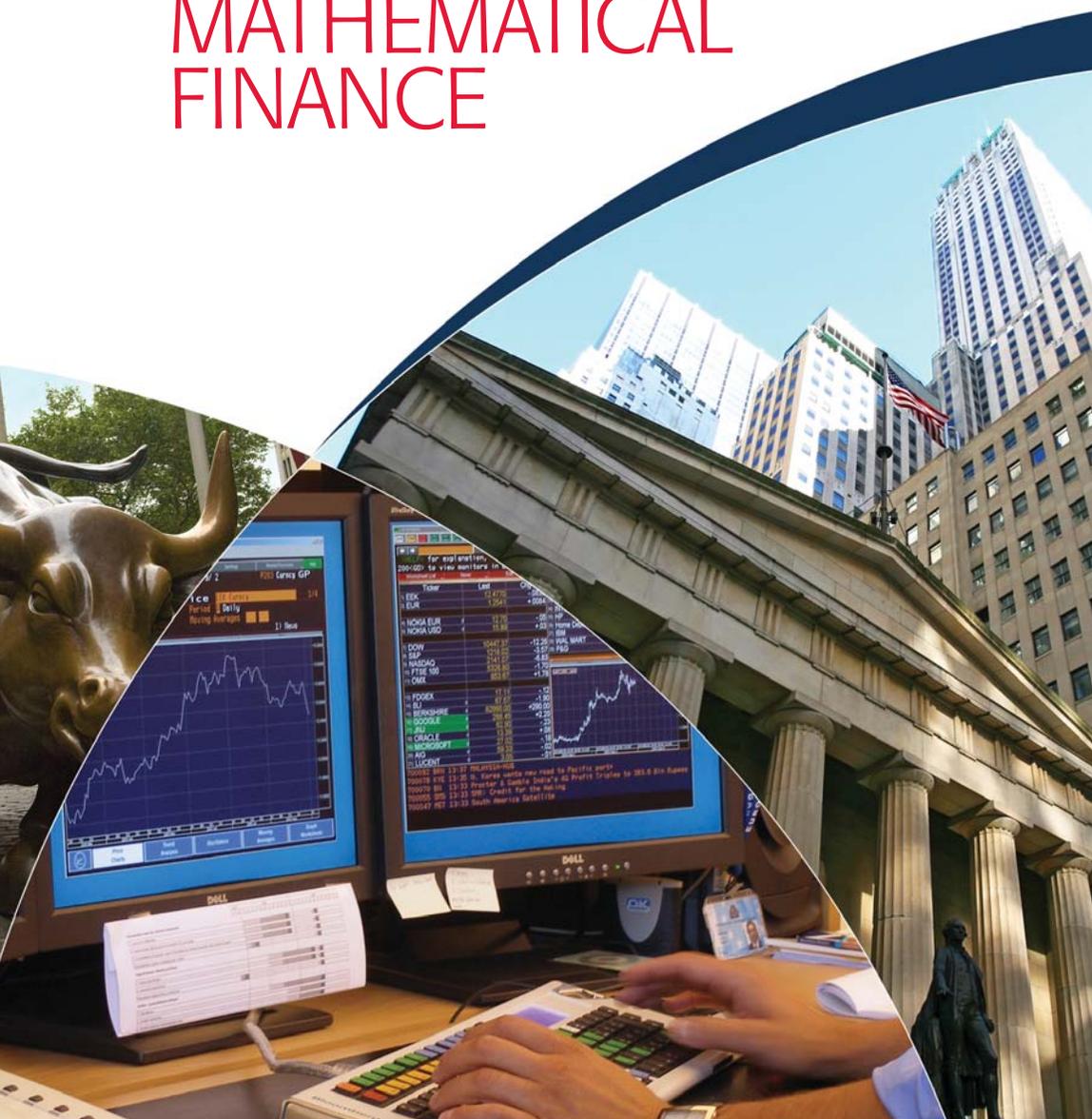# RUTGERS

Graduate School | New Brunswick

Master of Science in Mathematics

MATHEMATICAL FINANCE

A WORLD OF OPPORTUNITY

The master of science degree program in mathematical finance (MSMF) at the Graduate School–New Brunswick of Rutgers, The State University of New Jersey, trains exceptional quantitative analysts who combine the two critical skill sets so much in demand by today's financial industry— an in-depth theoretical foundation in the required mathematical, statistical, and computer sciences and a practical knowledge of the world of finance.

