

UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

- New Instructional Program
- Substantial Expansion/Major Modification
- Cooperative Degree Program
- Within Existing Resources, or
- Requiring New Resources

University of Maryland College Park

Institution Submitting Proposal

Quantitative Finance

Title of Proposed Program

Master of Quantitative Finance

Fall 2017

Award to be Offered

Projected Implementation Date

27.0305

Proposed HEGIS Code

Proposed CIP Code

Robert H. Smith School of Business

Michael Faulkender

Department in which program will be located

Department Contact

301-405-1064

mfaulken@rhsmith.umd.edu

Contact Phone Number

Contact E-Mail Address



Signature of President or Designee

12/21/2016

Date

### **A. Centrality to the University's Mission and Planning Priorities;**

As the flagship campus of the University System of Maryland, and the original 1862 land-grant institution in the State, the University of Maryland, College Park (UMD) has a mission to provide excellent teaching, research, and service to nourish a climate of intellectual growth and provide outstanding instruction in a broad range of academic disciplines and interdisciplinary fields. UMD has as a primary goal to provide knowledge-based programs and services that are responsive to the needs of the citizens across the state and throughout the nation. In response to this call, the Robert H. Smith School of Business proposes to offer a new Master of Quantitative Finance. The Masters in Quantitative Finance degree (MQF) is a professional degree for students wishing to pursue careers in money management, financial research, risk management, and financial market regulation. Core courses provide excellent fundamentals in the economic, statistical, and mathematical models used in the finance industry, and elective courses will allow students the flexibility to become specialists within these career paths. This program addresses a growing need in the finance industry for professionals with sophisticated quantitative and computational skills needed for areas such as securities pricing, institutional risk management, and hedge fund management. The university currently offers a Master of Finance degree, which will continue to be offered. The Master of Finance, which trains students interested in corporate finance and investment banking, is not sufficient for students interested in working in hedge funds or corporate risk management, which require significantly more mathematical and statistical modeling skills.

### **B. Adequacy of Curriculum Design and Delivery**

The proposed program will require 36 credits composed of required courses and electives. Required courses include the following: BUSI640 Financial Management (2 Credits); BUFN650 Financial Mathematics (2 Credits); BUFN741 Advanced Capital Markets (2 Credits); BUFN745 Financial Programming (2 Credits); BUFN750 Valuation in Corporate Finance (2 Credits); BUFN758N and 758O Financial Econometrics I & II (2 Credits); and BUFN761 Derivative Securities (2 Credits). (See Appendix A for a list of courses.) The elective courses (20 credits) will be offered in fields related to Asset Management, Advanced Mathematical Finance, Risk Management, Corporate Finance, and other areas in Finance. With the approval of the academic advisor, students may also choose up to 8 electives in related fields.

### **Educational Objectives**

The proposed program will provide students with the following:

- a) Comprehensive knowledge of foundational financial concepts, products, and financial market structure necessary for engaging in any form of analytical financial analysis;
- b) In-depth understanding of the mathematical models that are widely used in pricing financial securities;
- c) The statistical models used to parameterize these mathematical models;
- d) Analytical skills including detailed financial modeling, the ability to design and empirically estimate financial relationships, and simulation methods to understand risk and return tradeoffs;
- e) Knowledge of the legal and ethical issues related to financial management and an understanding of the role of all stakeholders when capital allocation decisions are made;

- f) An understanding of the regulatory structure of financial markets and the role that policymakers and regulators play in the efficient operation of financial markets;
- g) Skills that will endure beyond the next business cycle and that facilitate institutional sustainability, even during times of economic downturn; and
- h) Expertise in financial management that will make our students valuable contributors to a variety of employers and organizations in diverse communities.

