Math 318/201 **Probability with physical applications** **Jan-Apr, 2016**

Instructor: B. Kolesnik, `bkolesnik@math.ubc.ca`.

Lectures: Buchanan A201: Mon., Wed., Fri. 2:00-2:50 PM.

Office hours: LSK 300B: Mon. 3:00–3:50 PM, Wed. 1:00–1:50 PM, Fri. 10:00–10:50 AM, or by appointment.

Course webpage: `http://www.math.ubc.ca/~bkolesnik/318.html`

Text: The course text is S.M. Ross, "Introduction to Probability Models," 11th edition, Academic Press, (2014). Earlier editions are indistinguishable for our purposes apart from possible changes to page and problem numbers.

An optional more advanced reference is G.R. Grimmett and D.R. Stirzaker, "Probability and Random Processes," 3rd edition, Oxford, (2001).

There are interesting resources at: `http://www.math.uah.edu/stat/`

Outline: The course is designed for physics and engineering physics students but students in mathematics and other disciplines may also find it useful. The course will be based primarily on topics from the first five chapters of Ross. Highlights include:

1. Probability spaces
2. Independence and conditional probability
3. Discrete and continuous random variables
4. Expectation
5. Generating functions and characteristic functions
6. Convergence of random variables
7. Law of large numbers and central limit theorem
8. Confidence intervals
9. Discrete Markov chains
10. Random walk
11. Poisson process

Evaluation: There will be homework assignments, two tests, and a final exam.

Homework: Nine assignments will be given and marked for credit. Assignments are due at the beginning of class on the due date. No late assignments will be accepted. The assignment schedule is as follows:

Assignment given	Assignment due
January 8	January 15
January 15	January 22
January 22	January 29
January 29	February 5
February 12	February 26
February 26	March 4
March 4	March 11
March 11	March 18
March 18	April 1

Tests: There will be two 50-minute tests held during the regularly scheduled class hours on the following dates:

Wednesday, February 10
Wednesday, March 23

Missing a test normally results in a mark of zero. Exceptions may be granted in two cases: prior consent of the instructor or a medical emergency. In the latter case, the instructor must be notified within two working days of the missed test, and presented with a doctor's note immediately upon the student's return to UBC. When an exception is granted for a missed test, there is no make-up test, and the final exam mark will be used.

Important dates: The deadline to drop without a W standing is January 18. The deadline to withdraw with a W standing is February 12.

There will be no class on the following dates: February 8 (Family Day), February 15–19 (Midterm Break), March 25,28 (Easter).

Final exam: There will be a final examination during the April examination period.

Final mark: The final mark will be calculated as follows:

Homework: 10%
Tests: 20% each
Final exam: 50%

Prerequisites: You must have taken one of MATH 152, MATH 221, MATH 223 and also one of MATH 215, MATH 255, MATH 256, MATH 265, and you must either have taken or currently be taking one of MATH 256, MATH 257, MATH 316. You cannot receive credit for this course as well as credit for any one of MATH 302, MATH 303, STAT 241, STAT 251, STAT 302.

GNU Octave software: Some assignment questions require the use of GNU Octave software. You should download this onto your computer as soon as possible; it is free and there are links and instructions on the course webpage. If you prefer, you may use MATLAB instead.