

Executive Summary

Columbia Business School proposes to initiate a new Master of Science in Financial Economics degree program. It is intended to fulfill a need for analytically-trained, industry focused financial economists with an in-depth understanding of the nature of dynamic asset pricing, portfolio allocation, optimal contracting and other topics in equilibrium financial economics. The School believes that persons so trained will be highly attractive hiring prospects for investment and commercial banks, investment managers (including hedge funds), consulting firms, and policy-oriented organizations.

This degree program will target, first and foremost, individuals who wish to switch careers and/or pursue a more narrowly focused course of study than is characterized by Columbia's and others' MBA programs. These individuals typically have career goals in financial research or consulting rather than general management. The proposed program may also attract candidates who are interested in a finance PhD but are not yet ready to commit to a longer course of study. We also anticipate that the program will be appealing to foreign nationals, who receive funding to study abroad, but who often spend an extended period in the U.S. taking classes without enrolling in a specific degree program.

The Master of Science Program in Financial Economics will require four semesters (20 months) of study at the Columbia Business School. As currently conceived, students must complete 48 credits (16 courses) for graduation. Of these courses, there are 10 mandatory ones of which a minimum of seven are at a PhD level, and three at the level of the MBA. A thesis will be required. This project could be academically oriented or have an industry focus.

In the highly competitive job market present in the U.S. today, the technical skills and statistical expertise gained in completing most of the course work offered by the PhD program will be highly valued in the employment market place. While the thesis project will be much less elaborate than a PhD thesis, it will nevertheless represent a significant body of work. The focus of the program will be to create practitioners who are experts at completing directed research projects, rather than individuals (PhD graduates) who are experts in selecting the problems to be solved.

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Master of Science in Financial Economics Degree Program Proposal

1. Purpose

Columbia Business School proposes a new Master of Science in Financial Economics degree program in order to fill the need for more analytically trained financial consultants and researchers. We believe recipients of this degree will be highly sought after by the commercial and investment banking industry, investment managers (including hedge funds), consulting firms, and policy-oriented organizations.

This new degree will also fill a gap in the Business School's current degree offerings by providing an opportunity for individuals to pursue a more intensive, in-depth course of study than provided by a finance concentration in the MBA program. The program will be distinct from the MBA because of its state-of-the-art analytical research focus rather than a broad based general management focus.

The program will also be distinguished from the PhD program by serving those students who, in most cases, plan to deploy their technical expertise toward careers in consulting or industry, rather than careers in university teaching.

In proposing this degree, the Division of Finance and Economics is confident that there are numerous potential candidates with academic preparation equivalent to that of students admitted to our PhD programs who wish to pursue a shorter course of applied, industry-focused study. We believe that these candidates will be fully prepared to participate in existing PhD classes and to complete a substantial research project. While qualified to study for the PhD, these candidates prefer to make a shorter time commitment without sacrificing an intellectually satisfying level of rigor. The Master of Science degree will offer them such an opportunity.

There are two other types of candidates, with slightly different profiles, who may also benefit from the same course of study.

The first category includes candidates interested in pursuing a finance PhD, who are analytically prepared, but do not yet have sufficient economics or finance background to be admitted into a top-notch program. Similar to "post-baccalaureate" programs for applicants to medical school, the MS program will serve these students by providing focused rigorous course training in conjunction with a substantial research component. Graduates of our program will be attractively positioned to apply successfully to full PhD programs, including the program at Columbia Business School.

The second category is made up of foreign nationals who typically spend a year in the United States taking classes without enrolling in a terminal degree program. Often these students are well educated, and have personal or national funding to support their time in the United States. The MS program aims to attract these students by providing them with a more structured education rather than, e.g., the nominal affiliation a visiting scholar would have.