**Student Learning Outcomes:**

**Learning Outcome 1: Knowledge of Business Functional Areas.** *Graduate students understand key principles underlying the functional areas of finance.*

- Rigorously model time value of money analyses and determine capital structure
- Use mathematical and statistical models to characterize capital markets
- Value financial securities
- Analyze derivatives markets

**Learning Outcome 2: Integrative Knowledge.** *Graduate students apply learned concepts*

- Apply accounting concepts to discounted cash flow models
- Apply concepts in Economics to defend valuation analyses

**Learning Outcome 3: Analytical Thinking.** *Graduate students evaluate and articulate investment strategy and opportunities*

- Evaluate investment opportunities using computational methods and simulations
- Articulate economic trade-offs for investors in financial securities

**Learning Outcome 4: Statistical Proficiency.** *Graduate students demonstrate statistical knowledge through interpreting financial models*

- Apply statistical methods to financial decision making
- Use economic techniques to parameterize financial models

See Section L of this proposal for the program assessment plan.

**C. Critical and Compelling Statewide Need;**

As the Maryland State Plan for Postsecondary Education states, “In order to maintain and improve quality and effectiveness, institutions and their leaders must have the flexibility and resilience to address the changing needs of the State and its citizens.”<sup>1</sup> In the wake of the global financial crisis, employers are looking for finance specialists who have a thorough understanding of how to mathematically model financial products. Proper risk management conducted by financial institutions requires understanding the factors that will alter prices and the dynamics of the markets in which those securities trade. Hedge fund management is entirely about modeling the movements of securities and forming portfolios to trade on those movements in ways that mitigate risk but still generate trading profits. Both of these actions require sophisticated understanding of mathematical and statistical models that have been applied to financial products and markets.

<sup>1</sup> Maryland Higher Education Commission. *Maryland Ready: 2013-2017 Maryland State Plan for Postsecondary Education*. (P. 18). Retrieved from [http://mhec.maryland.gov/Documents/MHECStatePlan\\_2014.pdf](http://mhec.maryland.gov/Documents/MHECStatePlan_2014.pdf).

#### **D. Market Supply and Demand;**

Generally speaking, careers in finance are projected to increase at both national and state levels. The United States Bureau of Labor Statistics predicts that jobs in finance in the United States will grow by the tens of thousands by 2024. Financial Analyst positions will increase by 32,300<sup>2</sup>. Financial Manager positions will increase by 37,700<sup>3</sup>. At the state level, the Maryland Department of Labor, Licensing & Regulation predicts an increase of 1,874 Financial Analyst positions and 2,162 Financial Managers for the state by 2024<sup>4</sup>. UMD, which currently offers a Master of Science in Finance, has experienced high demand for the degree. For the 2015-2016 academic year, the program received 1,128 applications and had 129 students register in the Master of Finance program. For the 2014-2015 academic year, the program received 1,380 applications. According to a 2016 survey conducted at <http://www.mba.com> by the Graduate Management Admission Council (GMAC, the organization that administers the GMAT test), more than 20% of more than 10,000 prospective-student survey respondents indicated an interest in a quantitative master of finance program.

As these statistics demonstrate, there is great demand for degrees in finance but the market is becoming more competitive. Business schools are undergoing a significant shift in the applicant pool for Master's degree programs. Applications for traditional MBA programs that provide a general management focus have seen a sustained reduction nationwide. Contemporaneously, more students are seeking Master's degrees that specialize in a particular business field, particularly finance and accounting.

Within finance, we are seeing more specialization. For instance, Washington University in St. Louis offers both a Master of Science in Finance as well as a Master of Science in Quantitative Finance. MIT likewise recently launched a more quantitative Masters program in finance. Georgetown University recently launched an online Master of Finance program. Schools such as Fordham University, and fellow Big Ten institutions Rutgers University and the University of Minnesota, currently or are about to offer Master's degrees in Quantitative Finance (CIP code 27.0305). In the most recent admissions cycle, five students declined the offer of admission to UMD's Master of Finance program so that they could instead attend the Quantitative Finance program at Fordham University. As the field of finance becomes more specialized, we are seeking to broaden our portfolio of finance degrees to include one specifically targeted at those particularly interested in the more quantitative components of finance. We anticipate that approximately 60 students per year would enter this program, with more than 90% of the students completing their degree program within two years.

