STAT 3800: Mathematical Statistics, FALL 2018 (A01)

Tentative Course Outline

Course Details

Course Title & Number:	Mathematical Statistics (STAT 3800)
Credit Hours:	3
Class Schedule:	9:30 AM–10:20 AM, Mondays/Wednesdays/Fridays
Location for Lectures:	124 Machray Hall
Location for Tutorials:	114 St. John's
Course Material:	All course materials are posted on UMLearn (D2L) web
Pre-Requisites:	STAT 3400 (or STAT 3500) (C)

Instructor Contact Information

Instructor:	Mohammad Jafari Jozani
Office:	365 Machray Hall
Office Hours & Availability:	Mondays/Wednesdays 13:00–14:00 or by appointment (call or email to confirm).
Office Phone Number:	204-272-1563
E-mail:	m_jafari_jozani@umanitoba.ca
	I will only respond to e-mail from UMNet ID's
	When feasible, I normally return a call or an email within 24 hours.

Tutorial

Instructor:	Han Yu
Office:	356 Machray Hall
Office Phone Number:	(204) 474-8930
E-mail:	rumyu7@myumanitoba.ca
Lab:	Mondays 2:30 PM–3:45 PM
	September 10th will be used for teaching and tutorials start on September 17th. Also, two midterm tests take place during the tutorials

Attendance of tutorials is not mandatory but strongly recommended. During the tutorials, the TA will solve some selected problems and answer your questions. If needed, a tutorial may be replaced by a lecture.

General Course Information and Course Registeration

(Lab Required) Multivariate distributions and transformations, order statistics, sampling distributions, convergence, introduction to statistical inference. Not to be held with the former STAT 3600 (005.360). It is **your responsibility** to ensure that you are entitled to be registered in this course. This means that you:

1. have the appropriate prerequisites, as noted in the calendar description, or have an appropriate permission from the instructor to waive these prerequisites;
2. have not previously taken, or are concurrently registered in, this course and another that has been identified as "not to be held with" in the course description.

The registration system may have allowed you to register in this course, but it is **your responsibility to check**. If you are not

entitled to be in this course, you will be withdrawn, or the course may not be used in your degree program. There will be no fee adjustment. This is not appealable. Please be sure to read the course description for this and every course for which you are registered.

Textbook, Readings, Materials

Textbook: I will have my own course notes and there is no required textbook for this course. However, I recommend to use the following textbooks for further reading and exercises. I will make lecture notes as well as some practice problems available through the UM Learn system (see below).

Other Resources:

1. *An Intermediate course in Probability*. Allan Gut. 2nd Edition. Springer Texts in Statistics: NewYork (2009). E-book is available through the University of Manitoba Libraries..
2. *Introduction to Mathematical Inference (Sixth Edition)*. R.V. Hogg, J.W. McKean and A.T. Craig. Pearson/Prentice Hall (2005). ISBN 0-13-008507-3.
3. *Statistical Inference (Second Edition)*. George Casella and Roger L. Berger. Duxbury Advanced Series. (2002). Chapters 1–5.

Readings: In order to prepare for class, I will normally ask you to read about the topics to be covered before 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 To Be Covered

This is a key course in statistics (and actuarial studies) and a pre-requisite for STAT 4100 (and other important senior statistics courses). The goal is to lay a solid foundation on some statistical and mathematical techniques that are of important for statistical inference. The emphasis is on developing useful techniques and skills of deriving important sampling distributions. This is a tentative list of topics to be covered (not necessarily in the following order):

- Multivariate distributions and transformations
- Conditioning, Transforms
- Order statistics
- Multivariate normal distribution
- Sampling distributions and Convergence

Course Technology

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

Software: Where applicable, we will be making use of the R statistical software. R is freely available for Linux, Macintosh and Windows from *The Comprehensive R Archive Network* at `http://cran.r-project.org/`. Please download and install.

