DEPARTMENT OF MATHEMATICAL AND COMPUTATIONAL SCIENCES
UNIVERSITY OF TORONTO MISSISSAUGA

STA314H5F LEC0101
Introduction to Statistical Learning
Course Outline - Fall 2019

Class Location & Time	Fri, 11:00 AM - 02:00 PM MN 1210
Instructor	Stanislav Volgushev
Office Location	Room 3032, Deerfield Hall
Office Hours	
E-mail Address	stanislav.volgushev@utoronto.ca
Course Web Site	

Course Description

A thorough introduction to the basic ideas in supervised statistical learning with a focus on regression and a brief introduction to classification. Methods covered will include multiple linear regression and its extensions, k-nn regression, variable selection and regularization via AIC,BIC, Ridge and lasso penalties, non-parametric methods including basis expansions, local regression and splines, generalized additive models, tree-based methods, bagging, boosting and random forests. Content will be discussed from a statistical angle, putting emphasis on uncertainty quantification and the impact of randomness in the data on the outcome of any learning procedure. A detailed discussion of the main statistical ideas behind crossvalidation, sample splitting and re-sampling methods will be given. Throughout the course, R will be used as software, a brief introduction will be given in the beginning. [36L, 12T]

Prerequisite: MAT223H5/MAT240H5; STA258H5/ECO327Y5; STA260H5
Corequisite: STA302H5;Permission of the Instructor (SCI)
Distribution Requirement: SCI

Students who lack a pre/co-requisite can be removed at any time unless they have received an explicit waiver from the department. The waiver form can be downloaded from here.

Textbooks and Other Materials

The course will be loosely following parts of the textbook 'An Introduction to Statistical Learning' by James, Witten, Hastie and Tibshirani. This book is recommended but not required since course material will be self contained.

A useful book for advanced reading is 'Elements of Statistical Learning' by Hastie, Tibshirani and Freedman

Assessment and Deadlines

Type	Description	Due Date	Weight
Quiz	Quizzes in class	On-going	20%
Term Test	Midterm written in class	2019-10-25	25%
Final Exam	Closed book exam covering all material in the course	On-going	40%
Other	Online assignments and data analysis related to prediction competition	On-going	15%
		Total	100%

More Details for Assessment and Deadlines

Quizzes will be held in class on a regular basis without prior announcement.

There will be no graded homework, but practice problems will be given on a weekly basis and discussed in tutorials.

A prediction competition will be held towards the end of the course. There will be several small assignments in the second half of

semester (worth 10% in total) related to the prediction competition.

In addition to the usual credits, top students in the prediction competition will be able to get up to 10% extra credit. Details will be announced in class.

Penalties for Lateness

No late assignments will be accepted.

Procedures and Rules

Missed Term Work

If you miss the midterm (with proper documentation), the final will count 65%. All documentation must be presented to the professor, not the TA.

To request special consideration, bring supporting documentation to the instructor in person during office hours at least one week in advance.

In case of illness, bring a U of T medical certificate to the instructor within one week of the missed work. The certificate must specify the exact period during which you were unable to carry out your academic work.

Missed Final Exam

Students who cannot write a final examination due to illness or other serious causes must file an online petition **within 72 hours of the missed examination**. Original supporting documentation must also be submitted to the Office of the Registrar **within 72 hours of the missed exam**. Late petitions will **NOT** be considered. If illness is cited as the reason for a deferred exam request, a U of T Verification of Student Illness or Injury Form must show that you were **examined and diagnosed at the time of illness and on the date of the exam, or by the day after at the latest**. Students must also record their absence on ACORN on the day of the missed exam or by the day after at the latest. Upon approval of a deferred exam request, a non-refundable fee of $70 is required for each examination approved.

Academic Integrity

Honesty and fairness are fundamental to the University of Toronto's mission. Plagiarism is a form of academic fraud and is treated very seriously. The work that you submit must be your own and cannot contain anyone elses work or ideas without proper attribution. You are expected to read the handout How not to plagiarize (http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize) and to be familiar with the Code of behaviour on academic matters, which is linked from the UTM calendar under the link Codes and policies.

Final Exam Information

Duration: 2 hours
Aids Permitted: None

Additional Information

There will be a small amount of graded homework but it is highly recommended that you work on the weekly practice problems and go to the tutorial sessions where solutions to those problems will be discussed.

Instructor office hours will be held on Fridays, time TBA in lectures.

TA office hours will be held on Wednesdays after tutorials.

Last Date to drop course from Academic Record and GPA is November 7, 2019.