#### **E. Reasonableness of Program Duplication, if any;**

There is only one other program offered in the state of Maryland that is focused on quantitative finance, and that is Johns Hopkins' Financial Mathematics program. That program is administered by their Applied Math and their Engineering schools and in 2016 had a total of 42 graduates. The proposed UMD program will be administered by the Finance area of the

---

<sup>2</sup> US Bureau of Labor Statistics. (December 17, 2015). *Occupational Outlook Handbook: Financial Analysts*. Retrieved from: <http://www.bls.gov/ooh/business-and-financial/financial-analysts.htm>.

<sup>3</sup> US Bureau of Labor Statistics. (December 17, 2015). *Occupational Outlook Handbook: Financial Managers*. Retrieved from: <http://www.bls.gov/ooh/management/financial-managers.htm>.

<sup>4</sup> Maryland Department of Labor, Licensing & Regulation. (October 31, 2016). *Maryland Occupational Projections – 2014-2024 – Workforce Information and Performance*. Retrieved from <http://www.dllr.state.md.us/lmi/liandoproj/maryland.shtml>.

business school, blending both the mathematical, statistical, and programming components of finance with the real-world applications that a top academic finance group can bring. The Johns Hopkins' program and UMD's proposed program are similar in content, although UMD's program will be offered by the Smith Business School and as a result may have more of a business perspective. Regardless, as the current UMD Finance program's application numbers and the GMAC survey numbers in section D indicate, demand for programs in Finance numbers in the thousands per year. The launch of this program will not cannibalize the Hopkins Financial Mathematics program. The demand in programs that focus on sophisticated quantitative and computational finance skills, fueled by industry demand, will only increase, and can surely support two programs within the state of Maryland.

**F. Relevance to Historically Black Institutions;**

No such program currently exists at any of Maryland's Historically Black Institutions (HBI's). UMD's Robert H. Smith School of Business is already a nationally-recognized leader in business graduate programs and offers a number of master-level programs in business, including a Master of Business Administration, a Master of Finance, and Master of Science programs in Business in Business and Management, Accounting, Business Analytics, Marketing Analytics, Supply Chain Management, and Information Systems. Accordingly, we do not believe that an additional program offered by the Smith School would impact on the uniqueness or institutional identity of any Maryland HBI.

**G. Distance Education Program;**

This program will not be a distance-education program.

**H. Adequacy of Faculty Resources;**

Faculty will be drawn from the Robert H. Smith School of Business. Biographies of the faculty expected to be teaching in the program are included in Appendix B.

**I. Adequacy of Library Resources;**

The University of Maryland Libraries has conducted an assessment of library resources required for this program. The assessment concluded that the University Libraries are able to meet, with its current resources, the curricular and research needs of the program.

**J. Adequacy of Physical Facilities, Infrastructure, and Instructional Resources;**

Delivery of this program will require some additional classroom utilization in existing buildings. Classes will be folded into our regular scheduling process. Some coursework requires a computer lab and computational resources, but these are available within the current capabilities of the campus.

**K. Adequacy of financial resources;**

Program expenditures will be accommodated by tuition revenue and with modest reallocation of the instructional budget of the Robert H. Smith School of Business. It is anticipated that enrollment in the program will come from a mix of new students to the university and some who will choose this program instead of the existing Master of Finance. The tables provide an estimate of the anticipated enrollments from each category, and show the tuition revenue associated with this specific program balanced against the expected faculty, personnel, and services required for its delivery. For budgeting purposes, inflation factors of 3% on both tuition and salaries are assumed.

Items 2-5 in the expenditures tables are based on experience with other Master's degree programs within the Smith School. Student services expenses include a two-week orientation program, workshops for skills development, and expenditures on graduation ceremonies. Career services include workshops, coaching, and support for development of career placement opportunities. Student Aid is an anticipated need because of the increased number of credits (36) in this program relative to the other master's programs (30 credits) offered by the Smith School.