The position of this program in the intellectual life of the school may be explained as follows: Doctoral study trains students not only to solve sophisticated problems but also to select the important problems to be solved. The MBA program trains students to create organizations and to manage them. Our MS program is designed for students who are attracted to the art and challenge of problem solving without wishing to be put in a position of having to define what is "interesting" original research. It will be mandatory for the MS students to complete PhD courses because, in doing so, they will be exposed to the level of thoroughness, technique, and sophistication expected of them in a formal research capacity.

The Finance and Economics Division at Columbia Business School is fully committed to making the Master of Science in Financial Economics the pre-eminent degree program of its type in the U.S.

2. Need

Why is the Proposed Program Needed?

In the present job market landscape, we anticipate that the technical skills, statistical expertise and in-depth intuition gained through the coursework component of a PhD program will be highly valued. For academically distinguished students who wish to emphasize these skill sets, the attainment of a Master of Science Degree in Financial Economics will position them well for careers in a wide range of financial service, consulting and investment management industries. While the MBA degree trains students broadly, the MS degree will provide students with a more specialized focus, which will allow them to suggest more sophisticated solutions to business and societal financial-related management problems.

Interest in the Program

Within Columbia College as well as in other Ivy League colleges, junior financial analyst positions at investment banks are the most highly prized and sought after entry level positions. We anticipate that some of these students will find the MS in Financial Economics an appealing alternative. These students will represent a targeted group for applications. Any foreign students seeking a significant credential for entry into the finance or consulting industries should find the program appealing as well.

Contrast with the Financial Engineering MS Program offered in SEAS and the Math of Finance Program offered by the Department of Statistics

The principal focus of these programs is derivatives pricing, and the computational tools available for undertaking such calculations. While students in the MS programs may take related courses as electives, financial engineering, per se, is not an emphasis of the proposed program.

Our goal is rather to give the students a depth of broad financial intuition, hence the prominent place that Microeconomic theory, General Equilibrium theory, Macroeconomic theory, and Finance theory occupy in our program. Recognizing that our students are most likely to be involved in empirical asset pricing exercises during their period of initial employment, required statistics and econometrics courses with this emphasis, figure prominently as well.

Competitive Landscape

Master of Science degrees in business disciplines are offered by a number of other Business Schools, and offerings in the field are expanding. At present, Columbia is well positioned to add an MS in Financial Economics degree to our current offerings because the Business School already has the expertise and reputation to attract and train a strong group of applicants. Our strongest competitor schools (Wharton, Harvard, Stanford, Kellogg, and University of Chicago-Booth) do not currently offer competing programs.¹ MIT (the other school in the Seven Deans' Cohort) has, however, recently launched a Master of Science Degree in Finance.

¹ Stanford offers a MS program for Executives and Wharton offers a joint MBA/MSE with its School of Engineering, but neither of these programs would compete directly with the proposed program at Columbia.

We believe that with Columbia's reputation and its New York City location, we will expand the pool of interested MS students rather than cannibalize on the applicant pool of these other schools.

While we have not consulted extensively with our competitor schools or industry contacts about the need for this program, our intention is to begin the program with a very small number of students in order to gauge demand and build the program slowly over time. Doing so will allow us to assess the effectiveness of the program and precisely gauge the market demand.

3. Student Body to be Served

Admissions Standards

It is our intention that the student body of the MS program will be virtually indistinguishable from the PhD candidate pool in their intellectual and academic qualifications. This is necessary in order that they be able to participate fully in PhD classes and not dilute the quality of those classes. Nevertheless, these students would differ from the PhD students on several other key dimensions:

- 1) They would not necessarily aspire to an academic career
- 2) They would not be ready to commit to a 4-5 year course of study
- 3) They would be prepared to pay for their degree

As with other proposed MS programs, the admissions process for the MS Degree in Financial Economics would be administered by the PhD office, which currently manages applications for the PhD program. Applicants will be required to take the GRE and/or GMAT, complete an application including an essay on their career goals, provide transcripts from all post-secondary courses of study, and submit letters of recommendation. As such it is identical to the Ph.D. admissions process. Non-native English speakers will be required to take the TOEFL exam and participate in a telephone conversation with a representative of the PhD office before admission. Admitted students must have academic records similar to admitted PhD Students.

