Math 318/201 **Probability with Physical Applications** **Jan-Apr, 2015**

Instructor: Dr. G. Slade, Math Annex 1211, 604-822-3781, `slade@math.ubc.ca`.

Office hours: Mon. 15:00–15:50, Wed. 13:00–13:50, Fri. 10:00–10:50, or by appointment.

Course website: `http://www.math.ubc.ca/~slade/math318/318-web-15.html`

Text: The course text is S.M. Ross, "Introduction to Probability Models," 11th edition, Academic Press, (2010). The 10th edition is indistinguishable for our purposes, apart from changes to page numbers, and you should feel free to use the 10th edition. Problems assigned from the text will be identical in both the 11th and 10th editions. You can also use the 9th edition, but if so you will need to consult the 11th or 10th edition to be sure to do the correct homework problems.
An optional more advanced reference is G.R. Grimmett and D.R. Stirzaker, "Probability and Random Processes," 3rd edition, Oxford, (2001).

Outline: The course was originally designed for physics and engineering physics students, but students in mathematics, electric and computer engineering, 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 9	January 16
January 16	January 23
January 23	January 30
January 30	February 6
February 13	February 27
February 27	March 6
March 6	March 13
March 13	March 20
March 27	April 8

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

Wednesday, February 11, Wednesday, March 25.

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.

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 267, 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, COMM 290.

GNU Octave software: Some assignment questions require the use of GNU Octave software. You should instal this on your computer as soon as possible; it is free and there is a link to instructions on the course website. If you prefer, you may use MATLAB instead. Do not submit homework using any other programming language.

Updated December 23, 2014.