#### **L. Adequacy of Program evaluation;**

For all learning objectives, the measures, criterion and method of assessment are:

- Measure: Students will be required to pass a set of questions delivered as part of the final exam in each core course.
- Criterion: At least 90% of students will receive an average rating of "Meets Standards" or better on the core course final exam questions. The Academic Director will meet with students rated below "Meets Standards" to help improve their performance or determine their continued participation in the program.
- Assessment: Every Year, starting in the 2017-2018 academic year.

Formal program review is carried out according to the University of Maryland's policy for Periodic Review of Academic Units, which includes a review of the academic programs offered by, and the research and administration of, the academic unit (<http://www.president.umd.edu/policies/2014-i-600a.html>). Program Review is also monitored following the guidelines of the campus-wide cycle of Learning Outcomes Assessment (<https://www.irpa.umd.edu/Assessment/LOA.html>). Faculty within the department are reviewed according to the University's Policy on Periodic Evaluation of Faculty Performance (<http://www.president.umd.edu/policies/2014-ii-120a.html>). Since 2005, the University has used an online course evaluation instrument that standardizes course evaluations across campus. The course evaluation has standard, university-wide questions and also allows for supplemental, specialized questions from the academic unit offering the course.

#### **M. Consistency with Minority Student Achievement goals;**

The Robert H. Smith School of Business community is multifaceted at every level – students, staff and faculty represent a diverse blend of backgrounds, nationalities, ethnicities and experiences. About a dozen Smith School and student clubs are focused on bringing members together who have similar interests in gender, nationality, religion, and sexual orientation.

Current efforts include a wide range of recruiting efforts, including visits to academic program fairs, use of social media, visits to U.S. colleges and universities, presentations at professional conferences, and participation in Graduate Business Education events targeted for populations typically underrepresented in graduate business programs, particularly U.S. minorities and women. Future efforts will include targeted recruiting towards military families and veterans, highlighting of alumni and current graduate students who reflect a more diverse population. The School also engages in recruiting and outreach events across the globe to generate a diverse student body.

#### **N. Relationship to Low Productivity Programs;**

N/A

## Estimated Resources and Expenditures

Resources Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Reallocated Funds	None	None	None	None	None
2. Tuition/Fee Revenue (a x d below)	\$1,153,500	\$1,188,105	\$1,223,748	\$1,260,461	\$1,298,274
a. FT Students - migrations from MF	70	70	70	70	70
New FT MQF students	30	30	30	30	30
b. Credit Hour Rate	\$1,538	\$1,584	\$1,632	\$1,681	\$1,731
c. Annual Credit Hours for migrations	3	3	3	3	3
Annual Credit Hours - new MQF students	18	18	18	18	18
d. Annual Fee Rate for migrations	\$4,614	\$4,752	\$4,895	\$5,042	\$5,193
Annual fee for new MQF students	\$27,684	\$28,515	\$29,370	\$30,251	\$31,159
3. Grants, Contracts, & Other External Sources	None	None	None	None	None
4. Other Sources	None	None	None	None	None
<b>TOTAL (Add 1 - 4)</b>	<b>\$1,153,500</b>	<b>\$1,188,105</b>	<b>\$1,223,748</b>	<b>\$1,260,461</b>	<b>\$1,298,274</b>

Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Total Faculty (b+c below)	\$385,700	\$397,271	\$409,189	\$421,465	\$434,109
a. #FTE	2	2	2	2	2
b. Total Salary	\$290,000	\$298,700	\$307,661	\$316,891	\$326,398
c. Total Benefits	\$95,700	\$98,571	\$101,528	\$104,574	\$107,711
2. Total Administrative (b+c below)	\$133,000	\$136,990	\$141,100	\$145,333	\$149,693
a. #FTE	1	1	1	1	1
b. Total Salary	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
c. Total Benefits	\$33,000	\$33,990	\$35,010	\$36,060	\$37,142
3. Total Support Staff (b+c below)	\$133,000	\$136,990	\$141,100	\$145,333	\$149,693
a. #FTE	1	1	1	1	1
b. Total Salary	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
c. Total Benefits	\$33,000	\$33,990	\$35,010	\$36,060	\$37,142
4. New or Renovated Space	\$0	\$0	\$0	\$0	\$0
5. Student Services	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
6. Marketing	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
7. Recruiting & Admissions	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
8. Career Services	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
9. Student Aid	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
10. Other Expenses	\$0	\$0	\$0	\$0	\$0
<b>TOTAL (Add 1 - 10)</b>	<b>\$1,036,700</b>	<b>\$1,056,251</b>	<b>\$1,076,389</b>	<b>\$1,097,130</b>	<b>\$1,118,494</b>

