Application to Offer an Accelerated Master's Program

Originating Department: Belk College of Business
Submitted by: Jennifer Troyer, Associate Dean for Research and Graduate Programs
Date Submitted: March 2, 2015

Program

On behalf of the Belk College of Business, we request permission to implement an Accelerated Master's Program in Mathematical Finance. Exceptional undergraduate UNC Charlotte students enrolled in the undergraduate program in Business Analytics, as noted below, may be accepted into the Master of Science in Mathematical Finance and begin work toward a graduate degree before completion of the baccalaureate degree as stipulated below.

Goal

The goal of the Accelerated Master's Program is to recruit academically talented high school and undergraduate students to graduate programs at the University, and to support them through graduation.

Mechanism

Students will begin graduate coursework in their senior year, although they will be mentored throughout the Accelerated Master's Program. The Accelerated Master's Program will allow students to complete the bachelor's degree and the master's degree in less time than pursuing them singularly, and the two degrees will be awarded simultaneously after successful completion of all program requirements. Students will only be eligible to participate in commencement ceremonies upon completing the requirements for both the bachelor's and master's degrees.

This Accelerated Master's Program may also be accelerated in which up to 12 hours earned at the graduate level may be substituted for required undergraduate hours. In other words, up to 12 hours of graduate work may be "double counted" toward both the baccalaureate and graduate degrees.

A sample of the Accelerated Master's Program curriculum for the Master of Science in Mathematical Finance program is attached.

Application and Admission Requirements

Students may express interest in the Accelerated Master's Program while enrolled in high school if they have a minimum GPA >=3.75 (on a 4.0 scale) and a minimum score of 1700 on the SAT. Students who enroll at UNC Charlotte will apply for full admission to the Program in the spring semester of their freshman year. They must submit an online application for graduate admission and the Statement of Purpose as well as three (3) recommendations in support of the application. At least one recommendation must be provided by a high school teacher and another from a UNC Charlotte faculty member who taught the applicant in the fall semester. The application and supporting documents must be submitted by March 15th of the freshman year. Enrollment will be based on program capacity, and certain programs may have more stringent admission policies or application deadlines.

Continuing Enrollment Requirements

Students must:

- Maintain a strong academic record at the undergraduate and graduate levels, respectively (Cumulative GPA >=3.0).

- Students who do not maintain the minimum GPA will be placed on probation the first semester and will be dismissed from the graduate program at the end of the second semester.
- Exhibit stellar performance in all coursework.

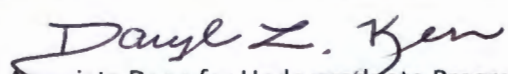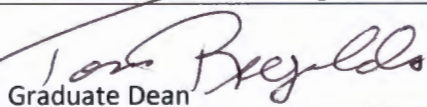## Financial Aid and Tuition

Students may:

- Be considered for undergraduate financial aid and funding prior to completion of 121 semester hours of undergraduate credit.
- Afterwards, students may be considered for graduate financial assistance.
- Students will be charged graduate tuition and fees after completion of all baccalaureate courses, generally beginning in the fifth year of study.

Support

The academic program is expected to engage students continuously throughout their undergraduate and graduate programs. Towards this end, the following advising, mentoring, research, and financial support will be provided to participants in the Accelerated Master's Program:

- Advising: The Business Advising Center advises all undergraduate students in the Belk College of Business. Advising is required upon admission to the major and recommended before registration each semester. Undergraduate Business Analytics students also have access to a specialized Academic Advisor who ensures correct progression of the undergraduate degree. Upon beginning graduate coursework, students will receive advising from the MS Mathematical Finance Graduate Program Director. Additionally, each student will complete a graduate program of study and receive advising related their plan of study.
- Mentoring: Students receive mentoring from the specialized Academic Advisor dedicated to undergraduate students majoring in Business Analytics, undergraduate and graduate faculty, and the graduate program director throughout the program. Students also have access to the University Career Center and receive career coaching from both the Belk College of Business and the University.
- Research: Students engage in research throughout their undergraduate and graduate career and may collaborate with faculty to conduct research. Additionally the Department of Finance hosts a monthly seminar series featuring top academic and business leaders addressing critical issues. Students are invited to attend these lectures and learn about the latest research in the field.
- Financial: Students may be considered for undergraduate financial aid funding prior to completion of 121 semester hours of undergraduate credit; afterwards, students may be considered for graduate financial assistance. A limited number of graduate assistantships are available each year for full-time MS Math Finance students. Admitted students are considered automatically and awards are made on a competitive basis.

Program Approval

Date Received	Date Considered	Date Forwarded	Action	Signature
2/25/15	2/26/15	3/2/15	Approved	MS Mathematical Finance Graduate Program Director
3/2/15	3/2/15	3/2/15	APPROVED	Daryl Z. Ken Associate Dean for Undergraduate Programs
	5/4/15		Approved	Graduate Dean

Application Submission

Please submit this Accelerated Master's Program application to: Dr. Thomas Reynolds, Dean of the Graduate School, 210 Cato Hall.

Sample Accelerated Master's in Mathematical Finance Curriculum

The University of North Carolina at Charlotte will offer an integrated five-year Bachelor of Science in Business Administration with a Business Analytics major and Master of Science in Mathematical Finance program for exceptional Belk College of Business students.

Degree Requirements

The Master of Science in Mathematical Finance degree requires a minimum of 30 hours of graduate credit. Students must complete the required six Program Core courses and four Concentration courses corresponding with the selected concentration.

Students accepted into the Accelerated M.S. in Mathematical Finance program will typically complete 15 undergraduate credit hours during their fall semester of their senior year. Students will typically complete 12 graduate credit hours during their spring semester of their senior year which will count towards both their baccalaureate and graduate degrees. Students will complete 9-12 graduate credit hours each semester of their fifth year to complete their graduate degree.

Program Core Courses

- ECON/FINN 6203 Financial Economic Theory (3)
- ECON/STAT 6113 Cross-Section and Time Series Econometrics (3)
- FINN/ECON 6219 Financial Econometrics (3)
- FINN 6210 Financial Elements of Derivatives (3)
- FINN 6211 Fixed Income Securities and Credit Risk (3)
- MATH 6203 Stochastic Calculus for Finance (3)

Concentrations

The degree program offers three concentrations leading to a M.S. in Mathematical Finance. Students who plan to pursue careers in quantitative modeling and pricing analysis are encouraged to elect the Computational Finance Concentration. Students planning to pursue a career in risk management and insurance are encouraged to pursue the program with the Risk Management Concentration. Students interested in a career in financial data analysis and applications are encouraged to elect the Financial Data Analytics concentration.

1. Concentration in Computational Finance

In addition to the six Program Core courses, the following four courses are required for a M.S. in Mathematical Finance with a Concentration in Computational Finance.

- MATH 6204 Numerical Methods for Financial Derivatives (3)
- MATH 6205 Financial Computing (3)
- MATH 6206 Stochastic Calculus for Finance II (3)
- FINN 6212 Advanced Financial Derivatives (3)

2. Concentration in Risk Management

In addition to the six Program Core courses, the following four courses are required for a M.S. in Mathematical Finance with a Concentration in Risk Management.

- FINN 6213 Risk Management and Financial Institutions (3)
- FINN 6214 Asset and Portfolio Management (3)
- FINN 6215 Risk Management in Insurance Companies (3)
- FINN 6216 Quantitative Risk Management (3)

3. Concentration in Financial Data Analytics

In addition to the six Program Core courses, the following four courses are required for a M.S. in Mathematical Finance with a Concentration in Financial Data Analytics.

