STAT 2400 Section A01
Introduction to Probability
Winter 2017

Time	MWF 9:30 a.m. – 10:20 a.m.
Location	306 Buller
CRN	51089

Instructor	Jenna G. Tichon
	321 Machray Hall
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Web Pages	UMLearn: `http://umanitoba.ca/umlearn`
	Statistics: `http://umanitoba.ca/statistics`
	Gradebook: `http://www.stats.umanitoba.ca/gradebook`

Office Hours:	Monday 2:30 p.m. – 3:30 p.m.
	Tuesday 1:00 p.m. – 2:00 p.m.
	Wednesday 10:30 a.m. – 11:30 a.m.
	Friday 10:30 a.m. – 11:30 a.m.

(Or by appointment. Please email me to set up an alternate time if necessary.)

Calendar Description

(Lab Required) Basic probability, discrete distributions including binomal, hypergeometric, geometric and Poisson, joint distributions, continuous distributions, statistical inference and applications involving discrete random variables. This course is not available to any student who has previously obtained credit for STAT 3500. Prerequisites: STAT 1000 or STAT 1001 (005.100) (C); and one of MATH 1232 (C), MATH 1690 (C), or MATH 1700 (B), or MATH 1701 (B).

Textbook

The textbook for this course is

Weiss, N.A. (2006), *A Course in Probability*, Pearson Ed. (Addison-Wesley).

A copy of the textbook should be available on four-hour reserve at the Science Library. The course follows the text very closely and there will be suggested problems from the text for each section which may appear on the midterms or final exam. The following books should also be available on four-hour reserve if you would like supplementary resources:

- *A First Course in Probability* (S.M. Ross, 2006)

- *Fundamentals of Probability with Stochastic Proccesses* (S. Gharamani, 2005)

- *Introduction to Probability*, (G. Roussas, 2007)

Evaluation

Midterm Tests (2)	50%
Final Examination	50%

The following are the minimum percentage grades required to receive each of the various letter grades: A^+ (90%), A (80%), B^+ (75%), B (70%), C^+ (65%), C (60%), D (50%).

Exam Information

- There will be two midterm tests scheduled during the lab times. The dates are tentatively scheduled for Wednesday, March 1 and Wednesday, April 5 during the lab period.

- Your best midterm will be worth 30% and your worst midterm will be worth 20% of your final grade.

- Your midterm will consist entirely of long answer questions. A practice midterm will be provided.

- Please check your Aurora exam schedule for the time and location of your final exam.

- If you miss a midterm test, you will be assigned a mark of zero, unless reasons and acceptable evidence are provided. If you miss a midterm test for an acceptable reason, your final exam will be worth 70% and the midterm you do write will be worth 30%, there are no makeup tests.

For quizzes, the midterm test and the final examination: (i) nonprogrammable handheld calculators are permitted (graphing calculators are **not** permitted), (ii) electronic devices, such as cell phones or headphones, are prohibited. There will be no formula sheet.

Labs

There is a lab scheduled every Wednesday afternoon. Attendance in the lab is mandatory. The labs will be a combination of a variety of topics including, but not limited to, proof writing techniques, review of material from prerequisite courses, and further practice problems from the lectures. All material covered in the labs may appear on the midterm tests or final exam. Occasionally lab periods may be used for additional instruction time.

Classroom Courtesy

Please be respectful of the instructor and your fellow students while attending class. This includes arriving on time, refraining from speaking to your neighbours during class time, and turning all electronic devices to silent. While I will make an effort to arrive to class early and stay around for a few minutes afterwards to answer questions, as I need time to set up/clean up and must make room for the next class, I will not always have time to answer involved questions. If I am unable to answer your question, I will direct you to come and speak with me in my office or to send me an email. I value giving students complete answers and am not dismissing your question if I request you to ask it later.

Course Website

All course material and news announcements will be posted on UMLearn. You will also be able to access the course discussion forums from this website.