## Appendix A: Master of Quantitative Finance -- Course Descriptions

### Core Courses

Course descriptions are provided below. All core courses are currently 2 credits.

**BUSI 640 Financial Management:** The course outlines the financial concepts and mathematical techniques used to evaluate corporate decisions. The topics include the time value of money, valuation of common securities, discounted cash flow, estimating opportunity costs of capital, and capital structure. The objectives are to introduce the language and structure of finance and to develop the tools to analyze financial decisions.

**BUFN 650 Financial Mathematics:** Introduction to the mathematical models used in finance and economics with emphasis on pricing derivative instruments. Topics include elements from basic probability theory, distributions of stock returns, elementary stochastic calculus, Ito's Lemma, arbitrage pricing theory, and continuous time portfolio theory. Particular focus is on the financial applications of these mathematical concepts.

**BUFN741 Advanced Capital Markets:** Building upon the financial mathematics course, this class provides an introduction to the mathematical and statistical models used to price securities and analyze financial markets. Topics include portfolio theory, asset pricing, market efficiency, fixed income, options and futures.

**BUFN 745 Financial Programming:** Building upon the statistical programming foundations in Econometrics, this course introduces students to advanced programming in Matlab, SAS, R, and Python with specific applications to financial modeling. Applications potentially include estimating interest rate models, developing derivatives pricing models, back-testing financial strategies using large datasets, and scraping of financial data off the internet. In addition, students will gain competency in financial platforms such as those provided by Bloomberg.

**BUFN 750 Valuation in Corporate Finance:** This is an advanced topics course in quantitative corporate finance focusing on valuation. The main objective is to apply the concepts covered in the introductory finance class through real-life applications (cases). The topics include building Pro Forma statements and forecasting future cash flows, dynamic cash flow models, estimating the cost of capital, implementing the Weighted Average Cost of Capital (WACC) and Adjusted Present Value (APV) methods, and using real options techniques (binomial and Black and Scholes models as well as Monte Carlo simulations) to value companies and projects.

**BUFN 758N and 758O Financial Econometrics I/II:** Introduces the skills and computing languages for analyzing financial data and testing financial models. The course includes linear optimization for use in factor models, the statistical properties of asset returns, event studies, time series analysis and models of stochastic volatility. The course will include theory mixed with several finance applications in widely used statistical languages.

**BUFN 761 Derivative Securities:** Introduces options and futures contracts, and the mathematical foundations of their valuation. Topics include binomial model, Black-Scholes model, delta hedging, and convexity. Derivative securities on various underlying assets (equities, indices, commodities, foreign exchange, etc.) are analyzed, using different application contexts.



## **Elective Courses**

All BUFN courses listed below are 2 credit courses. In addition to these finance electives and upon approval of the academic advisor, students may take up to eight credits in related fields, including those referenced below. Elective courses within finance are listed by topic:

### **Asset Management**

**BUFN 760 Applied Equity Analysis:** Applies financial models and statistical tools to the analysis and valuation of equity securities. In addition to focusing on economic (DCF based) analysis of corporations, the course covers topics such as the EIC (Economy/Industry/Company) framework, financial statement analysis, relative value analysis, and contingent value analysis. Students will apply statistical tools to value stocks and provide stock recommendations.

