

**STA 347H1 F, FALL 2015**  
**PROBABILITY I**

Time: T 6-9, place MC102, web-site: on Portal.

**Instructor:** Dragan Banjevic (dragan.banjevic@utoronto.ca), office BA8139, tel: 946-3939, office hours: T 5-6.

**Textbook:** Gutt Allan.: An Intermediate Course in Probability (2<sup>nd</sup> ed.). The book can be downloaded from U of T Library Catalog (go to Books and use the title).

**Useful but not required:** Grimmet, G., and Stirzaker D.: Probability and random processes (3<sup>rd</sup> ed.).

Evans, M., and Rosenthal, J.: Probability and statistics (2<sup>nd</sup> ed.).

Somewhat different approach to probability: Whittle, P.: Probability via expectation (4<sup>th</sup> ed).

**Marking scheme:** Term test (40%, October 27, 6-8PM, place TBA, class time), final exam 60% (3h, in exam period). There is no make-up test. If you miss the test with a valid reason (U of T doctor's note only) your final exam will have weight of 100%. Warning: difficulty increases from the test to the final; final covers complete course.

**Tutorials:** There are no tutorials, but TAs will held office hours every week. Time and place TBA. Some extra office hours before the final and term test will be available. Some handouts will appear on the web-site.

**Calculation:** No statistical software is required. Programmable calculators are not allowed on tests and final exam. Don't forget this.

**Course outline:** The course gives an intermediate introduction to probability theory. Almost all of the course material is covered by the textbook. Some theoretical results will be considered in more detail. Exercises from the book will be recommended in due course. The following is a tentative schedule for the course:

Introduction. Introduction to probability covered in more details.

Ch. 1. Multivariate Random Variables: Univariate and multivariate distributions, transformations, expectation.

Ch. 2. Conditioning: Conditional distributions and expectation

Ch. 3. Transforms: Probability and moment generating functions. Characteristic functions.

Ch. 4. Order Statistics: Unidimensional and multidimensional statistics from random samples.

Ch. 5. The Multidimensional Normal Distribution: Various definitions of multidimensional normal distribution and its transformations.

Ch. 6. Convergence: Different types of convergence, the law of large numbers and CLT.

Ch. 7. An outlook on further topics: some topics will be covered, such as 7.1 (extensions of the main limit theorems), and 7.7 (the Borel-Cantelli lemmas).

Ch. 8. The Poisson process: Various properties of a Poisson process (as time allows).