

Basic info

Instructor	Omer Angel, angel@math.ubc.ca
Website	http://www.math.ubc.ca/~angel/318
Schedule	M-W-F 14:00–15:00, Buchanan A201.
Office hours	Monday 15:00, Friday 10:00, Math annex 1210, or by appointment.
Online forum	We will use a piazza discussion board this term. You can ask any questions regarding the course there. The password to join the form is Kolmogorov . It is encouraged to answer other students' questions there. Significant participation will be receive extra credits. Obviously, do not share solutions to assignments (on piazza or elsewhere) before the due date.

Course outline

The course was originally designed for physics and engineering physics students, but students in mathematics, electrical and computer engineering, and other disciplines may also find it useful. It has significant overlap with the introductory probability sequence MATH 302 and 303. The main topics included are:

- Probability spaces
- Independence and conditional probability
- Discrete and continuous random variables
- Expectation, variance, moments
- Generating functions and characteristic functions
- Convergence of random variables
- The law of large numbers and central limit theorem
- Confidence intervals and hypothesis testing
- Discrete Markov chains
- Random walks
- Poisson processes

The course will be based primarily on topics from the first five chapters of the textbook.

Textbook The course will roughly follow the first 5 chapters of **Ross**, *Introduction to Probability Models*, 10th edition or later. Assigned homework will be distributed in class and online. Some recommended practice problems from the textbook will be suggested, but their numbers may differ if you use older editions of the book. An optional more advanced reference is **Grimmett and Stirzaker**, *Probability and Random Processes*.

Computing assignments

Part of the homework assignments involves numerical computation and simulations in **python**. You will be required to submit some of your code and its output. Python is freely available and easy to learn programming language. You can install a python environment on your computer for use anywhere and anytime, or use it online e.g. at <https://ubc.syzygy.ca/>

Evaluation

The final mark will be based on homework (15%), a mid-term (35%) and the final exam (50%). Additional credits may be given for significant participation in class or in the piazza discussion board. In cases where the final exam mark is significantly higher than the term marks, it may receive a higher weight on a case by case basis.

Homework. Weekly assignments will be given. These are due at the **beginning** of class on the due date, normally each Friday. Assignments handed after class begins, before the end of the due day receive 50% of the mark. No later assignments be accepted for credit. The single lowest assignment grade will be ignored, as will any assignments you are exempted from (see below). Due dates for assignments: Jan. 11,18,25; Feb. 1,8,15; Mar. 1,8,15,22; Apr 1.

Midterm. A midterm will take place during class on Friday Feb. 15.

Final Examination will take place in the April examination period. Please do not make travel plans before the exam schedule is announced.

Missed mid-terms and assignments will normally receive a zero grade. Exceptions may be granted by **prior consent** from me, or for a documented medical emergency. In case of medical problems, notify me as soon as possible (preferably before the test or due date), and present a doctor's note immediately after your return to UBC. If you miss and are exempted from the midterm, there is no make-up test, and the final exam mark will be used.