**BUFN 762 Fixed Income Analysis:** Focuses on economic and mathematical models of financial instruments whose market values are tied to interest rate movements. Develops tools such as discount functions, duration, convexity, and immunization to analyze the interest rate sensitivity and value of fixed income securities and portfolios. A variety of fixed income securities are examined, particularly zero coupon and coupon bearing bonds.

**BUFN 763 Portfolio Management:** Examines the theory and application of portfolio management techniques in detail, including the use of various asset classes in constructing efficient portfolios. Various risk and performance measurements for portfolios are examined, drawing on classic portfolio theory, as well as more recent index and factor models. The course develops tools for quantitative portfolio management, including computation and simulation methods.

**BUFN 764 Quantitative Investment Strategies:** Provides an advanced treatment of asset allocation strategies and performance evaluation. Quantitative techniques are applied to examine equity and fixed-income portfolio management strategies. The course provides a deeper understanding of the measurement of risk and its relationship to return, as well as of multi-factor models. Implementation issues, including statistical estimation, back-testing and portfolio construction, are covered, as are strategic versus tactical asset allocation, and performance evaluation.

**BUFN 773 Institutional Asset Management:** Examines how money is managed by organizations such as university endowments, pension funds, mutual funds, hedge funds, and private equity funds. Emphasizes the incentives professional money managers face within the context of the organizational structure in which they operate. Particular attention will be paid to compensation structures and monitoring mechanisms.

**BUFN 774 Market Microstructure:** The course examines---from theoretical, institutional, and empirical perspectives---how prices in speculative markets are determined by the interaction of traders. Topics covered include market making, informed trading strategies, liquidity, bid-ask spreads, transactions costs, market impact, price manipulation, and high-frequency trading. The course examines markets for equities, bonds, commodities, and foreign exchange. There are several empirical exercises using transactions data.

## Advanced Mathematical Finance

**BUFN 765 Fixed Income Derivatives:** Introduces the use and valuation of fixed income assets such as exchange-traded bond futures and options, forward contracts on interest rates, fixed and floating rate bonds with embedded options, floating rate notes, caps, collars, floors, interest rate swaps, and mortgage backed securities. Tools include the application of binomial option pricing trees, and the analysis of stochastic yield curves.

**BUFN 766 Financial Engineering:** Introduces and applies various computational techniques useful in the management of equity and fixed income portfolios and the valuation of financial derivatives and fixed income securities. Techniques include Monte Carlo Simulation and binomial/lattice pricing models. Emphasis is on bridging theory with the design of algorithms and models that can be directly applied in practice.

**BUFN 767 Applied Conic Finance:** This advanced course applies conic theory to the field of finance including applications such as portfolio theory, dynamic hedging, structured products, derivatives and construction of dynamic trading strategies.

## Risk Management

**BUFN 754 Corporate Risk Management:** Explores the theory and practice of financial risk identification, modeling, statistical measurement, and mitigation of risk at financial and non-financial firms. Topics include hedging with options and futures, interest rate risk management, Value-at-Risk (VaR), Cashflow-at-Risk (CaR), Earnings-at-risk (EaR), credit risk, equity risk, commodities risk, exchange rate risk, and lessons from risk management disasters.

**BUFN 772 Bank Management:** Examines the economic role and regulation of banks and other financial institutions, and the structure of assets, liabilities and capital in these institutions. Tools are presented to analyze the various risks faced by banks, including interest rate risk, market risk, operational risk and off-balance sheet risk. Topics also include liquidity risk, liability risk, reserve management, deposit insurance, and capital requirements.

**BUFN 758R Special Topics in Finance: Financial Risk Management:** This course surveys the theory and practice of financial risk management focusing on identification, measurement, and mitigation of risks associated with financial institutions. It focuses on the risk of a stylized large systemically important financial institution (Sifi Bank) using synthetic transactions and portfolios allowing the student to directly apply various concepts using a variety of models and Excel/VBA tools to test their sensitivity to important changes in assumptions.

