STA 257H1 F, Section L0101, Fall 2013
PROBABILITY AND STATISTICS I

Time and place: M 3-5, place MC102, W 3-4, place BA1160, web-site: on Portal.

Instructor: Dragan Banjevic (dragan.banjevic@utoronto.ca), office BA8139, tel: 946-3939, office hours: M 5:15-6.

Textbook: Rice, *Mathematical Statistics and Data Analysis, 3rd* ed.

Warning: This afternoon section of the course (L0101) is completely independent of the evening section (L5101) (as well as tests and final). So make sure you are registered in the right section!

Marking scheme: Ten short quizzes 16% (in tutorials), term test 34% (Oct 21, 2h, in class time, room TBA), final exam 50% (3h, in exam period). Term test and the final are closed book exams, without aids except a non-programmable calculator. A formula sheet will be provided. There are no make-up tests or quizzes. If you miss term test with a valid reason, its weight will be shifted to the final (and the final covers the complete course). For it, you must submit appropriate documentation to the course Instructor or the Departmental Office (SS6008) within two weeks of the test (**not** to TAs!). Print on it your name, student number, course number and date, denoted by "Term test". If documentation is not received in time, your test mark will be zero.

Tutorials: Tutorials are on Wednesdays, 4-5 (after class), beginning on September 18. Tutorial assignments (alphabetically) and locations: TBA. There will be a short quiz at the end of every tutorial, starting on September 25, ending on November 27, 10 quizzes in total. Your best 8 quizzes will be counted. There are no make-up quizzes or excuses for absence. Missing quizzes will be assigned zero mark. Important announcements, additional examples, past tests/exams and other course info will be posted on the course web-site. **Check it regularly**.

Calculation: You will need a basic scientific hand-calculator, with statistical functions, and experience in working with it (**start using it from the first day**). Inability to work with it will not be an excuse. Programmable calculators are not allowed on quizzes, term test and final exam. Don't forget this.

Assignments: Practice problems will be assigned weekly in the class, for you home preparation. They are not to be handed in. The solutions will not be posted. You may discuss them in tutorials or ask for help at OH.

Course outline: Almost all of the course material is covered by the textbook. Some theoretical results might be considered in more detail. This is a first course in mathematical statistics, with emphasis on the probability theory. Topics to be covered: probability models, random variables, discrete and continuous distributions, multivariate models, large-sample limiting results, some statistical applications. This corresponds to Chapters 1 to 7 of the textbook. A good background in basic calculus is an asset.

(C)-Random vectors (multivariate distributions) including the multivariate normal, functions of random vectors, mean vector and variance covariance matrices, the change of variables formula, probability integral transformation.
(D)-Some large-sample results including a central limit theorem and laws of large numbers. Proofs of these.

Note: This corresponds to parts of Chapters 1-->6 of the text and some additional material not found in the text. Please note that the test and the exam are based on the lectures (slightly more advanced than the text), problems and the text. Doing the suggested problems and studying the lectures is excellent preparation for the exam. It is not enough to just know results. You must know why they work. This requires a fair amount of pondering over the material and is difficult to do at the last minute. Don't be alarmed if you find a lecture difficult when you first encounter it in class. This material takes time to learn. There is a lot of new terminology.

STA257-Course Outline L5101

Instructor: Philip McDunnough, philip@utstat.toronto.edu , SS5016H

Text:

MATHEMATICAL STATISTICS AND DATA ANALYSIS, 3rd Edition
By John Rice
Publisher Duxbury
ISBN 0-534-39942-8

Note: This text is also used for STA261 .

Instructor's office hours : after class, via e-mail, by appointment.

TA office hours: Special TA office hours will be available before the test and the final exam.

Tutorials: Begin the 2nd week of class. See Blackboard for details.

Web Page : www.utstat.toronto.edu/philip/courses/sta257/home.html

Marking: one 3-hour test (40%), 3-hour final exam (60%) . No make-up test. Grade = .4xTest+.6xFinal or just the Final (out of 100) if it is to your benefit. A missed test increases the value of the final. Please understand the marking scheme. It is **extremely** unwise to not write the mid-term.

Assignments: None to be handed in. However, problems will be assigned from the lectures and the text. These can be discussed during your tutorials. The text has answers to most. Problems are to be taken up during your tutorials. Please come prepared with your questions.

Date of test:

Wed, Oct 16 from 7-10PM

Note: The test will be handed back during the 6-7PM tutorial. Questions regarding marking are to be directed to your TA.

Coverage:

(A)- Events and random variables, the Bernoulli random variable, Axioms of Probability (and Expectation), Inequalities (Markov, Jensen, etc...),continuity of P and E,distribution functions, Conditional Probability, Independence.
(B)- Discrete and continuous random variables: definitions,probability functions,probability density functions, probability and moment generating functions, characteristic functions, various expectation calculations, examples of the preceding applied to binomial, Poisson, geometric, normal, exponential and other types of random variables, an introduction to the Poisson process.

(C)-Random vectors (multivariate distributions) including the multivariate normal, functions of random vectors, mean vector and variance covariance matrices, the change of variables formula, probability integral transformation.
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