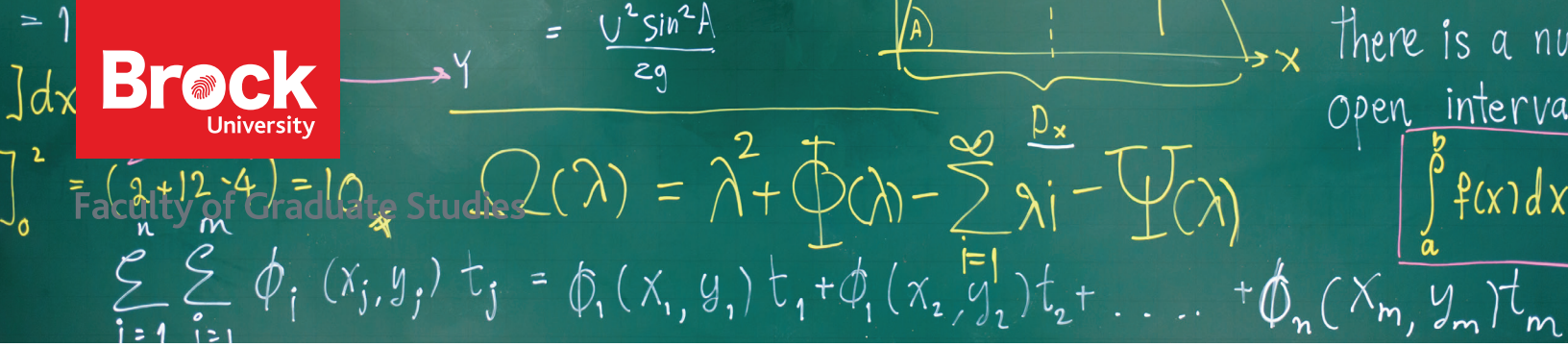

Master of Science in Mathematics and Statistics

A unique program aimed at providing students with an intensive advanced education in the areas of mathematics and statistics. Students can follow either the mathematics stream (algebra and number theory, computer algebra algorithms, dynamical systems, partial differential equations and symmetry analysis, functional analysis, solutions and integrable systems, topology, mathematical music theory, mathematics education, probability theory and stochastic processes) or the statistics stream (advanced statistical analysis, computational methods, applications to stochastic models).

PROGRAM DURATION: 2 years (6 terms)
RESEARCH FIELDS/SPECIALIZATIONS:

Mathematics

- Algebraic number theory
- Cellular automata, discrete dynamical systems and complex networks
- Combinatorial and additive number theory
- Computational methods for solving algebraic and differential systems
- Cryptography
- Geometric curve flows
- Graph Theory and Algorithmic Game Theory
- Group and ring theory
- High performance parallel computing
- Mathematical music theory
- Mathematical physics and General Relativity
- Mathematics education
- Nonlinear functional analysis and applications to optimization, game theory, mathematical economics, and differential systems
- Probability and measure theory
- Solitons and integrability of partial differential equations
- Symmetry analysis and computer algebra applied to nonlinear differential equations

Statistics

- Statistical Inference Methods and Applications
- Computational methods and applications to stochastic models
- Convergence and Efficiency of Markov Chain Monte Carlo Algorithms

ADMISSION REQUIREMENTS:

Successful completion of four year Bachelor's degree, or equivalent, in Mathematics or Statistics, or a related field, with an average of not less than B+ average. Agreement from a faculty advisor to supervise the student is also required for admission to the program.

Application deadline: November 30 for January entry, February 1 for September entry

Entry: January/September

FUNDING:

This is a funded program.

Our funding packages consist of a combination of different sources of funding including graduate fellowships and graduate assistantships. This year, graduate students enrolled in a full-time, research-based Master's program will typically receive:

FUNDING PACKAGES	
Domestic Students	$15,576
International Students	$22,076

Students are eligible to apply for scholarships. For more info visit:
brocku.ca/graduate-studies/scholarships-awards/

ARE YOU INTERESTED IN:

- Pursuing in-depth studies of a selected area of mathematics
- Learning advanced methods and tools of modern statistics
- Working on a cutting-edge research project in mathematics or statistics
- Developing quantitative and computational skills which will give you advantage in today's competitive job market
- Preparing for advanced graduate studies at the doctoral level

CAREER OPPORTUNITIES:

- PhD programs in Mathematics, Statistics and related fields
- Education
- Industry careers in fields such as insurance, finances, software development, marketing, and any other field where logical thinking, problem-solving and knowledge of qualitative methods is required
- Research positions in medical and technological fields requiring statistical, computational, modelling and data analysis skills
- Positions in government agencies in statistics and data analysis

TRANSFERABLE SKILLS:

- Quantitative reasoning
- Logical thinking
- Computational and programming skills
- Data analysis skills
- Problem solving
- Intellectual rigour
- Clear and precise communication

CONTACT INFORMATION

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Henryk Fukś
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hfuks@brocku.ca

Graduate Administrative Coordinator
Elena Genkin
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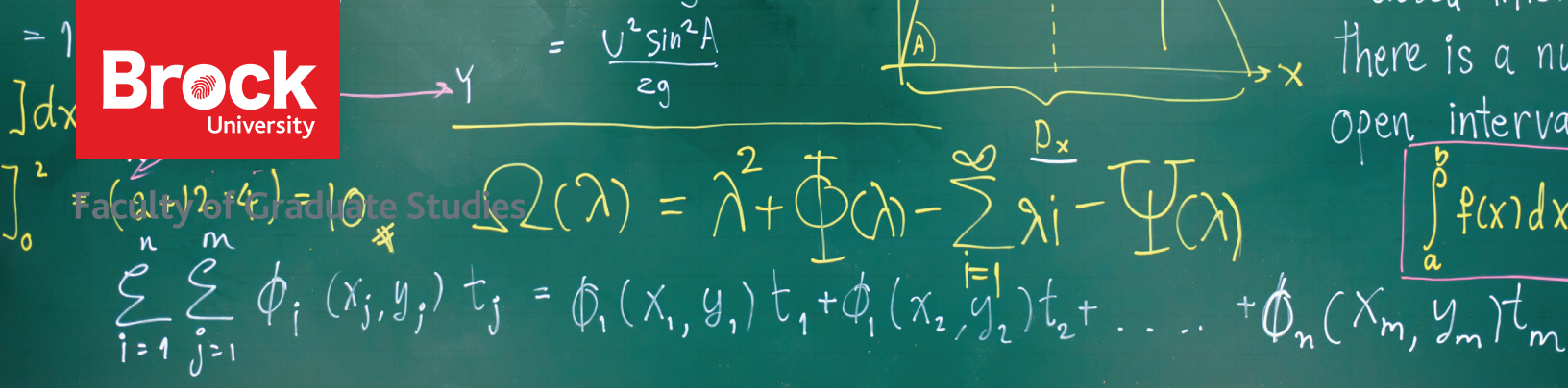
brocku.ca/graduate-studies



Master of Science in Mathematics and Statistics

CURRENT FACULTY AND RESEARCH INTERESTS:

S.E. Ahmed	statistical inference, multivariate analysis and asymptotic theory
Stephen Anco	nonlinear differential equations, integrability and solitons, mathematical physics and analysis
H. Ben-El-Mechaiekh	Nonlinear Functional Analysis and its applications to various areas of mathematics and sciences
C. Buteau	deterministic modeling of music analysis and structure and computational music analysis. Modeling motivic (melodic) structure and analysis of musical compositions through a topological approach
H. Fukś	theory and applications of spatially-extended discrete dynamical systems
M.Huang	Nonparametric statistical inference theory and methods; Extreme value theory and it's applications; Quantile regression theory and applications; Experimental design and regression theory and methods; Applied probability, stochastic models and queueing theory; Survival analysis and risk models; Probability distribution theory and limit theory; Monte Carlo simulations and resampling techniques
O. Kihel	Algebraic Number Theory, Elliptic Curves, Diophantine Equations. Permutation polynomials over Finite Fields and Galois Theory
Y. Li	groups, rings, group rings and combinatorial number theory
W. Marshall	computational statistics with applications to neuroscience
A. Odesskii	algebraic and geometric structures which come from quantum field theory, statistical mechanics and the theory of integrable systems
J. Vrbik	Celestial Mechanics – perturbed Kepler problem; Probability & Statistics – sampling distributions, Normal approximation, parameter estimation, autoregressive models; Monte Carlo techniques – applied to Quantum Chemistry; Numerical solution of integral equations – applied to Mechanical Engineering problems
T. Wolf	differential equations and integrability, computer algebra, General Relativity, Combinatorial Game Theory, Computer GO and aspects of Mathematics Education
X. Xu	Optimal regression designs; robust methods; planning and inference for accelerated life testing

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