As with PhD applicants, initial screening and preparation would be provided by the PhD office. Within the Finance and Economics Division, the final review of applications would be completed by a Masters Degree committee of 2-3 faculty members, with other members of the department each reviewing a small number of applications annually.

Strategies to Increase Student Diversity

There is likely to be a fairly small self-selecting applicant pool for this specialized MS program. Nevertheless, the MS program admissions and recruitment process will take several steps to make sure that qualified applicants from under-represented groups are carefully and thoroughly considered.

- The MS Degree program director will identify promising candidates and encourage them to apply to the program. This could take place by contacting Columbia College faculty & administrators for targeted recommendations, and by attending various minority recruitment forums (as already undertaken by the PhD office).
- The MS Degree Admissions administrator will flag all applicants that fall into under-represented groups and guarantee that applicants who do not make the initial cuts receive an additional review to confirm that the right admissions decision had been made.
- If targeted electronic marketing to potential applicants takes place through degree discipline mailing lists, marketing to under-represented target groups will take priority if appropriate lists are available.

Program Size

The planned strategy for the MS Degree is to launch the program at a small size and build the program slowly.

In year one, we expect to matriculate 5 students. In year two, we expect to add 8, expanding to at most 10 students per class by year three. With the program structured essentially as a 2-year course of study, a maximum of 20 enrolled students will be present when the program is at steady state.

Supervision and Advising

MS Students will be initially advised by an administrator in the PhD office designated as the MS Advisor. All students would take the same required classes for the MS Degree, without exception. In the third semester, students would enroll in a thesis seminar, led by a faculty member, who would receive course credit for teaching this class. During this semester students would be expected to present their work for encouragement and criticism on a regular basis.

Career Management

The Business School's Career Management Center (CMC) has agreed to develop resources for MS students specifically tailored to their needs, and prior experience. These resources will not overlap with the resources for the MBA program. In any event, we do not see MS and MBA graduates competing for the same entry level jobs, although their career paths may subsequently converge. As the MS program develops over time, the CMC resources will be evaluated and revised to best serve these students.

- The CMC will provide coaching and other resources and will enter into partnerships with MS students to help them learn the building blocks of career management.
- The CMC will provide access to job listing resources relevant to this constituency, and will work with the University's central career services to coordinate analyst level recruiting.
- We anticipate that MS students will, on average, have less work experience than MBA students, so the resources, including resume review, one-on-one meetings and interview coaching will be planned with this in mind.
- The MS program, while being also 2 years in duration, requires that the focus, timing and pace of the resource delivery be different from the MBA program. Therefore MS students will be discouraged from participating in the numerous MBA recruiting events, as they will be expected to study diligently.
- The University and the CMC cannot assist with job placements for foreign nationals with firms that are only able to hire US workers. Nonetheless, the CMC will provide the same coaching to these students for job searches in their home countries.
- MS students will receive access to the Columbia Business School Alumni Network in a fashion identical to other Business School degree recipients.

4. The Proposed Curriculum

The MS program will consist of a 4-semester course of study at Columbia Business School. Students will enroll in the program in the fall (September) and graduate in May or October of the following academic year, dependent on the completion date of the thesis project. Students must complete a minimum of 16 full length graduate courses (48 credits). Of these 16 courses, ten are mandatory. Of these ten courses, seven must be at a PhD level. A guided research seminar in which they will undertake an

original research project is also required. In most cases the project will be tied to an industry focused research question.

