Mathematics 1550H – Introduction to probability

Trent University, Summer 2016   *[In Peterborough!]*

Instructor

Stefan Bilaniuk (pronounced Стефан Біланюк)

office: GCS 337

Office hours: Monday and Wednesday 12:00-12:50

   or by appointment, or just drop by!

phone: 705 748-1011 x7474

home: 705 742-7862 [Do *not* call between 9 p.m. and 8 a.m. unless it's an emergency.]

e-mail: `sbilaniuk@trentu.ca` [E-mail sent to this address sometimes disappears. If it's important, call!]

web: `http://euclid.trentu.ca/math/sb/`

Department of Mathematics

office: GCS 342

hours: weekdays 09:00-12:30

phone: 705 748-1011 x7531

e-mail: `math@trentu.ca`

Prerequisite

   MATH 1005H, or MATH 1100Y/1101Y, or MATH 1110H, or permission of the instructor. MATH 1100Y or MATH 1110H may be taken as a co-requisite.

Text

   Introduction to Probability (2nd Edition), by C.M. Grinstead and J. Laurie Snell, American Mathematical Society, 2003. It is available for free at:

   `http://www.math.dartmouth.edu/~prob/prob/prob.pdf`

   Various additional resources for this text can be found at:

   `www.dartmouth.edu/~chance/teaching_aids/books_articles/probability_book/book.html`

Meetings

   09:00-12:00 on Mondays and Wednesdays in GCS 106 during the S62 six-week summer session (20 June – 28 July).

Marking Scheme

   There will be at least 10 quizzes, at least 5 assignments, a test, and a final examination. The final mark will be calculated as follows:

Best 9 quizzes (9 @ 3% each)	27%
Best 4 assignments (4 @ 6% each)	24%
Test	15%
Final examination	34%

Please see the section *Schedule* below for the dates work will be written or due. Note that work worth at least 25% of the course should be marked and returned by the final date (Thursday, 14 July) to withdraw from the course without academic penalty. Also, please note that late work will be accepted – or not – at the discretion of the instructor.

   This scheme may be modified for individual students in *exceptional* circumstances, such as a lengthy absence due to illness. Any such modification will require the agreement of both the student and the instructor.

Content & Learning Outcomes, & Schedule

   MATH 1550H is an introductory probability course, with an emphasis on the foundations required to understand probability models and statistical methods. Upon successful completion of this course, a student should be able to have knowledge of some counting techniques, understand the concepts of independence of random variables and events, conditional probability, distinguish between discrete and continuous random variables, and understand the content of probability and density functions; recognize various discrete and continuous random variables, compute their expectations and variance, and apply their knowledge to simple modelling problems; have some elementary knowledge of bivariate distributions and joint probability distributions; and understand the statements of the Laws of Large Numbers, Chebyshev's Inequality, and the Central Limit Theorem.

Schedule

Please note that where the material covered is concerned this schedule is a polite fiction: no lesson plan survives contact with actual students unchanged! Additional material, including some not in the text, may be covered on assignments and in class, and other sources may be used to augment the text.

Week 1. *(20-24 June)* Chapters 1 & 2: Discrete probability distrbutions and continuous probability densities. Quiz #1 on Wednesday, 22 June.

Week 2. *(27 June - 1 July)* Chapters 3 & 4: Combinatorics, conditional probability. Quiz #2 written and Assignment #1 due on Monday, 27 June; Quiz #3 written on Wednesday, 29 June. *University closed on Friday, 1 July [Canada Day].*

Week 3. *(4-8 July)* Chapter 5: Examples of discrete and continuous distributions. Quiz #4 written and Assignment #2 due on Monday, 4 July; Quiz #5 written on Wednesday, 6 July.

Week 4. *(11-15 July)* Chapter 6: Expected values and variance. Test written and Assignment #3 due on Monday, 11 July; Quiz #6 written on Wednesday, 13 July. *The last date to drop this course without academic penalty is Thursday, 14 July.*

Week 5. *(18-22 July)* Chapters 7 & 8: Sums of random variables, Laws of Large Numbers. Quiz #7 written on and Assignment #4 due Monday, 18 July; Quiz #8 written on Wednesday, 20 July.

Week 6. *(25-29 July)* Chapters 8 & 9: Chebyshev's Inequality, independent trials, Central Limit Theorem. Quiz #9 written and Assignment #5 due on Monday, 25 July; Quiz #10 written on Wednesday, 27 July.

Examination period. *(2-3 August)* The final exam will written at a time and location to be determined.

Academic Integrity

Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offence and carries penalties varying from a 0 grade on an assignment to expulsion from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's Academic Integrity Policy. You have a responsibility to educate yourself – unfamiliarity with the policy is not an excuse. You are strongly encouraged to visit Trent's Academic Integrity website to learn more – `www.trentu.ca/academicintegrity`

For clarity, the following guidelines will apply in MATH 1550H:

You are permitted and encouraged to work with others and ask anyone willing (especially the instructor!) for explanations, hints, and suggestions on the assignments, and to consult whatever sources you wish. However, **all work submitted for credit must be written up entirely by yourself, giving due credit to all relevant sources of help and information. For the quizzes, test, and final exam, you may not give or receive any help**, nor use any aids except for a calculator (any that you like) and one letter- or A4-sized aid sheet with whatever you want on (all sides!) of it, except with the instructor's express permission.

Access to Instruction

It is Trent University's intent to create an inclusive learning environment. If a student has a disability and/or health consideration and feels that he/she may need accommodations to succeed in this course, the student should contact the Student Accessibility Services Office (SAS), Blackburn Hall Suite 132, 705 748-1281, `sas@trentu.ca`*. For Trent University in Oshawa Student Accessibility Services Office contact 905 435-5102, ext. 5024. Complete text can be found under Access to Instruction in the Academic Calendar.*

Web page

This course will make at most minimal use of Blackboard, and perhaps none at all. A web page at `euclid.trentu.ca/math/sb/1550H/` will have hopefully-up-to-date information and all handouts.