- ECON 6217 Advanced Microeconometrics (3)
- ITCS 6114 Algorithm and Data Structures (3)
- ITCS 6160 Database Systems (3) OR ITIS 5160 Applied Databases
- MBAD 6201 Business Intelligence and Analytics (3)

Sample Program of Study: B.S.B.A. with Major in Business Analytics, M.S. in Mathematical Finance with Financial Data Analytics Concentration

Freshman Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
Fall Semester					
UWRT 1101	Writing and Inquiry in Academic Contexts I	3	X		
MATH 1241	Calculus I	3	X		Math/programming core
LBST 11xx	LBST 1100 Series: Arts and Society	3	X		
ITCS 2116	C Programming	3			Math/programming core
BUSN 1101	Introduction to Business & Professional Development	3			Progression course
Spring Semester					
XXXX XXXX	Natural Science w/Lab	4	X		
MATH 1242	Calculus II	3			Math/programming core
STAT 1220	Elements of Statistics I	3	X		Progression course
LBST 2101	Western Cultural and Historical Awareness	3	X		
UWRT 1102	Writing and Inquiry in Academic Contexts II	3	X		

31 credit hours for year

Sophomore Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
Fall Semester					
MATH 2164	Matrices and Linear Algebra	3			Math/programming core
ACCT 2121	Principles of Accounting I	3			Progression course
ECON 2101	Principles of Economics – Macro (Honors)	3	X		Progression course
BUSA 2130	Business Computing	3			Math/programming core
XXXX XXXX	Writing Intensive Course	3	X	W	
BUSA 3090	Topics in Business Analytics	2			Major course
Spring Semester					
XXXX XXXX	Natural Science	3	X		
ACCT 2122	Principles of Accounting II	3			Progression course
MATH 2241	Calculus III	3			Math/programming core
ECON 2102	Principles of Economics – Micro (Honors)	3			Progression course
LBST 2102	Global and Intercultural Connections	3	X		

32 credit hours for year

Junior Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
Fall Semester					
BLAW 3150	Business Law I	3			
MATH 3122 / STAT 3122	Probability and Statistics I	3			Math/programming core
MGMT 3140	Management and Organizational Behavior	3			
MKTG 3110	Marketing Concepts	3			
ECON 3112	Econometrics	3			Major course
Spring Semester					
LBST 22xx	LBST 2200 Series: Ethical Issues and Cultural Critique	3	X		
COMM 3160	Business Communications	3	X	W, O	
OPER 3100	Operations Management	3			
BUSA 3120	Financial Management with a Quantitative Focus	3			Major course
INFO 3236	Business Analytics	3			Major course

30 credit hours for year

Senior Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
Fall Semester					
BUSA 3124	Intermediate Microeconomic and Macroeconomic Theory	3			Major course
BUSA 3122	Investments with a Quantitative Focus	3			Major course
BUSA 3233	Data and Information Management	3			Major course
BUSA 3288	Competitive Advantage with Marketing Analytics	3			Major course
XXXX XXXX	Undergraduate General Elective	3			
Spring Semester					
ECON/FINN 6203	Financial Economic Theory	3			Program core course
FINN/ECON 6219	Financial Econometrics	3			Program core course
FINN 6210	Financial Elements of Derivatives	3			Program core course
XXXX XXXX	Graduate elective	3			

27 credit hours for year

5th Year					
Course Number	Course Title	Credit Hours	General Education	W/O Course	Notes
Fall Semester					
STAT/ECON 6113	Cross-Section and Time Series Econometrics	3			Program core course
FINN 6211	Fixed Income Securities and Credit Risk	3			Program core course
MATH 6203	Scholastic Calculus for Finance	3			Program core course
MBAD 6201	Business Intelligence and Analytics	3			Concentration course
Spring Semester					
ECON 6217	Advanced Microeconomics	3			Concentration course
ITCS 6114	Algorithm and Data Structures	3			Concentration course
ITCS 6160	Database Systems	3			Concentration course
XXXX XXXX	Graduate elective	3			

24 credit hours for year