DePAUL UNIVERSITY

MASTER OF SCIENCE IN APPLIED MATHEMATICS

PROGRAM DESCRIPTION

The Master of Science in applied mathematics is one of the few evening programs of its kind offered in the Chicago area. It is designed to provide students with the skills and knowledge they need to start their career and be successful in business, industry, or government. The program also provides a solid foundation for students interested in pursuing a PhD in applied mathematics.

Program Conentrations

The **applied and computational mathematics** concentration is intended for students seeking a career as quantitative analysts, computational scientists or applied mathematicians, or for those planning to continue the study of applied mathematics at the doctoral level. Students pursuing this concentration are exposed to a variety of mathematical methods, models and computational tools that find use in science, engineering, business, computer science and industry.

The **actuarial science** concentration caters to career changers as well as students who would like to further their actuarial training. It condenses a comprehensive actuarial curriculum into just two years, with an emphasis on the theory and problem-solving skills that are key to passing actuarial exams, and the computational methods that are sought after in the job market. Most of our graduates earn internships and full-time jobs as actuarial analysts in insurance companies and consulting firms.

The **mathematical finance** concentration is a track for mathematically inclined students who would like to pursue a quantitative or risk management career in finance. The coursework focuses on the theoretical foundations of finance as well as the concrete application of financial modeling, using sophisticated tools and techniques such as stochastic differential equations, copulas and extreme value theory. Students completing this concentration will be well equipped to work as junior traders or financial analysts.

PROGRAM BENEFITS

Outstanding faculty. All courses are taught by full-time faculty, many renowned in their field, who consider teaching their primary commitment. Our students are encouraged to interact with faculty and each other, creating a stimulating but supportive classroom environment.

Technology-based learning. Many courses utilize software packages such as Python, Maple, MATLAB, SAS and R—programs often used in places of employment—and expose students to real-life data.

Advising and job search assistance. Faculty members and the program director are available to assist and counsel students about their academic progress as well as possible career routes after graduation.

Post-graduation success. Ninety-three percent of our recent CSH graduates are employed or continuing their education in their field of study. For example, graduates have obtained excellent jobs and careers as actuarial analysts, business analysts, economists or in risk management for companies like Allstate, Blue Cross Blue Shield of Illinois, CNA, Acadia Healthcare, Deloitte, LogNormal Logisitics, Milliman, TransUnion, Willis Towers Watson, as well as the Bureau of Labor Statistics, the IRS, the State of Illinois and many other notable organizations.

Flexibility. Courses are offered in-person at the Lincoln Park Campus or online. The program can be completed in two years by taking two courses per quarter.

A STEM designated program. The Master of Science in applied mathematics is a STEM program. International students who earn degrees from STEM designated programs can qualify to extend their post-graduation stay in the U.S. for Optional Practical Training (OPT).

CURRICULUM

In order to graduate, students must complete 12 courses (48 quarter hours) consisting of required and elective courses. Additionally, students must complete two three-hour comprehensive final exams, taken during the first two weeks of September and April.

An internship and/or field experience is not required for degree completion, but is recommended for international students and students who do not hold full-time jobs. Students in the actuarial concentrations are advised to secure an internship as it is vital to successful employment (this is in addition to completion of two or more of the actuarial exams).

DEGREE REQUIREMENTS

Actuarial Science Concentration Courses (12 courses, 48 quarter hours)

Required

MAT 451	Probability and Statistics I
MAT 452	Probability and Statistics II
MAT 453	Probability and Statistics III
MAT 456	Applied Regression Analysis
MAT 461	Actuarial Science I
MAT 462	Actuarial Science II
MAT 463	Actuarial Science III
MAT 464	Loss Models I

(over)

MAT 465 Loss Models II
MAT 468 Mathematics for Finance

Choose two courses from the following:
MAT 448 Statistical Methods using SAS
MAT 455 Stochastic Processes
MAT 459 Simulation Models and Monte Carlo
MAT 460 Topics in Statistics
MAT 470 Advanced Linear Algebra
MAT 485 Numerical Analysis I
MAT 512 Applied Time Series and Forecasting

