HONOURS BSC COMPUTER SCIENCE AND BSC MATHEMATICS (DATA SCIENCE)

Overview
Mathematics

Mathematics and statistics are not only powerful problem-solving tools, but also highly creative fields of studies that combine imagination with logic, and precision with intuition.

Mathematics is much more than numbers! Its basic goal is to reveal and model general patterns to help explain our world, whether they be found in electrical impulses in the human nervous system, the evolution of animal populations in their habitats, fluctuations in stock-market prices, or electronic communications. Mathematics reaches far beyond science and engineering into medicine, business and the social sciences.

Advances in mathematics and statistics lie behind many discoveries that are now part of our daily lives, such as MRI scanners, digital compression of music and video, secure electronic communications, data mining, genomic algorithms, futures pricing, and many other innovations.

The Department of Mathematics and Statistics offers Honours, majors and minors both in mathematics and in statistics. Our Honours program in statistics is accredited by the Statistical Society of Canada, allowing graduates to earn the A.Stat. professional designation. Moreover, the Department offers a joint honours program in mathematics and economics, a joint honours program in mathematics and computer science, as well as a multidisciplinary program in financial mathematics and economics. All our honours programs also include the co-operative education option.

This program is offered in English and in French.

Computer Science

Computer science at the School of Electrical Engineering and Computer Science combines the study of computation and information processing fundamentals with their application in the world around us. Computer scientists build fast, reliable, scalable and secure software systems to organize and analyze information. The honours curriculum comprises advanced topics in databases, artificial intelligence, computer graphics, security, distributed computing and algorithm design, culminating in an honours project.

This program teaches graduates how to use their creative and innovative talents to conceive, design and implement software systems. The French Immersion Stream is now available to all students in the Computer Science program. Our degrees are very flexible and include options, minors and a major, which can be used to explore connections between computer science and many other fields of study.

Program Requirements

Co-operative education is available with this program.

The French immersion stream is available with this program.

Requirements for this program have been modified. Please consult the 2025-2026 calendars (https://catalogue.uottawa.ca/en/archives/) for the previous requirements.

Compulsory courses at the 1000 level

ENG 1112	Technical Report Writing	3 Units
ITI 1100	Digital Systems I	3 Units
ITI 1120	Introduction to Computing I	3 Units
ITI 1121	Introduction to Computing II	3 Units
MAT 1320	Calculus I	3 Units
MAT 1322	Calculus II	3 Units
MAT 1341	Introduction to Linear Algebra	3 Units
MAT 1348	Discrete Mathematics for Computing	3 Units

Compulsory courses at the 2000 level

CEG 2136	Computer Architecture I	3 Units
CSI 2101	Discrete Structures	3 Units
CSI 2110	Data Structures and Algorithms	3 Units
CSI 2120	Programming Paradigms	3 Units
CSI 2132	Databases I	3 Units
CSI 2911	Professional Practice in Computing	3 Units
MAT 2122	Multivariable Calculus	3 Units
MAT 2125	Elementary Real Analysis	3 Units
MAT 2143	Introduction to Group Theory	3 Units
MAT 2371	Introduction to Probability	3 Units
SEG 2105	Introduction to Software Engineering	3 Units
STA 2100	Introduction to Statistics	3 Units

Compulsory courses at the 3000 level

CEG 3185	Introduction to Data Communications and Networking	3 Units
CSI 3104	Introduction to Formal Languages	3 Units
CSI 3105	Design and Analysis of Algorithms I	3 Units
CSI 3120	Programming Language Concepts	3 Units
CSI 3131	Operating Systems	3 Units
CSI 3140	WWW Structures, Techniques and Standards	3 Units
MAT 3341	Applied Linear Algebra	3 Units
MAT 3373	Methods of Machine Learning	3 Units
SDS 3386	Data Science Lab	3 Units
STA 3300	Regression Analysis	3 Units

Compulsory courses at the 4000 level

CSI 4106	Introduction to Artificial Intelligence	3 Units
CSI 4142	Fundamentals of Data Science	3 Units
STA 4306	Computational Statistics	3 Units
STA 4320	Topics in Statistics	3 Units

Optional Courses

3 optional course units from:		3 Units
MAT 2141	Honours Linear Algebra	
MAT 2342	Introduction to Applied Linear Algebra	
3 optional course units from:		3 Units
CSI 4145	Machine Learning	
MAT 4373	Mathematical Machine Learning	
3 optional course units from:		3 Units
CSI 4900	Honours Project	
MAT 4900	Undergraduate Research Project	

http://catalogue.uottawa.ca/en/undergrad/honours-bsc-computer-science-bsc-mathematics/index.html

9 optional course units from:		9 Units
MAT 3377	Sampling and Surveys	
MAT 4387	Optimization: Theory and Practice	
STA 3301	Analysis of Experimental Designs	
STA 3302	Introduction to Time Series Analysis	
STA 4307	Multivariate Statistical Methods	
3 optional course units from:		3 Units
CSI 3130	Databases II	
CSI 4107	Information Retrieval and the Internet	
CSI 4130	Computer Graphics	
CSI 4139	Design of Secure Computer Systems	
6 optional course units in mathematics (MAT) or computer science (CSI) at the 3000 or 4000 level		6 Units
6 optional course units in computer science (CSI) at the 2000 or 3000 or 4000 level		6 Units
6 optional course units in mathematics (MAT) at the 2000 or 3000 or 4000 leve		6 Units
9 elective course units offered by the University of Ottawa excluding courses offered by the Faculty of Science and the Faculty of Engineering		9 Units
Total:		**150 Units**