Johnson. Course materials (both paper and digital) are for the participantÕs private study and research.

Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit: `umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2014_06_05.pdf`

Please note that all communication between myself and you as a student must comply with the electronic communication with student policy (`umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html`). You are required to obtain and use your U of M email account for all communication between yourself and the university.

Academic Integrity

It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences. Please familiarize yourself with the information contained in *Academic Calendar* > *General Academic Regulations*> *SECTION 8: Academic Integrity*. (see `http://umanitoba.ca/calendar`) The Faculty of Science home page at www.umanitoba.ca/science also contains links regarding academic and disciplinary matters.

ROASS Schedule A

Schedule "A" of the *Responsibilities of Academic Staff with regards to Students (ROASS)* policies of the University of Manitoba lists resources and policies for students. It is important that you familiarize yourself with these resources and policies. This document will be posted to the Department of Statistics web page under "Courses" and to the UM Learn system.