The Master of Science and Doctor of Philosophy degrees in Statistical Machine Learning may be taken jointly in the Department of Computing Science and in the Department of Mathematical and Statistical Sciences. The program emphasizes the theoretical aspects of the design and analysis of machine learning algorithms using tools of statistics and computer science.

Students can apply either to the Department of Computing Science or to the Department of Mathematical and Statistical Sciences to participate in this program. The department the student applied to becomes the host department of the student, gives his/her degree and does the administration of the program.

Apart from the specifics of the program regarding the entrance and course requirements detailed below, the respective requirements of the graduate program of the student's host department apply. For details of the Computing Science Department requirements see §205.16 and for details of the requirements of the Mathematical and Statistical Sciences Department see §205.38 of the Calendar.

**MSc Program**

*Entrance Requirements*

The entrance requirement for the Master of Science degree in Statistical Machine Learning is a four-year degree in Computing Science or in Mathematical and Statistical Sciences with a GPA of 3.0 or better in the last two years of study, or an equivalent qualification from a recognized institution.

*Course Requirements*

The MSc degree can be obtained only in a thesis-based program. To complete the degree, *18 in graduate courses at the 500-level or higher from a list of approved courses must be taken, including *9 at the 600-level and a thesis is required. The course work must include courses from both the Department of Computing Science and the Department of Mathematical and Statistical Sciences. Students who applied to the Department of Computing Science must also take CMPUT 603.

**PhD Program**

*Entrance Requirements*

The entrance requirement for the PhD program in Statistical Machine Learning is, normally, an MSc degree in Computing Science or in Mathematical and Statistical Sciences, or equivalent.

*Course Requirements*

In addition to the examinations called for by the general regulations in the host department, the student must successfully complete an entrance year which includes at least two full terms of course work. The program of a full-time student in each of these terms shall normally include at least three courses from the list of approved courses (graduate or senior undergraduate, Computing Science or Mathematical and Statistical Sciences). Students who applied to the Department of Computing Science must also take CMPUT 603.

**Entrance Year Course Requirements (PhD Program)**

Students must select two of the following core courses:

- STAT 571 Probability and Measure
- STAT 566 Methods of Statistical Inference (or STAT 664, Advanced Statistical Inference)
- STAT 665 Asymptotic Methods in Statistical Inference

Similarly, students must select another two of the following core courses:

- CMPUT 551 Machine Learning
- CMPUT 670 Numerical Optimization: Theory and Algorithms
- CMPUT 651 Probabilistic Graphical Models
- CMPUT 609 Reinforcement Learning in Artificial Intelligence

Students who applied to the Department of Computer Science must also take CMPUT 603 (Teaching and Research Methods). Students who applied to the Department of Mathematical and Statistical Sciences may take CMPUT 603.

For completing their course requirements, in addition to the courses listed above, students can also select courses from the following ones:

- STAT 512 Techniques of Mathematics for Statistics
- STAT 575 Multivariate Analysis
- STAT 580 Stochastic Processes
● STAT 671 Probability Theory I
● STAT 672 Probability Theory II
● STAT 503: Directed Study III
● STAT 679 Time Series Analysis
● STAT 578 Regression Analysis
● CMPUT 615 Applications of Machine Learning in Image Analysis
● CMPUT654 Online learning
● CMPUT607 Reinforcement Learning
● CMPUT651 Decision Making in AI: From Foundations to the State of the Art
● CMPUT650 Topics in Artificial Intelligence: Learning To Make Decisions
● CMPUT607 Reinforcement Learning in Practice
● CMPUT605 Statistical Natural Language Processing