Requirements:

Prerequisites: Prior to commencing the program, all admitted students would be required to complete the following courses at an advanced undergraduate level:

- Probability
- Statistics
- Microeconomics
- Calculus 1, 2 and 3
- Linear Algebra

Given the Program’s mathematical intensity, all admitted MS students must successfully complete the “Math Camp” refresher course offered jointly by the Economics Department and the Business School PhD Program. This class begins in late summer prior to the first semester’s classes.

Courses for the planned MS in Financial Economics are presented below.

Semester	Core	Electives MBA	Electives PhD
Fall	B8207 Microeconomic Analysis I B9311-020 Introduction to Econometrics (PhD) B6302 Capital Markets & Investments (MBA) English Language Course	B8311 Options Markets (MBA).	
Spring	B8208 Microeconomic Analysis II B9302 Finance Theory I (PhD) B9311 Financial Econometrics II B9207 Aggregate Behavior and Asset Pricing (PhD)		
Fall	B9311 Empirical Asset Pricing I (PhD) B9311 Corporate Finance Theory (PhD) B9311 Thesis Seminar	B9377 Quantitative Investments B8399 Behavioral Finance	B9311 Empirical Corporate Finance
Spring	MS Thesis B9312: Thesis Seminar	B8312 Advanced Derivatives B8399 International Financial Management B8399-017 Fixed Income Derivatives B8835 Security pricing: Models and Computation	B9311 Empirical Asset Pricing II B9311 Models & Methods of Continuous Time Finance

Note that in their first semester, students who do not demonstrate fluency in English will be required to enroll in the English Language course. Students who are exempted from the course will enroll in Options Markets.

Course availability for the program will be managed by the Deans' Office to ensure that the MS program does not reduce the space available in popular courses for our MBA and EMBA students.

To this end, funds from the MS program could be used as additional compensation to add sections of popular courses and increase the course availability for MBA and EMBA students. In essence, this would allow the MS in Financial Economics program to "buy capacity" in popular courses, at a rate that is favorable to the EMBA and MBA students, such as one seat in a popular course for an MS student for every two seats the program creates for MBA/EMBA students. For example, if the MS program funded an additional offering of a 60-student session of a capacity-constrained course, then MS students would earn the right to 30 spaces in capacity-constrained courses. In this way, MS students can get access to courses and course availability to MBA and EMBA students will actually increase. Our initial budget allows for one capacity-expanding course addition.

All of the courses listed above are currently authorized and offered in regular sequence. Thus no resources need be expended in new course creation or in the expansion of sections of an existing course (at most 10 MS students are likely to enroll). The program is highly structured to ensure that all graduates of the program have been exposed to all the major research areas in financial economics. A highly structured program also helps to build class cohesion and encourages collaborative projects.

Descriptions of all required courses are at the end of this document.

Graduate level classes offered across the School and University may also supplement the degree's course requirements, if space is available. Relevant departments include Statistics, Computer Science, Psychology, Economics, and Industrial Engineering and Applied Sciences. Permission must be obtained from the MS Coordinator, or the student's faculty advisor, plus the School at the University that is offering the courses in question.

Thesis:

All MS degree students will be required to complete a capstone research project under the supervision of a participating faculty member.

5. Resource Utilization

I. Faculty and Staff

The MS Degree in Financial Economics will be led by an MS Degree Committee of two or three faculty members. All tenure-track members of the Finance and Economics Division Faculty will participate in the program through application review and teaching. A list of these faculty members with their degrees is below.