Applied and Computational Mathematics Concentration
(12 courses, 48 quarter hours)
Required courses
MAT 437 Complex Analysis
MAT 451 Probability and Statistics I
MAT 470 Advanced Linear Algebra
MAT 482 Partial Differential Equations
MAT 484 Mathematical Modeling
MAT 485 Numerical Analysis I
MAT 486 Numerical Analysis II
MAT 494 Graph Theory

Choose four electives from the following:
MAT 435 Measure Theory
MAT 436 Functional Analysis
MAT 448 Statistical Methods Using SAS
MAT 452 Probability and Statistics II
MAT 453 Probability and Statistics III
MAT 455 Stochastic Processes
MAT 459 Simulation Models and Monte Carlo
MAT 468 Mathematical Finance
MAT 469 Stochastic Calculus
MAT 471 Group Theory
MAT 481 Fourier Analysis and Special Functions
MAT 487 Operations Research I
MAT 488 Operations Research II
MAT 496 Game Theory
MAT 596 Advanced Topics in Algebra
MAT 597 Advanced Topics in Analysis

Mathematical Finance Concentration
(12 courses, 48 quarter hours)
Required
MAT 451 Probability and Statistics I
MAT 452 Probability and Statistics II
MAT 453 Probability and Statistics III
MAT 455 Stochastic Processes
MAT 456 Applied Regression Analysis
MAT 459 Simulation Models and Monte Carlo
MAT 468 Mathematical Finance
MAT 469 Stochastic Calculus
MAT 512 Applied Time Series and Forecasting
MAT 515 Financial Modeling

Choose two electives from the following:
MAT 448 Statistical Methods Using SAS
MAT 457 Nonparametric Statistics
MAT 461 Actuarial Science I
MAT 467 Credibility Theory
MAT 485 Numerical Analysis I
MAT 487 Operations Research: Linear Programming
MAT 488 Operations Research: Optimization Theory

ADMISSION REQUIREMENTS

To be eligible for the applied mathematics program, applicants must hold a bachelor's degree conferred by a regionally accredited institution.

It is expected that all applicants have completed the following minimum requirements:

- Single- and Multivariable Calculus (equivalent to MAT 150, 151, 152 and MAT 260)
- Linear Algebra (equivalent to MAT 262)
- A course in Statistics (such as MAT 348)
- A course in scientific computer programming (e.g., courses in Python, Java, C++, etc.)

In addition, Ordinary Differential Equations (equivalent to MAT 304) is required for the students in the Applied and Computational Mathematics concentration and recommended for the Mathematical Finance concentration.

Applicants who do not have this preparation may be admitted on a conditional basis and should contact the graduate program director to discuss their options.

Admission decisions are based on the following:

- A completed online application
- Official transcripts from all previous college coursework (minimum GPA of 3.0 on a 4.0 scale)
- An optional personal statement of approximately 200-300 words describing your goals and how they fit with the program is strongly encouraged.

Students educated outside of the U.S. must provide a credit evaluation and proof of English proficiency by submitting a TOEFL or IELTS score. Visit the program website or ***go.depaul.edu/cshinternational*** *for more information.*

HOW TO APPLY

Online applications can be submitted at **go.depaul.edu/apply**. Application credentials can be submitted through the online application or by email to graddepaul@depaul.edu. Additionally, official electronic transcripts can be emailed to graddepaul@depaul.edu directly by the issuing institution. Please make sure your name is on all documents.

Transcripts and other required credentials also can be mailed to:

The Office of Graduate Admission
College of Science and Health
DePaul University
2400 N. Sheffield Ave.
Chicago, IL 60614

QUESTIONS?

If you have questions about this program, please contact the program director, Dr. Ilie Ugarcovici, call (773) 325-1354 or email iugarcov@depaul.edu.

FOR MORE INFORMATION

Web: go.depaul.edu/appliedmath
Visit: go.depaul.edu/appliedevents
Email: graddepaul@depaul.edu
Phone: (773) 325-7315

Please note the information provided is current as of November 2021 and is subject to change.