

MMath Computer Science Data Science Specialization

Data Science leverages large volumes of data generated from numerous and diverse sources, as well as any new kind of cloud interaction as it becomes available in our increasingly digital world.

In this program you will study the application and development of methods that facilitate insight from available data in order to understand, predict, and improve business strategy, products and services, marketing campaigns, medicine, public health and safety, as well as numerous other pursuits.

The methods of Data Science involve elements of both Statistics and Computer Science. The need for integrated graduate training across both disciplines is acutely felt across all industries. These two programs in Computer Science and Statistics are seamlessly integrated with one another and provide breadth and depth in both areas as they pertain to the emerging and world-recognized discipline of data science. Individuals with knowledge in this area are in high demand.

Admission Requirements:

Applicants to the Data Science specialization in Computer Science should satisfy the admission requirements of the Master of Mathematics in Computer Science degree programs:

- Honours bachelor degree in Computer Science, Engineering or related degree with a minimum overall B+ (78%) average from a recognized university
- A formal background in the following areas of computer science: programming languages, data structures, operating systems, algorithms, computer organization and architecture and a background in calculus, linear algebra, probability and statistics
- Experience in a senior level statistics course is preferable, but not required

Structure and Length:

The Data Science specialization in Computer Science and in Statistics will have a common structure but a different emphasis depending on which specialization students are admitted to, their skill sets, and interests. Students will graduate with advanced training in both Computer Science and Statistics, taking a combination of required and elective courses that provide a solid foundation in this emerging area.

The MMath Computer Science, Data Science specialization consists of eight one-term graduate courses. Students may elect to take an optional internship position for one term. The expected duration is three terms (four if internship is included).

Courses:

All Computer Science Data Science students should take a minimum of 4 CS courses. At least two of the CS courses should be at the 700 or 800 level, at least one of which should be at the 800 level.

One foundational course to be completed in the Fall (entry term).

- STAT 845 Statistical Concepts for Data Science (for non-STAT major background students)

Two common core courses:

- STAT 847 Exploratory Data Analysis
- CS 651 Data-Intensive Distributed Computing

One required breath course:

- CS 648 Database System Implementation
- CS 680 Introduction to Machine Learning
- CS 685 Machine Learning Theory: Statistical and Computational Foundations

Data Science students must take four additional elective courses from a list of selected graduate courses in the 600, 700, and 800-level series in Computer Science, and the 800 and 900-level series in Statistics.

* specialization pending senate approval



MMath Statistics Data Science Specialization

Data Science leverages large volumes of data generated from numerous and diverse sources, as well as any new kind of cloud interaction as it becomes available in our increasingly digital world.

In this program you will study the application and development of methods that facilitate insight from available data in order to understand, predict, and improve business strategy, products and services, marketing campaigns, medicine, public health and safety, as well as numerous other pursuits.

The methods of Data Science involve elements of both Statistics and Computer Science. The need for integrated graduate training across both disciplines is acutely felt across all industries. These two programs in Computer Science and Statistics are seamlessly integrated with one another and provide breadth and depth in both areas as they pertain to the emerging and world-recognized discipline of data science. Individuals with knowledge in this area are in high demand.

Admission Requirements:

Applicants to the Data Science specialization in Statistics should satisfy the admission requirements of the Master of Mathematics in Statistics degree programs:

- Honours bachelor degree in Statistics, Mathematics, or related degree with a minimum overall B+ (78%) average from a recognized university
- A background in calculus, linear algebra, and computer science
- Experience in a senior level computer science course is preferable, but not required

Structure and Length:

The Data Science specialization in Computer Science and in Statistics will have a common structure but a different emphasis depending on which specialization students are admitted to, their skill sets, and interests. Students will graduate with advanced training in both Computer Science and Statistics, taking a combination of required and elective courses that provide a solid foundation in this emerging area.

The MMath Statistics, Data Science specialization consists of eight one-term graduate courses. Students may elect to take an optional internship position for one term. The expected duration is three terms (four if internship is included).

Courses:

All Statistics Data Science students should take a minimum of 4 STAT courses, and no courses that are neither CS nor STAT

One foundational course to be completed in the Fall (entry) term.

- CS 600 Fundamentals of Computer Science for Data Science (non-CS major background).

Two common core courses:

- STAT 847 Exploratory Data Analysis
- CS 631 Data-Intensive Distributed Analysis

One required breath course:

- STAT 841 Statistical Learning: Classification
- STAT 842 Data Visualization
- STAT 844 Statistical Learning: Function estimation

Data Science students must take four additional elective courses from a list of selected graduate courses in the 600, 700, and 800-level series in Computer Science, and the 800 and 900-level series in Statistics.

* specialization pending senate approval