## Corporate Finance

**BUFN 751 Financial Strategy for Corporations:** An advanced course in corporate finance, focusing on the issues that firms face when they plan to raise external capital from financial markets. The focus is on the financing problems faced by mid-market to large firms and on capital raised from public markets. The forms of external finance vary from simple debt or equity to more complex securities that bundle with an element of risk management.

**BUFN 752 Financial Restructuring:** Examines alternative ways to increase firm value through corporate restructuring, including domestic and international acquisitions, spin-offs, carve-outs, and leveraged buy-outs. Focus is on theory, practice, and empirical evidence related to each of these forms of restructuring, and emphasis is placed on mathematical models use to conduct valuation analysis and evaluate strategic considerations.

**BUFN 753 Corporate Governance:** Examines corporate governance and its impact on shareholder value. Topics include conceptual foundation for corporate governance, the role and duties of the board of directors, indicators of board effectiveness and best practices, design features of executive compensation contracts, the significance and prevalence of stock options, the perverse incentives of stock options and controversy over compensation practices, corporate governance failures and anatomy of corporate scandals, the essentials of the Sarbanes-Oxley Act, Dodd-Frank, and other regulatory reforms.

**BUFN 755 Entrepreneurial Finance and Private Equity:** Explores advanced topics in corporate finance, with major emphasis on how financiers help firms plan for growth and develop finance strategies firms use for different types of securities at different points in the industry's and firm's life. Securities will include private financing and placements, Venture Capital (VC), Initial Public Offerings (IPOs), Private Equity and Leveraged Buyouts.

#### **Other Finance Courses**

**BUFN 770 International Investment:** Addresses exchange rates, international interest rates, exchange rate derivatives (such as forwards, futures, swaps, and options), and international stock markets. Applications may include dynamic exchange rate hedging, and portfolio optimization under country constraints.

**BUFN 771 International Corporate and Project Finance:** Focuses on the role of financial management in the multinational firm, and the financing and management of international projects. Topics include international capital budgeting, global cost of capital, project financing, and the measurement and management of exchange rate exposure by corporations.

**BUFN 758X Special Topics in Finance: Experiential Learning Project:** These courses allow students to work under the direction of a faculty member on applied projects done in partnership with outside organizations and corporations. Recent partners include Freddie Mac, Danaher, the World Bank, FINRA, and the Securities and Exchange Commission.

## Appendix B: Master of Science in Business Analytics -- Faculty Credentials

All of the faculty listed below are full-time faculty. It is anticipated that nearly all of the courses in this degree program will be taught by full-time faculty. For information on faculty titles at the University of Maryland, please see UMD's [Policy and Procedures on Appointment, Promotion, and Tenure of Faculty](#).

Alex Triantis, PhD, Professor of Finance and Dean

Teaching / research focus: corporate finance, risk management, real options

Course: BUSI 640 Financial Management

Michael Faulkender, PhD, Associate Professor of Finance and Associate Dean of Masters Programs

Teaching / research focus: empirical corporate finance, risk management, executive compensation

Course: BUFN 751 Financial Strategy For Corporations

Vojislav Maksimovic, PhD, Dean's Chair Professor of Finance and Area Chair

Teaching / research focus: corporate finance, industrial organization, international finance

Course: BUFN 752: Corporate Restructuring

Mark Taranto, PhD, Associate Clinical Professor and MFin Academic Director

Teaching / research focus: empirical corporate finance

Courses: BUFN 765 Fixed Income Derivatives

BUFN 766 Financial Engineering

Gurdip Bakshi, PhD, Dean's Professor of Finance

Teaching / research focus: asset pricing, international finance, fixed income, derivatives

Course: BUFN 741 Advanced Capital Markets

BUFN 770 International Investment

Steve Heston, PhD, Professor of Finance

Teaching / research focus: asset pricing, derivatives, volatility, international finance