Graduates of the program are ready to make immediate contributions to employers at hedge fund companies, asset and risk management firms, investment banks, insurance companies, rating agencies, energy trading firms, and an expanding network of businesses that rely on advanced financial engineering methods.

MSMF graduates are prepared for a wide array of rewarding career possibilities, including:

- Derivative security modeling for equities, fixed-income securities, commodities, foreign exchange, and credit products
- Derivatives trading
- Financial data analysis
- High-performance and distributed computing in finance
- Portfolio and asset management
- Quantitative finance research
- Quantitative financial software development

Students in the program have the opportunity to learn from nationally ranked faculty across several Rutgers academic departments, as well as from leading-edge industry practitioners at top-tier financial firms.

Rutgers' MSMF program is also distinguished by the level of personal guidance provided, both in academic advising and in career services support offered to both our students and our alumni.

Top Rankings

Top 10 Quant Program

Rutgers was ranked among the top 10 quant programs in the nation by an expert panel for *Advanced Trading* magazine that evaluated which programs best prepared "quants" for the rigors of Wall Street and were most likely to land graduates a job at top firms.

Top 20 Graduate Program

Rutgers' Department of Mathematics is rated among the top 20 in the United States in the latest graduate program rankings by *U.S. News & World Report.*

ABOUT THE PROGRAM

The MSMF program consists of a combination of core and elective courses, a practical training experience within the first year, and a master's degree essay prior to graduation. The curriculum is highly interdisciplinary and is frequently updated to meet the changing needs of the financial industry. Courses are taught by an outstanding team of faculty members and expert industry practitioners.

Students may pursue the program full or part time, and courses are offered in the evening to accommodate students who work during the day at internships or full-time positions.

Core Courses

- Applied Time Series Analysis
- Mathematical Finance I & II
- Numerical Analysis I & II
- Regression Analysis

Sample Electives

- Analysis of Fixed-Income Securities
- Applied Multivariate Analysis
- Computational Finance
- Credit Risk Modeling
- High-Frequency Finance and Stochastic Control
- Interest Rate Derivatives Modeling
- Methods of Statistical Inference
- Parallel and Distributed Computing
- Portfolio Theory and Applications
- Programming Methodology for Numerical Computing and Finance (C++)
- Risk and Insurance Management
- Software Engineering

Practical Training Experience

Students are strongly encouraged to seek an internship during their first year with the help of the program's associate director for career services and employer relations. Located on Rutgers' Busch Campus in Piscataway and adjacent to New Brunswick, the program is ideally situated near the major financial centers in New York City and Connecticut. The program has excellent relationships with many outstanding employers, and an internship can be a stepping-stone to a full-time position after graduation.

The practical training experience requirement can also be fulfilled through a regular financial industry position, a quantitative finance research project, or participation in the program-sponsored seminars.

**Research Expertise
+
Practical Experience
=
Competitive Edge**

Academic and Industry Seminars

Throughout the year, the program hosts visits by industry practitioners and academic researchers in financial engineering. These presentations range from technical to career and industry introductions.

Industry speakers visit from companies such as the following:

- Bank of America
- Bloomberg L.P.
- Credit Suisse
- Deutsche Bank
- Goldman Sachs
- J.P. Morgan
- Morgan Stanley
- Standard & Poor's

Academic speakers come from prestigious universities throughout the United States, Canada, and overseas. These seminars help students to broaden their industry knowledge and to develop as professionals. The MSMF program also sponsors an annual conference on financial engineering in New Brunswick, which attracts leaders in the field from around the world.

