University of Toronto
Department of Statistics
STA347H – Probability I

Summer 2013

Lectures: Tuesdays and Thursdays 6:10 – 9 p.m. in SS1085
Instructor: Dr. Hadas Moshonov
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Office: Sidney Smith Hall room 6015.
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Office hours: Tuesdays and Thursdays 9-10 PM or by appointment. Additional office hours will be schedules before term test and final exam.

Course Description

This course provides a thorough overview of probability theory from a non-measure theoretic point of view. Topics include: random variables and random vectors, independence, conditional probability and conditional expectation and their applications, various types of convergence theorems, Markov chains and an introduction to simple stochastic processes such as Poisson and branching processes.

Textbook

There is no formal textbook for this course. Some useful reference books are:

- *Introduction to Probability Models,* 10th edition by Sheldon M. Ross.
- *Probability and Statistics, The Science of Uncertainty* by M. J. Evans and J.S. Rosenthal
- *A first Look at Rigorous Probability Theory* by J.S. Rosenthal

Evaluation

The grading scheme is the following:

Term Test to be held on Thursday, July 18 ,6:10-8 p.m.	35%
Final Exam	65%

If your final exam mark is better than your test mark, the exam weight will be 80% and the test weight will be 20%. The test room will be posted on the course website prior to the test.

Practice Problems

Reading material and practice problems for each topic will be posted on the web-site. They are **not** to be handed in. They will be appropriate preparation for the term test and final exam.

Important Notes

- The term test will be held on Thursday July 18 (6-8 p.m.) and will cover all the material in lectures up to that time. It will be closed book with no aids allowed beside a non-programmable calculator; a formula sheet will be provided.
- There is no makeup test. If the test is missed for a valid reason, you must provide appropriate documentation, such as the University of Toronto Medical Certificate, University of Toronto Health Services Form, or College Registrar's Letter. You must submit this documentation to the course Instructor (Hadas Moshonov) within one week of the test. Print on it your name, student number, course number and date. If documentation is not received in time, your test mark will be zero. If the test is missed for a valid reason, its weight will be shifted to the final exam.
- Any requests to have marked work re-evaluated must be made in writing within two days of the date the work was returned to the class. The request must contain a justification for consideration.
- This course requires a strong background in calculus. MAT235 and MAT237 is an essential pre-requisite.
- Important announcements, lecture notes, additional examples and other course info will be posted on the course web-page. **Check it regularly**. The website also has an electronic bulletin board that you can use to communicate with other students in the course.
- If an urgent matter arises, I may contact the entire class by e-mail. In order to receive these messages, please make sure that your ROSI account has your **`utoronto.ca`** e-mail.
- The lecturer and TA are there to help. Ask questions and alert us to any problems right away!

Academic Honesty Policy

You are responsible for knowing the content of the University of Toronto's Code of Behavior on Academic Matters at www.artsci.utoronto.ca/osai/students.
If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me.

Accessibility Needs

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classrooms, or course materials, please contact Accessibility Services as soon as possible:
disability.services@utoronto.ca or http://studentlife.utoronto.ca/accessibility

Tentative Work Schedule

Week Date	Topic	Readings (from Ross)
1-2 July 2-4	Review of basic probability theory; Sample space and events, probability measure, probability model, conditional probability, independent events, theorem of total probability and Bayes' rule.	Chapter 1
3-4 July 9-11	Discrete random variables. Continuous random variables. Jointly distributed random variables. Random vectors. Expectations of random variables. Moment generating functions. Limit theorems.	Chapter 2, (2.1-2.6, 2.8)
5 July 16	Conditional probability and conditional expectation. Applications. **A short Tutorial**	Chapter 3, (3.1-3.5)
6 July 18	**Term test + short lecture**	
7-8 July 23-25	Markov Chain – introduction, key concepts and applications.	Chapter 4, (selected sections)
9-10 July 30 August 1	Poisson process – introduction, key concepts and relation to Exponential distribution.	Chapter 5
11-12 August 6-8	Introduction to continuous time Markov Chains Review and final summary.	Chapter 6 (6.1,6.2)