Andrew Ang (Ph.D., Stanford)
Geert Bekaert (Ph.D., Northwestern)

Patrick Bolton (Ph.D., London School of Economics)
Charles Calomiris (Ph.D., Stanford)
Bogachan Celen (Ph.D., New York University)
Pierre Collin-Dufresne (Ph.D., HEC School of Management)
John Donaldson (Ph.D., Carnegie-Mellon)
Marc Giannoni (Ph.D., Princeton)
Lawrence Glosten (Ph.D., Northwestern)
Bruce Greenwald (Ph.D., MIT)
Andrew Hertzberg (Ph.D., MIT)
Laurie Simon Hodrick (Ph.D., Stanford)
Robert Hodrick (Ph.D., University of Chicago)
Gur Huberman (Ph.D., Yale)
Wei Jiang (Ph.D., University of Chicago)
Michael Johannes (Ph.D., University of Chicago)
Charles Jones (Ph.D., University of Michigan)
Lars Lochstoer (Ph.D., University of California, Berkeley)
Christopher Mayer (Ph.D., MIT)
Martin Oehmke (Ph.D., Princeton)
Daniel Paravisini (Ph.D., MIT)
Tomasz Piskorski (Ph.D., New York University)
Tano Santos (Ph.D., University of Chicago)
Paolo Siconolfi (Ph.D., University of Pennsylvania)
Morten Sorensen (Ph.D., Stanford)
M. Suresh Sundaresan (Ph.D., Carnegie-Mellon)
Paul Tetlock (Ph.D., Harvard)
Maxim Ulrich (Ph.D., Goethe University Frankfurt)
Neng Wang (Ph.D., Stanford)
Shang-Jin Wei (Ph.D., University of California, Berkeley)
Daniel Wolfenzon (Ph.D., Harvard)
Jialin Yu (Ph.D., Princeton)

In its first years, the program will not require any additional faculty or staff. It is intended to take advantage exclusively of existing capacity in current Columbia Business School PhD and MBA courses.

Given that the Business School hopes to launch 2-3 programs of up to 10 students in Fall 2010, and the entire MBA school enrollment is approximately 1400, the increase in administrative workload will be minimal and, in any event, assumed by the PhD Office. As the programs grow, however, we will evaluate the need for additional staff and fund these incremental positions out of MS tuition.

II. Costs and Benefits of the Proposed Program

Given our plans to launch the program at a modest scale, we do not anticipate hiring additional faculty. The attached budget estimates assume a program of 8 students per year (16 total students at any one time) and allow for costs associated with running the program.

Tuition at Columbia Business School is currently roughly \$50,000. The Office of the Dean has proposed a net income sharing rule with the following parameters:

- 45% to General School Revenues
- 45% to the Finance and Economics Division

- 10% to the Doctoral Program.

Net income for this purpose is defined as total income minus all incremental costs of the program, such as faculty buyouts for additional teaching, new hires required by program, web and marketing costs, and materials as specified in the budget below. Costs will only be allocated if expenses are incurred specifically for the MS program.

This budget was developed in conjunction with budgets for all proposed MS programs, in order to ensure consistent planning across all divisions. All personnel, advertising, and material estimates were made based on conversations with faculty and staff at Columbia Business School. These costs will be allocated to divisional programs on a per-student basis.

In constant dollar terms,

MS in FINANCIAL ECONOMICS	
Category	Amount
INCOME	
CBS Tuition	800,000
Total Income	800,000
EXPENSES	
MS Degree Teaching (Classes offered because of new programs)	67,200
Contingency Adjunct Cost for extra teaching needs	51,200
Additional English Language Course (adjunct taught)	16,000
Additional Seminar Course in Financial Economics	35,000
Course materials distributed to students	30,400
Incremental Increase in PhD Program Budget	13,624
Incremental Increase in Student Affairs Budget	13,624
Incremental Increase in ITG Budget	13,624
Incremental Increase in Career Management Center Budget	27,248
Student events and orientation	8,000
Website and application design and maintenance	6,000
Marketing of the Programs (e-mail lists/ google ads)	19,200
Total Expenses	301,120
Net Revenue	498,880

SUMMARY of Revenue Sharing

	# of Students	16
	Total Net Revenue	498,880
	To Division	251,996
	To School	201,996
	To PhD Program	44,888

III. Indirect Costs: Space, Library support, Computer center, and other facilities

Given our plans to launch the program at a modest scale, we do not anticipate significant additional incremental indirect costs in the first year. Master of Science students would not receive dedicated work spaces. Students will not be promised access to Columbia Housing, but may be deemed eligible pending availability.

