University of Manitoba
Faculty of Science
Department of Statistics
Winter 2011

Course Title: Introduction to Probability II
Course No: 3400
Class Time: MWF 9:30-10:20am
Location: 115 Armes
Lab: M 2:30-3:55pm, 115 Armes

Instructor: Dr. Katherine Davies
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Office Hours: MW 11am-12pm, Th 1-2pm

I encourage students to contact me throughout the course whenever they feel the need. Whether you are asking a question about course material or are requesting to arrange a meeting, you can contact me by phone, email or in person. I have listed office hours above and I will do everything in my power to always be available during those times, however, sometimes important meetings are scheduled at that time without my consent. If an office hour is cancelled, I will notify you and if necessary, substitute it with a new one. These hours are not the only time I am available to you. I will always try to come to the classroom 5 minutes before class begins, and I can usually stay a few minutes after class, should you need to discuss something with me. Outside of my office hours, I welcome students to come to my office at other times which are convenient to them. To make an appointment, you can call me in my office or send me an email. Please note that I encourage interaction with your peers with respect to learning the material in the course and hence, if students prefer to come as a group to my office, that is okay with me. Often times you cannot make it to my office hours and you may decide to stop by my office at the spur of the moment. If this occurs and I am not busy, I will gladly meet with you. However, if I am busy, I may ask you to come at another time and do not take it personally in this case.

Course Description
This course is a continuation of STAT 2400. It will cover continuous distributions, properties of common distributions, and distributions of functions of random variables. Below I group these topics with reference to textbook chapters.

1. Continuous Random Variables and their Distributions (Chapter 8)
2. Jointly Continuous Random Variables (Chapter 9)
3. Expected Value of Continuous Random Variables (Chapter 10)
4. Generating Functions (Chapter 11)
5. Additional Topics

Prerequisites
The prerequisites for this course is STAT 2400 (C) and prerequisites/concurrent requirements are one of MATH 2720, MATH 2721, MATH 2730 or MATH 2731.

Attendance
Attendance in the lab is recommended in order to get the maximum value out of this course. In the labs, a qualified TA will be present to answer questions you may have and work through suggested practice problems.

Course Objectives and Expectations

My primary objectives in this class are for you to learn the material but also, to have a good experience. I also hope that students will see how useful probability and statistics can be in our everyday lives and perhaps become more interested in statistics as a study of discipline.

More specific objectives are listed below. At the completion of this course, you should be able to carry out the following tasks:
1) recall basic probability concepts;
2) distinguish between discrete and continuous random variables;
3) identify any appropriate random variable and its distribution/density function;
4) determine if two random variables are present and if appropriate, determine their joint distribution;
5) calculate various quantities such as expected value, variance, covariance and correlation;
6) solve a probability problem by producing an organized and detailed solution.

In order to achieve these goals, we can have the following agreements.

You can expect me to:
-plan the course and alter that plan as needed;
-provide you with class notes and lots of opportunities to practice applying the course material;
-be respectful, courteous and provide a good learning environment;
-give you feedback as the course progresses, primarily by returning your tests in a timely manner and going over it shall you desire this.

What I expect from you:
-attend class;
-ask questions when you have one, inside or outside of class;
-be courteous and respectful, which includes turning off your cell phone during class;
-only use a laptop in class for class purposes;
-check JUMP regularly;
-write your tests legibly and in the order the questions are provided.

Course Materials

There are four components to the course materials that are recommended to succeed in this course: (1) class notes; (2) course textbook; (3) online postings; (4) practice problems.
(1) You are responsible for creating your own set of complete **class notes** based on the lectures.
(2) The **required textbook** for this course is *A Course in Probability* by N.A. Weiss (Addison-Wesley, 2006). This will be used for assigning practice problems and is also a good resource to follow along with in conjunction with your class notes. The book can be purchased at the bookstore and a copy is alsoon reserve in the Sciences and Technology Library (which is located on the second floor of Machray Hall) and can be borrowed for up to 7 days.
(3) There is no course webpage but the **JUMP** portal will be used for this course. This is where course related material and announcements will be posted. Keep in mind that I may make announcements or provide material in class and that you are still responsible for these (even though they may not appear on JUMP). In order to use JUMP, you must use your UMnetID. If you choose not to use your UM email account, please have your mail forwarded to an appropriate account, since a circumstance may arise where I will need to contact all students quickly and I may do this using the JUMP distribution list.

