



University of Manitoba
Faculty of Science
Department of Statistics

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1 Course Details

Course Title and Number	Mathematical Statistics, STAT 3800 (A01), CRN 11931
Number of Credit Hours	3
Class Times and Days of Week	9:30 am - 10:20 am, Mondays/Wednesdays/Fridays
Location for classes/labs/tutorials	115 Armes
Course Material	All course materials are posted on UMLearn web
Pre-Requisites	STAT 3400 (or STAT 3500) (C)

2 Instructor Contact Information

Instructor Name	Dr. Xikui Wang
Title and Address	Associate Dean, Faculty of Graduate Studies (FGS) Professor, Department of Statistics (DoS)
Office Locations	373 Machray Hall (DoS) and 503 University Centre (FGS)
Office Hours	Mondays/Wednesdays 10:30 - 11:30 am (373 Machray Hall) Tuesdays/Thursdays 1:30 - 2:30 pm (503 University Centre) Or by appointment (call or email to confirm)
Office Phone Numbers	204-474-9511 (FGS) and 204-474-6275(DoS)
Email Address	xikui.wang@umanitoba.ca I will return a phone call or email within 24 hrs (if available).

3 General Course Information

(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).

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 probability techniques that are of paramount importance for statistical inference. The emphasis is on developing useful techniques and skills of deriving important sampling distributions. Topics include transformation techniques, the method of conditioning, the Bayes' method, useful transforms by generating and characteristic functions, distributions related to order statistics, multivariate normal distributions, asymptotic distributions by means of convergence, and possibly other topics. A solid background in discrete and continuous distributions, and conditional expectation is required.

4 Course Goals

Our goal is to assist you to develop the following skills:

- **judgement:** understand the relationship between probability and statistics, and the bridge between them, the fundamental role and importance of probability in statistical inference,

- **analytic skills:** grasp and efficiently apply important methods for deriving sampling distributions (of functions of random variables),
- **comprehension and generalization:** see the forest from the trees, learn by analogy and draw methods about other cases from one related example,
- **critical thinking:** critically appraise and compare the strengths and limitations of different methods (“all that glitters is not gold!”).

5 Intended Learning Outcomes

Upon completing the course, we hope you become skillful in probability techniques and more interested in the discipline of statistics.

6 Textbook, Readings, Materials

A. Gut (2009) *An Intermediate Course in Probability*, (2nd edition), Springer

N. A. Weiss (2006) *A Course in Probability*, Pearson (STAT 3400 text)

L. M. Leemis (1986) Relationships among common univariate distributions, *The American Statistician* 40, 143–146

L. M. Leemis and J. T. McQueston (2008) Univariate distribution relationships, *The American Statistician* 62, 45–53

These materials (except for the Weiss book) are available for free on Springer online through the university library. Go to <http://umanitoba.ca/libraries/> and click “Sign In to My Account”. Add the above titles under “One Stop Search” and download.

7 Course Evaluation Methods

Time, Date and Place	Assessment Tool	Value of Final Grade
2:30 - 4:00 pm October 17, 2016 (room TBA)	Midterm Test 1	25%
2:30 - 4:00 pm November 14, 2016 (room TBA)	Midterm Test 2	25%
Time and Place TBA Final exam period: Dec. 12-22, 2016	Final Examination	50%

Notes:

The midterm tests and the final exam are closed book. No formula sheet will be provided.

Make-up midterm tests will not be scheduled.

Should you miss one test, you will be given a mark of zero unless you provide a legitimate excuse with acceptable documentation and notify me within 48 hours of the scheduled test (before or after), by phone or e-mail. The other test and the final exam would then respectively count for 25% and 75% of your final mark. Should you miss both tests with legitimate excuses and proper documents, your final exam will be 100%.

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.