Courses: BUFN 650 Financial Mathematics

BUFN 770 International Investment

BUFN 771 International Corporate and Project Finance

Albert "Pete" Kyle, PhD, Charles E. Smith Chair Professor of Finance

Teaching / research focus: asset pricing, market microstructure

Course: BUFN 773 Institutional Asset Management

BUFN 774 Market Microstructure

Dilip Madan, PhD, Professor of Finance, former Managing Editor of *Financial Mathematics*

Teaching / research focus: asset pricing, mathematical finance, derivatives

Course: BUFN 767 Applied Conic Finance

Lemma Senbet, PhD, William E. Mayer Chair Professor of Finance

Teaching / research focus: corporate governance, financial institutions, international finance  
Course: BUFN 753 Corporate Governance

N.R. Prabhala, PhD, Professor of Finance

Teaching / research focus: empirical corporate finance, executive compensation  
Course: BUFN 751 Financial Strategy For Corporations

Haluk Unal, PhD, Professor of Finance

Teaching / research focus: financial institutions and banking, executive compensation  
Course: BUFN 762 Fixed Income Analysis  
BUFN 772 Bank Management

Russ Wermers, PhD, Professor of Finance, Director: Center for Financial Policy

Teaching / research focus: empirical asset pricing, institutional money management  
Courses: BUFN 764 Quantitative Investment Strategies

Mark Loewenstein, PhD, Associate Professor of Finance

Teaching / research focus: theoretical asset pricing, portfolio selection  
Course: BUFN 650 Financial Mathematics  
BUFN 763 Portfolio Management

Richmond Matthews, PhD, Associate Professor of Finance

Teaching / research focus: theoretical corporate finance, corporate governance  
Course: BUFN 752 Corporate Restructuring

Cecilia Bustamante, PhD, Assistant Professor of Finance

Teaching / research focus: theoretical corporate finance  
Course: BUFN 750 Valuation in Corporate Finance

Julien Cujean, PhD, Assistant Professor of Finance

Teaching / research focus: Asset Pricing, General Equilibrium, Information Economics, Liquidity  
Course: BUFN 761: Derivative Securities

Francesco D'Acunto, PhD, Assistant Professor of Finance

Teaching / research focus: empirical corporate finance  
Course: BUFN 755 Entrepreneurial Finance and Private Equity

Laurent Fresard, PhD, Assistant Professor of Finance

Teaching / research focus: empirical corporate finance, international corporate finance  
Course: BUFN 750 Valuation in Corporate Finance  
BUSI 640 Financial Management

William Mullins, PhD, Assistant Professor of Finance

Teaching / research focus: empirical corporate finance  
Course: BUFN 751 Financial Strategy For Corporations

Alberto Rossi, PhD, Assistant Professor of Finance

Teaching / research focus: empirical asset pricing, financial econometrics

Courses: BUFN 758N Financial Econometrics I

BUFN 758O Financial Econometrics II

Shrihari Santosh, PhD, Assistant Professor of Finance

Teaching / research focus: empirical asset pricing

Courses: BUFN 745 Financial Programming

Yajun Wang, PhD, Assistant Professor of Finance

Teaching / research focus: theoretical and empirical asset pricing, market microstructure

Course: BUFN 741 Advanced Capital Markets

Liu Yang, PhD, Assistant Professor of Finance

Teaching / research focus: empirical corporate finance

Course: BUSI 640 Financial Management

David Kass, PhD, Clinical Professor

Teaching / research focus: corporate finance, industrial organization

Course: BUFN 752 Financial Restructuring

Elinda Kiss, PhD, Associate Clinical Professor

Teaching / research focus: financial institutions, bank regulation

Course: BUFN 772 Bank Management

Sarah Kroncke, MBA, Senior Lecturer

Teaching / research focus: investment banking, equity analysis

Courses: BUFN 760 Applied Equity Analysis

Cliff Rossi, PhD, Professor of the Practice

Teaching / research focus: financial institutions, risk management

Courses: BUFN 754 Corporate Risk Management

BUFN 761 Derivative Securities

BUFN 772 Bank Management

Susan White, PhD, Clinical Professor

Teaching / research focus: corporate finance, taxes and payout policy

Courses: To be Determined