(4) There are no assignments for this course but sets of **practice problems** from the course textbook will be provided to you. These problems provide you with a way to grasp the material and also test your knowledge. I will regularly post these sets of practice problems and some of these problems will be done in the labs. Answers to the odd-numbered problems are listed in the back of the textbook. Besides providing good practice, **I will put at least one practice problem on each of your tests**.

Course Evaluation and Weighting

There will be two components to your final grade: two tests and final exam. The weights of these two components are:

Tests - 50% (30% for best, 20% for other)
Final Exam - 50%

If you miss a test, you will receive a grade of 0, unless adequate justification and documentation is provided. Should you miss one test and provide this justification, then the test written will be worth 25% (and the remaining weight goes to the final exam). There are NO makeup tests.

Tests and Exam Date & Location

The two tests will take place during the labs with tentative dates as February 14 and March 14. Should one of these dates change, you will be informed in advance. The final exam will take place during the April examination period with its date and location to be scheduled by the Registrar's office.

Tests and Exam Format

The tests will contain between 5 and 10 problems and be 75 minutes in length. The final exam will be 3 hours in length and contain between 8 and 10 problems. The test and exam questions will require you to write solutions; part marks will be given accordingly. These questions will be similar to those worked out in class and your practice problems. As the test and exam dates approach, I will provide you with information about what material they will cover. The final exam and tests are closed book and only non-programmable calculators are permitted.

Test Followup

Tests will be returned to you in class and solutions will be posted shortly after. Should you desire to go over your test, I will gladly meet with you at a time convenient for both of us.

Grade Scale

For your final grade, I have the following "guarantees":

Minimum Percent Grade Required	Letter Grade
90	A+
80	A
75	B+
70	B
65	C+
60	C
50	D

This means, for example, that if you obtain 80% or more, you will receive no worse than an A.

Other Important Information

(1) It is your responsibility to be aware of the last day for voluntary withdrawal. For this term, the Registrar's office has this day as March 18, 2011.

(2) *A Note about Academic Dishonesty*: It is important that you understand what constitutes academic dishonesty and that you are familiar with the consequences. For descriptions of these terms and other issues, please see http://umanitoba.ca/science/student/webdisciplinedocuments.html.

(3) *Important Note from the Dean of Science*: It is your responsibility to ensure that you are entitled to be registered in this course. This means that you have:

- the appropriate prerequisites, as noted in the calendar description, or have permission from the instructor to waive these prerequisites;

- 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. For example, BIOL 1000 cannot be held for credit with BIOL 1020.

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 in which you are registered.

Course Timetable

A rough outline of the course timetable, including the basic and some subtopics, is as follows. At time we may be behind or ahead, but I will do my best to follow this schedule. Also included are tentative test dates.

Date(s)	Material	Textbook Reference
January 5	Review of Course Syllabus	N/A
January 7-12	Review of STAT2400	Chapters 5-7
January 14-February 4	Continuous Random Variables and their Distributions: continuous random variables, probability density functions, cumulative distribution functions, special continuous random variables, functions of a continuous random variable	Chapter 8
February 7-March 4	Jointly Continuous Random Variables: joint probability density functions, joint cumulative distribution functions, marginal and conditional density functions, independence, functions of continuous random variables	Chapter 9
February 14	**Test 1**: In lab	
February 21-25	Reading Week	
March 7-March 23	Expected Value of Continuous Random Variables: expectation and its properties, variance, covariance and correlation, conditional expectation, bivariate normal distribution	Chapter 10
March 14	**Test 2**: In lab	
March 25-April 6	Generating Functions: moments and moment generating functions, joint moment generating functions	Chapter 11
April 8	Additional Topics OR Review	