6. Quality Control: Internal Evaluation

In order to assess the academic quality and effectiveness of the Master of Science in Financial Economics Program, the Division, with the help of the doctoral program office, will survey program students by e-mail at the end of their second semester, 12 months after graduation, and five years after graduation. Survey data will be archived over time, and analyzed and summarized each year to allow for program improvements and to provide feedback to program directors and faculty.

The data to be collected and analyzed will include:

- Teaching evaluations by MS in Financial Economics students.
- Overall program evaluations by MS in Financial Economics students addressing: advising, curriculum, research seminar experience, and Career Management Resources.
- Job placement dates, positions, and firms for MS in Financial Economics students.
- Time to placement following graduation. This statistic will be collected by the Doctoral Office or the Career Management Center.
- Information regarding a graduate's future career will be maintained to the extent possible by the Doctoral Office or the Financial and Economics Division. Prior to a regular evaluation cycle, those students who have graduated since the prior evaluation will be contacted and asked their opinions as to the quality of the program and the extent to which it prepared them for their current job.

7. Quality Control: External Evaluation

The following authorities are recommended to the NYS Education Department as possible external reviews:

NAMES TO BE RECOMMENDED

COURSE DESCRIPTIONS:

B6302-001: Capital Markets & Investments

This course complements B6301 (a core course) by introducing market and portfolio perspectives. The course starts with the discounted cash flow methodology, which ends B6301, and continues to the concept of term structure in the valuation of risk-free cash flows, including forward rates. Next, the general problem of valuing risky or uncertain cash flows is considered. This leads to the classical theoretical problems of portfolio diversification, the efficient frontier and two-fund separation. The capital asset pricing model (CAPM), arbitrage pricing theory (APT) and efficient market theory are explained. The Modigliani-Miller theory is presented as a corporate-perspective.

B8311-001: Options Markets

The course provides a broad overview of the field of derivatives. It is divided in three parts. Part I is devoted to the valuation of forwards and futures. After that, in Part II, we turn to the problem of option valuation, which is the heart of the course. We first deal with simple no arbitrage restrictions that can be imposed on the price of European and American call and put options. These are the slope and convexity restrictions, useful bounds that are model-free.

We then cover in detail the Binomial Option pricing Model. This part of the course is fundamental in everything that follows. It contains the two main concepts in what concerns derivatives valuation: the concept of dynamic replication and the principle of risk neutral valuation. Once the Binomial Option Pricing Model is well understood the transition to the Black-Scholes Model is rather straightforward. We sketch three different ways of deriving the Black-Scholes formula, each providing a different insight into the mechanics of derivative pricing. Finally, we dwell in an important empirical flaw of the Black-Scholes Model, the volatility smile. We study the consequences of this important empirical regularity for option valuation and address it in the context of Stochastic Volatility models and the implied binomial tree of Derman and Kani.

We then turn to two important applications of option valuation: Risk management and the valuation of corporate securities. We introduce the concept of the Greeks and apply it to the hedging of option-like payoffs. We discuss here some of the recent developments in markets for hedging volatility risk. The valuation of corporate securities such as warrants, defaultable debt, convertible securities, and callable convertible bonds is also covered.

Part III, the last part of the course, is devoted to fixed income derivatives valuation. We start with some very important instruments like Treasury Notes futures, eurodollar futures, and fed funds futures. Next we study the valuation of swap contracts: plain vanilla interest rate swaps, foreign currency swaps, and, finally, commodity and equity swaps. We then introduce the concept of swaption, or the option on the swap. In order to value options on interest rates, like caps and floors we need models that are slightly different than the ones covered in Part II. We first cover Black's Model, which is the market standard for the valuation of interest rate caps, floors, collars, and swaptions. If time permits, we then study the Black-Derman-Toy Model. Black-Derman-Toy belongs to a class of models called no arbitrage models, which are those that are designed to be perfectly consistent with the current term structure of interest rates. We cover the uses of this model for option valuation through an example of the pricing of a swaption. Finally the last lecture is devoted to a fascinating new field, credit derivatives. Here we introduce the basic instruments, such as Credit Default Swaps, TRORS, and Collateralized Debt Obligations and discuss some of the issues related to their hedging and valuation.

