MATHEMATICS

In the Mathematics program, students learn to model real-life situations, to formulate their findings and to deduce guiding principles. They gain sound knowledge in computer science and become an indispensable aid to managers and entrepreneurs in taking educated decisions based on scientific criteria and established parameters and constraints. Trained in statistics, they can draw up reliable surveys used by authorities to amass information that would serve as the foundation for guidelines and strategies.

This program provides general training in mathematics with particular attention to fostering scientific curiosity and critical thinking, as well as to bringing together theory and practice in view of the necessary continuity and cooperation between universities and industry sectors. Through a choice of electives, students can earn 24 credits in statistics, which is required by the Association des statisticiennes et statisticiens du Québec in order to receive the Stat.ASSQ designation.

WHAT OUR STUDENTS CAN DO FOR YOU

Research and Development

- Feasibility studies on neural networks in medical imaging

- Explore algebraic representation theories

- Compare estimation and ratio calculation methods on client databases

- Mathematical interpretation to minimize costs

- Pick's Theorem and its applications (in C++)

Development and Maintennce

- Develop estimation applications using SAS

- Convert Access and Excel files into SAS data sets

- Export and extract SAS data

- Validate and correct data

Management

- Write research papers and reports

- Develop sampling and stratified sampling plans, and calculate sample sizes

- Analyze and validate data before imputation

Design

- Data base analysis (SQL, Oracle, client DB)

- Descriptive analyses: Chi-squared test, Student's t-test, sampling calculation and client consultation

- Analyze, design and implement algorithms in C++, and validation testing

- Analyze test results

- Statistical analysis of databases

- Design algorithms for production performance prediction

KNOWLEDGE AND SKILLS

Term	Description
S-1	Discrete mathematics; elements of analysis; elements of algebra; introduction to linear algebra and survey methodology.
S-2	Analysis and programming; techniques of mathematical analysis; linear algebra; linear programming and probability.
S-3	Data structures; mathematical models; numbers and polynomials; supplementary analysis and statistics.
S-4	Computer graphics; numerical methods for linear algebra; differential and integral calculus in Rn; nonlinear programming and stochastic processes.
S-5	Differential equations; modules and matrices; linear statistical models; and two electives.
S-6	Numerical analysis; complex functions; Bayesian statistics; and two electives.

ORGANIZATION OF STUDY (S) AND WORK TERM (W)

1st year			2nd year			3rd year			4th year			5th year
FALL	WIN	SUM	FALL	WIN	SUM	FALL	WIN	SUM	FALL	WIN	SUM	FALL
S-1	S-2	W-1	S-3	W-2	S-4	W-3	S-5	W-4	S-6			
	S-1		S-2	S-3	W-1	S-4	W-2	S-5	W-3	S-6	W-4	S-7

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