ABOUT THE FACULTY

Faculty affiliated with the MSMF program bring a wealth of academic expertise and research experience to the classroom. Applied financial engineering research specialties of the faculty include:

- Financial modeling
- Numerical analysis
- Partial differential equations
- Probability theory
- Stochastic processes
- Statistical analysis

Equally important, the faculty include expert practitioners from firms such as BlackRock, Bloomberg L.P., J.P. Morgan, and others. This combination of faculty members ensures that students are exposed to the most advanced technical concepts *and* their practical application.

PLANNING YOUR CAREER

The MSMF program takes your career seriously. While the extensive services of the Rutgers Career Services office are at your disposal, the MSMF program employs a full-time associate director for career services and employer relations to provide guidance from your first semester onward. The program also maintains a customized online career employment database—called Quant Careers—that is exclusively designed for students and alumni of the program. It alerts students to the steady stream of industry speakers and career workshops scheduled throughout the year; contains a searchable database of employers, internships, and full-time opportunities; allows students to post resumes; and allows firms to review student and alumni portfolios and to post job opportunities exclusively for them.

Since the program's inception in fall 2006, and despite the challenging economic climate, nearly 100 percent of our graduates are employed in financial industry positions.

Full-time employers of our graduates include:

- Bank of America
- Bank of New York Mellon
- Bloomberg L.P.
- Blue Spruce Global Advisors
- Credit Suisse
- Deutsche Bank
- Ernst & Young
- Fidelity Investments
- Goldman Sachs
- J.P. Morgan
- Merck Research Laboratories
- Morgan Stanley
- Numerix
- R. G. Niederhoffer Capital Management, Inc.
- RBC Capital Markets
- Standard & Poor's
- State Street Associates, LLC
- Wachovia

"Having worked in the financial industry since 2000, I specifically chose the Rutgers MSMF program because of its heavy focus in mathematics. I wanted a program that would provide me with a solid fundamental understanding of mathematical finance as well as the rigor involved in researching and developing financial models. The benefits of the Rutgers MSMF program are a reflection of the faculty and staff. The expertise and knowledge of the faculty help prepare students for real-world problems, while the diligence of the administrative staff ensures a smooth transition into the program and into the financial industry after graduation."

**– Alvin Huang, G-2 Trading, Director of Operations
Rutgers MSMF Alumnus 2009**

ADMISSIONS

The MSMF program is highly selective. The student body includes both recent college graduates and professionals who are seeking a career change or to enhance their technical skills.

Students with strong quantitative skills and any undergraduate major are encouraged to apply. Applicants must have completed the following prerequisites:

- Programming (C, C++, C#, or Java)
- Linear algebra
- Multivariable calculus
- Ordinary differential equations
- Partial differential equations
- Probability (calculus-based)

Applications are only accepted for the fall semester. Please visit our website for our application deadline. Early submission is strongly recommended. Applicants should have taken the GRE within 5 years of the application deadline. The GRE requirement is waived for applicants who have previously completed a Ph.D. in a technical field. For a complete list of admissions requirements, go to finmath.rutgers.edu.

RUTGERS UNIVERSITY

As a university strongly committed to graduate education and research, Rutgers provides a program of exceptional academic quality taught by a distinguished faculty on an expansive, beautiful campus. Chartered in 1766, Rutgers is one of the nation's premier research institutions and a member of the Association of American Universities, a highly selective organization composed of the leading research universities in North America. More information can be found at rutgers.edu.

Location is key.

Located within an easy commute to major financial centers, including Wall Street, the Rutgers campus is an ideal base from which to launch a career in quantitative finance.

Paul M. N. Feehan, Director, Mathematical Finance Master's Program

- Associate Professor of Mathematics, Rutgers University, 2001–present
- Advisor of mathematical finance doctoral students

Industry Experience
- Vice President, Quantitative Research, J.P. Morgan
- Member, Quantitative Finance Research, Bloomberg L.P.

Education
- Ph.D., Mathematics, Columbia University, 1992
- M.A., Mathematics, University of Southern California, 1987

Current Research
- Probability and mathematical finance, including partial differential equations and stochastic processes

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FURTHER INFORMATION

For additional information about the MSMF program, visit finmath.rutgers.edu or contact us at:

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