B8399-017: Fixed-Income Derivatives

The fixed income derivative markets have experienced tremendous growth over the past several years. Much of this growth has occurred in the over-the-counter (OTC) markets. The purpose of this class is to provide an overview of these markets, with particular emphasis on the fixed income OTC markets (perhaps better known as the swaps market). The course will examine a variety of the derivative products

which are actively traded. Emphasis will be placed on understanding how the products are structured, how they are priced and how they are used as either risk management tools or yield enhancement trades.

B8835-001: Security Pricing: Models & Computation

Modern financial markets are marked by the widespread prevalence of new financial products, the importance of risk management, and the availability of powerful computational technology. In this class, we develop financial models and computational methods to solve pricing, hedging, and portfolio optimization problems that appear every day in financial markets. The emphasis is on a practical approach: we apply models and methods in a hands-on fashion to real problems, and simultaneously highlight their limitations in real situations. We develop techniques to price a wide array of equity derivatives, including path-dependent options and multi-asset options. We explore the related problems of hedging and risk management, and we address issues that arise in short and long term portfolio optimization. We construct models for the evolution of interest rates, to allow for the pricing and hedging of interest rate derivatives. Finally, we discuss models for credit sensitive securities.

B8399-014: Behavioral Finance

Finance - corporate and capital markets - is based on the premise of optimal, rational behavior on part of market participants. Research on decision making has documented systematic deviations from optimality, even when strong incentives to optimize are present. The course will cover both the psychological insights and their applications to finance. Students who will take it will 1) improve their understanding of financial markets and the relation between human behavior and asset prices, 2) understand and improve their own decision making processes, 3) gain insights into the motives and modes of behavior of colleagues and employees, and 4) acquire marketing skills especially in the financial services domain.

B8312-001: Advanced Derivatives

This course is designed to explore topics for which the basic options markets course has already laid the foundations. Students who have not taken B8311 are strongly advised to take that course first.

In this course we will explore various derivatives markets and strategies that are used in the economy by a) Governments, b) Corporations, c) Money managers, and d) Investment banks.

The course will cover three main areas: a) equity derivatives, b) credit derivatives, and c) fixed-income. Each session will be organized around one or two key papers. In addition, class notes will be used to supplement and clarify issues. Papers that are highlighted are required reading assignments.

B8399-019: International Financial Management

The course examines several important issues in international corporate finance using a mixture of classes involving lecture/discussion and the analysis of cases. After a review of international finance fundamentals, considerable time is devoted to international capital budgeting decisions, which require an understanding of exchange rates and the determination of an appropriate cost of capital. We examine these issues as they arise in the valuation of direct foreign investments, in international joint ventures and in international mergers and acquisitions. A second issue is the determination and management of foreign exchange risks of various types. The cases include discussions of the use of foreign currency forwards, options, and swaps. A third issue involves the use of innovative, international financing vehicles for the multinational corporation. A fourth issue is valuation of corporations in emerging markets, and a fifth issue is the use of project finance.

B8207 Microeconomic Analysis

First course in microeconomic theory in the doctoral sequence. Consumer and producer choice, intertemporal optimization, general equilibrium and welfare

B9311-020 Introduction to Econometrics

As the course title implies, this is a first course in econometrics for Ph.D. students in finance. We will start by reviewing some key ideas in probability, estimation, and statistical inference. Then we move on to linear regression and its discontents, all of which is treated as a special case of the generalized method of moments (GMM). We also do a little bit of time series along the way. You will also get your hands a bit dirty working with data and statistical packages.