Discussion Forum: On the course website you will find a discussion forum section. Each class I will start a thread listing any announcements made, overviewing what was covered in class, and listing suggested readings and practice problems for next class. This is the appropriate location to ask any questions that would be of general interest to the entire class, either about announcements or content from the course.

All discussion will be monitored closely by the Instructor. Please be courteous in posing questions and replying to questions on the board. Your best effort should be made to make clear questions in complete English sentences.

E-mail

To schedule an appointment outside of office hours or to ask a question that would not be suitable for the discussion forums (it involves your personal information or the answer would not be of interest to other students) you may email me at my university email address. Please note that if your question is answered on the course outline (which will be posted on UMLearn) I will simply direct you to find the answer yourself. The subject line of your emails should contain "STAT 2400". All emails should start with an opening salutation, be written in complete English sentences and be signed with your name and student number. Please note that I will not divulge grades over email. All emails received during the work week will be replied to within 24 hours. While I will generally check my work emails over the weekend in case there is an emergency, you can expect a reply to non-urgent matters received over the weekend by Monday at noon.

Office Hours

My office hours are listed at the top of the course outline. You do not need to make an appointment and may just show up to ask any questions that you may have. This is the perfect time to ask questions about course material, your midterms, review your coursework, or receive help with practice problems. If you can not make my scheduled office hours, please email me to make an appointment.

Important Dates

The voluntary withdrawal date is **March 31** (by which time you will have received your marks for your first midterm). There are no lectures from February 20th to February 24th and there is no lecture on April 14.

Academic Dishonesty

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/science/undergrad/resources/webdisciplinedocuments.html`

Copyrighted Material

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.

Note Sharing

Please note that all course materials are the intellectual property of the instructor and are not to be shared or altered without the explicit permission of the instructor. You do not have permission to upload any course notes, tests, assignments, or handouts to any note sharing websites. Please see the following site for more information: `https://umanitoba.ca/student/resource/student_advocacy/media/Message_note_sharing_December_2013.pdf`

Recording of Class Lectures

Your instructor 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 your instructor.

Use of Electronics in the Classroom

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. A student may use technology in the classroom setting only for educational purposes approved by the instructor and/or the University of Manitoba Accessibility Services. Students should not engage in electronic messaging/posting activities (e-mail, texting, video or voice chat, social networking (e.g. Facebook)) or electronic gaming during scheduled class time.

Class Communication

The University requires all students to activate an official University email account. Please note that all communication between your instructor and you as a student must comply with the Electronic Communication with Students Policy. Please see

`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.

Student Accessibility Services

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.

`http://umanitoba.ca/student/saa/accessibility/`

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. Schedule A will be posted on your instructor's UMLearn page.

Outline of the Covered Topics

Basic Concepts (Weiss, Chap. 1 and 2)

- A review of set theory
- Sample space, events
- Axioms of probability and basic probability rules

Combinatorial Probability (Weiss, Chap. 3)

- Counting: permutations and combinations
- The use of counting rules in probability calculations

Conditional Probability and Independence (Weiss, Chap. 4)

- Conditional probability and the general multiplication rule
- Independence
- Bayes' rule

Discrete Random Variables and Probability Distributions (Weiss, Chap. 5)

- Discrete random variables and probability mass functions
- Important counting random variables
- Poisson approximation to the binomial
- Binomial approximation to the hypergeometric

Jointly Discrete Random Variables (Weiss, Chap. 6)

- Marginal and joint probability mass functions
- Conditional probability mass functions
- Independent random variables
- Sums of discrete random variables

Expected Values of Discrete Random Variables (Weiss, Chap. 7)

- Basic properties of expected values

- Mean, variance, covariance and correlation of discrete random variables
- Conditional expectation

Introduction to Continuous Random Variables (Weiss, Chap 8.) (Time permitting)

- Continuous random variables, cumulation distribution functions and probability density functions
- Uniform, exponential and normal random variables
- Mean and variance of continuous random variables