

**MATH 419**  
**MATH 545**

**Stochastic Processes**  
**Probability II**

**2017W Term 2, Jan-Apr 2018**  
The course is cross-listed 419/545.

**Instructor:** Dr. G. Slade, Math Annex 1211, 604-822-3781, [slade@math.ubc.ca](mailto:slade@math.ubc.ca)

**Course webpage:** <http://www.math.ubc.ca/~slade/math419/419-web-18.html>

**Office hours:** See course webpage.

**Prerequisite:** Math 418/544, which in turn requires Math 321. Background in analysis and probability equivalent to this sequence is essential—you should not enrol without it.

**Text:** R. Durrett, *Probability Theory and Examples*, 4th edition, Cambridge University Press, (2010). Available at: [https://www.math.duke.edu/~rtd/PTE/PTE4\\_1.pdf](https://www.math.duke.edu/~rtd/PTE/PTE4_1.pdf).

**Other references:**

G.R. Grimmett and D.R. Stirzaker, *Probability and Random Processes*, 3rd edition, Oxford, (2001). There is a solutions manual: G.R. Grimmett and D.R. Stirzaker, *One Thousand Exercises in Probability*, Oxford, (2001).

J.R. Norris, *Markov Chains*, Cambridge University Press, (1997).

D. Williams, *Probability with Martingales*, Cambridge University Press, (1991).

W. Feller, *An Introduction to Probability Theory and its Applications*, Wiley; Volume I, 3rd edition, (1968); Volume II, 2nd edition, (1971); this is a classic.

P.G. Doyle and J.L. Snell, *Random Walks and Electric Networks*. Available at: <http://arxiv.org/abs/math/0001057>

**Outline:** The course will be based on Chapters 5–8 of Durrett, with additional topics as time permits. The main topics are:

1. Martingales
2. Markov chains
3. Ergodic theory
4. Brownian motion

**Evaluation:** The final mark will be computed according to the following formula:

Homework: 50%

Exam: 50%.

**Homework:** Nine assignments will be given and marked for credit, with the following schedule. Assignments are due at the beginning of class on the due date. *No late assignments will be accepted.*

<u>Assignment given</u>	<u>Assignment due</u>
January 10	January 17
January 17	January 24
January 24	January 31
January 31	February 7
February 7	February 28
February 28	March 7
March 7	March 14
March 14	March 21
March 21	March 28

**Examination:** There will be a final examination held during the April examination period.

Updated December 26, 2017.