Previous exposure to (and recall of!) probability, simple statistics, and linear algebra is assumed.

B9311-021: (PhD) Financial Econometrics

In this course we study econometric methods relevant for empirical finance. Financial applications will be discussed along the way to appreciate the econometric techniques and to hopefully stimulate your research interest in some of the practical issues.

Prerequisite: The equivalent of Intro to Econometrics taught by Professor Charles Jones in Fall 2004. Knowledge of finance theory at the level of MBA Capital Markets course is assumed. Working knowledge of a statistical package (STATA and Matlab are recommended).

B9311-011: (PhD) Corporate Finance

This course has the objective of introducing doctoral students to academic research in corporate finance. The emphasis is on theoretical research, with special emphasis on models using the tools and techniques in the economics

B9311-008: (PhD) Models & Methods of Continuous Time Finance

This course is an introduction to continuous-time finance. The first part of the course provides the foundations of continuous-time modeling. Students learn about continuous-time stochastic processes, Markov processes, martingales

B9311-023: (PhD) Empirical Methods in Corporate Finance

The course is for PhD candidates (in finance, economics, and accounting) exclusively, and is not open to MBA candidates unless with the instructor's permission. Auditing

B9311-015: (PhD) Asset Pricing I

This is a first course in empirical work on the asset pricing side of financial economics. This involves a combination of financial and econometric theory, and getting dirty working with data. The field itself is vast, but we will focus on two core ideas: 1) time series properties of asset returns (predictability, volatility, correlations with other variables etc) and 2) cross-sectional properties of asset returns implied by equilibrium asset pricing models (including CAPM, consumption-based asset pricing, factor models etc).

We'll also briefly look at some simple term structure models. The course does not do any empirical tests of derivative pricing models, and concentrates on discrete-time methods. We leave derivatives and continuous-time methods to other courses. To examine these ideas, we will use a variety of econometric techniques, including maximum likelihood, GMM, Bayesian methods, and various time-series models, including ARMA, GARCH, and regime-switching. The course is designed for first year doctoral students in finance. Economics doctoral students and other finance doctoral students are also welcome. Other students may take this course if they have previously taken at least one PhD-level finance course on asset pricing and one PhD-level course on statistics or econometrics

B9311-016: (PhD) Empirical Asset Pricing II

Primarily for PhD candidates; open to outstanding MBA candidates with the instructor's permission. Topics regularly include continuous-time financial models, empirical finance, market microstructure and information economics.

B9302-001: (PhD) Finance Theory I

First course in the theory of finance in the doctoral sequence. Individual and aggregate decisions under uncertainty, portfolio theory, general equilibrium under uncertainty, the capital asset pricing model, introduction to option pricing and introduction to dynamic asset pricing models.

B9377-006: Quantitative Investments (Master Class)

The course will deliver the theory and quantitative tools necessary for active quantitative portfolio management, concentrating on quantitative stock selection models. The course will cover the fundamental concepts of asset valuation using quantitative models incorporating time-varying risk and risk premiums, implementing forecasts from those models, controlling for risk, and benchmarking portfolio performance. The class will explain the economics behind different strategies and how these theories can, or in some cases cannot, explain the returns and risk associated with these strategies.

Teams will propose and implement their own quantitative investment strategy using Factset software, which is the tool used by many investment banks and buy-side firms. Alphatester, within Factset, will be used to backtest quantitative strategies and Northfield/BARRA/Axioma will be used to optimize the strategies. Team work will be intensive and teams will receive feedback from industry quant experts.

B9207: Aggregate Behavior and Asset Pricing

This class introduces the students to dynamic macroeconomics within the context of the question: can we devise models which simultaneously explain the basic stylized facts of growth, the business cycle and the financial markets?