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 turned off. If a student is on call for emergencies, his/her cell phone should be on vibrate mode and the student should leave the classroom before using it.

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
September 5, 2018	Classes Begin
October 15, 2018	**Midterm Test 1** (114 St. John's; Tentative time: 2:30–4:00 pm)
November 5, 2018	**Midterm Test 2** (114 St. John's; Tentative time: 2:30–4:00pm)
November 19, 2018	Last Day for VW
December 7, 2018	**End of Classes**

Course Work, Examinations & Grading

Midterm and Final Exams: There will be two mid-term exams, worth 50% of your final grade. The tentative dates are October 15th and November 5th, 2018 from 2:30 pm to 4:00 pm. Tentative location for the exams is 114 St. John's but this might be **subject to change**. The midterm tests and the final examination are closed book. No formula sheet will be provided. A non-programmable calculator might be necessary (graphing calculators are not permitted). However, other electronic devices, such as cell phones and MP3, are strictly prohibited.

Item	Percent
Mid-term Test 1	25%
Mid-term Test 2	25%
Final Exam	50%
Total	100%

Note: There will not be any makeup (deferred) mid-term exams for this course. If you miss any of the mid-term exams, you will be assigned a mark of zero for the test, unless you **have a valid excuse**, and you **notify me within 48 hours of the scheduled exam**. Students who miss any of the term tests with legitimate reasons will have the midterm weight added to the final examination. The Final Exam will be held on a date to be selected later by the Department of Statistics and will be 3 hours in duration. Students who miss midterm tests, with or without valid documentation, will be reported to the Dean's office as having incomplete term work. This could have repercussions on their ability to write a deferred exam for the course, should such a deferral be requested.

Assignments: There are no assignments to be handed in for grading. However, lists of practice problems (some taken from the textbook) will be provided. Some will be discussed in the tutorials. Furthermore, each midterm test and the final exam will ask problems taken from these lists, in original or modified forms. Keep in mind that "**Practice, Practice, Practice**" is the gold rule for learning statistics. Don't forget to go though the practice problems.

Grading Scheme: The following are the minimum percentage grades required to receive each of the various letter grades. There is an additional requirement for obtaining a C or a D in the course: to obtain a grade of C or better, you must obtain at least 50% on the final examination; to obtain a D you must obtain at least 40% on the final examination.

Letter Grade	Percentage out of 100
A+	90-100
A	80-89
B+	75-79
B	70-74
C+	65-69
C	60-64
D	50-59
F	Less than 50

Class Communications

The University requires all students to activate an official U of M email account, which should be used for all communications between yourself and the university (including all your instructors). For full details of the Electronic Communication with Students please visit: `http://umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2014_06_05.pdf` All these email communications should comply with the University's policy on electronic communication

with students, which can be found at: http://umanitoba.ca/admin/governance/ governing_documents/community/electronic_communication_with_students_policy.html

Using Copyrighted Material

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 work must not be distributed in any format without permission.

Recording Class Lectures

Mohammad Jafari Jozani 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 Mohammad Jafari Jozani. Course materials (both paper and digital) are for the participant's private study and research. More details are available online at: http://umanitoba.ca/copyright/

Student Accessibility Services

If you are a student with a disability, please contact Student Accessibility Services (SAS) for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services, http://umanitoba.ca/student/saa/accessibility/
520 University Centre, (204) 474-7423, Student_accessibility@umanitoba.ca

Academic Integrity

It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences. Links to resources that describe academic dishonesty (including plagiarism, cheating, inappropriate collaboration and examination impersonation, as well as typical penalties) can be found at:

http://umanitoba.ca/faculties/science/undergrad/resources/webdisciplinedocuments.html
or
http://umanitoba.ca/faculties/science/undergrad/resources/webdisciplinedocuments.html

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 and to the UM Learn system.

http://umanitoba.ca/science/statistics/files/pages/2016/09/Schedule-A-ROASS-Statistics.pdf