

UNIVERSITY OF TORONTO
STA261H1S-Probability and Statistics II
Summer 2016

Instructor: Dr. Z. Liu	Email	zizhen@utstat.utoronto.ca
	Office	6027D, Sidney Smith Hall
	Office Hour	To be posted on the course web page by 11 am, June 29
Lectures	Day and time	Mondays , Wednesdays 7:00 – 10:00pm
	Location	BA1160
Tutorials	Day and time	Mondays, Wednesdays 6:00 – 7:00pm
	Location	To be posted on the course web page by 11 am, June 29. Please attend your registered tutorials led by your respective Teaching Assistant (TA) at a right location.
Course website	http://portal.utoronto.ca	

Course Description

A sequel to STA257H1, providing a rigorous introduction to the logical foundations of statistical inference and the practical methodology engendered. Topics include: statistical models, parameters, samples and estimates; the general concept of statistical confidence with applications to the discrete case and the construction of confidence intervals and more general regions in both the univariate and vector-valued cases; hypothesis testing; the likelihood function and its applications; time permitting: the basics of data analysis, unbiasedness, sufficiency, linear models and regression.

Pre-requisite: STA257H1

Co-requisite

MAT235Y1 or MAT237Y1 or MAT257Y1 (MAT237Y1 or MAT257Y1 is strongly recommended), MAT223H1 or MAT240H1

Exclusion: ECO227Y1 or STA248H1 or STA255H1

Course webpage/Blackboard

The link to the course Blackboard is <http://portal.utoronto.ca>. Relevant course material will be made available on the Blackboard. Announcements, dates, problem sets, assignments, tutorials and aid centre information, and etc. will be posted on the Blackboard. So visit the Blackboard regularly.

Required Textbook

Mathematical Statistics and Data Analysis, 3rd edition, by John Rice, Brooks/Cole

Computing Software

We will use R for computing examples. R is freely available for download at <http://cran.r-project.org> for Windows, Mac, and Linux operating systems.

Calculators

You will need a calculator in test and exam. Any calculator that has logarithmic functions will be sufficient. Programmable calculators are not permitted on the test or exam. Calculators on phones or other devices equipped to communicate with the outside world will not be permitted during the term test and the final exam.

Tutorials

- Tutorials begin on June 29th. Tutorials meet twice a week on Mondays and Wednesdays 6:00 – 7:00pm followed by lectures 7:00 – 10:00 pm.
- The major purpose of tutorial is discussion and review of course material; no new material will be covered. Textbook exercises (posted on the course Blackboard) will be selected and assigned as tutorial questions.
- Short tutorial quizzes (no more than 10 minutes in duration) on materials of the previous class will be given. There will be a total of 11 quizzes, of which the best 10, each worth 1% will count towards your final grade.
- If a tutorial is missed for any reason, there will be no make-up quiz. A missed quiz may count as a dropped quiz. If you have any concerns about your tutorial such as late enrolment, illness, quiz regrade or your overall tutorial grade, please discuss the matter with your TA. TAs have full responsibility for their respective tutorial sections.

Additional Sources of Help

Your primary source of help with difficulties is your TA in the scheduled tutorial. Additional assistance will be available at the Statistics Aid Centre, Room 1091, in Sidney Smith Hall; a weekly schedule will be posted on the course website, and please feel free to drop in if you have questions.

Evaluation

Type	Weight	Tentative Due Date	Location
Weekly quizzes	10%	Mondays, Wednesdays (no more than 10 minutes)	Your tutorial room
Test	35%	6:00 – 8:00pm Wednesday, July 13 (followed by lecture starting from 8:10pm)	TBA
Final exam	55%	TBA (August 9 – 15)	TBA

Important Date

The last day to drop S section code courses from academic record and GPA (without academic penalty, i.e. drop date) is July 25, 2016.

Missed Tests

There are no make-up tests. Should you miss the term test due to illness, you are required to submit, within one week the proper University of Toronto "Verification of Student Illness or Injury" form.

For more information, go to <http://www.illnessverification.utoronto.ca>.

The test's weight will then be shifted to the exam. If this documentation is not received, your term test grade will be zero.

Communication

- If you find typos, errors in notes, assignments and tutorials, please let me know immediately by email, in class or in office hour. If you have questions about the general course material, please come to see me in my office hours. Please attend lectures, tutorials and Instructor and/or TA office hours.
- When sending me an E-mail, please use your university account and put the course code "STA261H1S", your name and student number in the subject line. I will answer your e-mail within 24 hours generally.

Lecture Schedule – Tentative

Week	Topics
Week 1 - 2 (Chapter 10.2 – 10.6, 9.8, 8.1 – 8.5, 8.7, 8.8)	Descriptive statistics: empirical cumulative distribution functions, Q-Q plots, probability plots, histograms, density curves, stem plots, measures of location, measures of dispersion, boxplots. Bootstrapping methods. Sampling distributions. Estimation: method of moments, maximum likelihood estimation (MLE). Consistency. Confidence intervals (CIs). Efficiency. Sufficiency. Exponential family. Rao-Blackwell theorem.
Week 2 - 4 (Chapter 9.1 – 6, 9.9)	Hypothesis testing, likelihood ratio test, generalized likelihood ratio tests, likelihood ratio tests for multinomial, Pearson's chi-square test.
Week 4 - 5 (Chapter 11, 12.1 – 12.2)	Two-sample inference: two independent samples, two paired samples, some basic principles of experimental design, one-way analysis of variance (ANOVA).
Week 5 - 6 (Chapter 13.2 – 13.6, 14.1 – 14.3)	Categorical data analysis: Fisher's exact test, Chi-squared tests of independence and homogeneity, Matched-pair designs, McNemar's test, odds ratios. Linear least squares.

Academic Offences

Academic offences are unacceptable and harm everyone. You are responsible for knowing the content of the University of Toronto's Code of Behaviour on Academic Matters at <http://www.artsci.utoronto.ca/osai/students>.

And please carefully note the following:

- Requests for a written test remark may only be considered if you write your test in ink.
- Grading oversights such as addition errors and overlooked work must be reported to your TA immediately upon receiving your test paper at class. So check it over as soon as you get it back.

Accessibility Needs

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns, please contact Accessibility Services as soon as possible at:

disability.services@utoronto.ca or <http://studentlife.utoronto.ca/accessibility>