8 Grading

Letter Grade	Percentage out of 100	Grade Point Range	Final Grade Point
A+	90-100	4.25-4.5	4.5
A	80-89	3.75-4.24	4.0
B+	75-79	3.25-3.74	3.5
B	70-74	2.75-3.24	3.0
C+	65-69	2.25-2.74	2.5
C	60-64	2.0-2.24	2.0
D	50-59	Less than 2.0	1.0
F	Less than 50		0

9 Expectations: I Expect You To

CARE and maintain academic integrity:

- (i) C: Collaboration, Consolidation, Commitment
- (ii) A: Attitude, Attendance, Attention
- (iii) R: Review, Rehearsal, Repetition
- (iv) E: Exploration, Experience, Enjoyment

10 Student Accessibility Services (SAS)

If you are a student with a disability, please contact 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

11 Expectations: You Can Expect Me To

I will provide **CARE** (Courage, Attention, Resource, Enthusiasm). **My role** is to dispel doubts, and most importantly, **inspire** you. I love teaching and my meaning of teaching is to help you find the meaning of learning.

12 Important Dates and Preliminary Schedule

Important dates:

- September 9, 2016: First lecture
- September 12, 2016: First tutorial
- September 14, 2016: Fee payment deadline
- September 21, 2016: Late registration/revision deadline
- October 6-7, 2016: Fall term break (no class)
- October 10, 2016: Thanksgiving Day holiday (no class)
- October 17, 2016: **Midterm Test One (room TBA), 2:30 - 4 pm**
- November 11, 2016: Remembrance Day holiday (no class)
- November 14, 2016: **Midterm Test Two (room TBA), 2:30 - 4 pm**
- November 18, 2016: Voluntary withdrawal deadline
- December 5, 2016: Last tutorial
- December 9, 2016: Last lecture
- December 12-22, 2016: **Final exam period**

This following preliminary schedule is subject to change at the discretion of the instructor and based on the learning needs of the students.

Preliminary Schedule of Lectures and Tutorials		
Week	Lectures	Tutorial
0	First class on Friday, September 9: course outline	
1	Review and Chapter 1	Review
2	Chapter 1	Chapter 1 Problems
3	Chapter 2	Chapter 1 Problems
4	Chapter 2 (No class on Oct. 7)	Chapter 2 Problems
5	Chapter 2 (No class on Oct. 10)	No tutorial (Holiday)
6	Chapter 3	Midterm Test 1 (room TBA)
7	Chapter 3	Discussion of Midterm Test 1
8	Chapter 4	Chapter 3 Problems
9	Chapter 4 (No class on Nov. 11)	Chapter 4 Problems
10	Chapter 5	Midterm Test 2 (room TBA)
11	Chapters 5 and 6	Discussion of Midterm Test 2
12	Chapter 6	Chapter 5 Problems
13	Chapter 6, other topics, review	Chapter 6 Problems

13 Laboratory/Tutorial Expectations

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

“**Practice, Practice, Practice**” is the gold rule for learning statistics. 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.

14 Course Technology

The computer, overhead projector, document camera and other technology will be used in teaching. It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by instructor and/or the University of Manitoba Student Accessibility Services. Student should not participate in personal direct electronic messaging / posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook) online and offline “gaming” during scheduled class time. If student is on call (emergency) the student should switch his/her cell phone on vibrate mode and leave the classroom before using it. (© S Kondrashov. Used with permission)

15 Class Communications

The University requires all students to activate an official University email account. 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

Please note that all communication between myself and you as a student must comply with the electronic communication with student policy (http://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.

16 Using Copyrighted Materials and Recording Class Lectures

Please respect copyright and we will use copyrighted content in this course. All course notes, assignments, tests, exams, practice exams and solutions are the intellectual property of your instructor or the Department of Statistics. Reproduction or distribution of these materials is strictly forbidden without their consent. For more information, see the University’s Copyright Office website at http://umanitoba.ca/copyright/orcontactum_copyright@umanitoba.ca.

Dr. Xikui Wang 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 from Dr. Xikui Wang. Course materials (both paper and digital) are for the participant’s private study and research.

17 Academic Integrity

Links to resources that describe academic dishonesty can be found at: <http://www.umanitoba.ca/faculties/science/undergrad/resources/webdisciplinedocuments.html> or at: <http://umanitoba.ca/faculties/science/undergrad/resources/webdisciplinedocuments.html>

It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences.