

1. Economics (G09-36)

**QUEENS COLLEGE
OF
THE CITY UNIVERSITY OF NEW YORK
PROPOSAL TO ESTABLISH A PROGRAM
IN
RISK MANAGEMENT
LEADING TO THE
MASTER OF SCIENCE DEGREE**

EFFECTIVE FALL 2010

**SPONSORED BY THE DEPARTMENTS OF ECONOMICS, ACCOUNTING AND INFORMATION
SYSTEMS,
AND COMPUTER SCIENCE**

Queens College of the City University of New York

Department of Economics

**New Program Proposal
For A
Masters Program in Risk Management**

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ABSTRACT

This is a proposal for a new Master of Science in Risk Management designed to provide advanced education for students who wish to prepare for careers involving risk management. Recent high profile failures of banks, insurance companies and other financial institutions have exposed a variety of weaknesses in the way risk was managed by these companies, as well as failures in regulation which have contributed to our current economic crisis. Most importantly, the crisis has emphasized the need for an integrated approach to risk management, which considers how all elements of a business contribute to its risk profile, and recognizes that effective management begins with good governance. Well-trained professionals with a clear understanding of how risks taken in all parts of a company interact with one another, will be critical to the future of business and financial markets. At the same time, risk management professionals need not only a comprehensive overview of all the dimensions of risk that face businesses today, but thorough training in one or more particular applications of risk management. We therefore require students to choose among three areas of concentration: Accounting, Finance, and Dynamic Financial Analysis Modeling.

Queens College is well positioned to offer strong training in risk management. The new program draws on existing strengths in the Departments of Economics, Accounting and Information Systems, Mathematics and Computer Science. The program aims to prepare our students for real world problems and opportunities so they can be effective either as dedicated risk management professionals or in areas where risk management plays vital roles, such as in accounting and information technology, as well in governmental agencies where being able to estimate or assess risk models in order to regulate risk is critical. The program requires between 30 and 71 credits, depending on undergraduate preparation. Students with the appropriate undergraduate background can complete any of the concentrations in 30 credits (3 semesters full time). All students must complete a capstone course in applied dynamic financial analysis which will bring together all of the skills that they have acquired in the program. The class will involve team projects that will allow students to take on a role appropriate to their choice of specialization, and will expose them to real-world risk management challenges. All classes will be taught by either full-time faculty or by

senior-level industry practitioners.

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INTRODUCTION

The recent financial crisis has put a spotlight on the critical role of risk management in modern business enterprises. High profile failures of banks, insurance companies and other financial institutions have exposed a variety of weaknesses in the way risk was managed by these companies. Most importantly, the crisis has emphasized the need for an integrated approach to risk management, which considers how all elements of a business contribute to its risk profile, and recognizes that effective management begins with good governance. Well-trained professionals with a clear understanding of how risks taken in all parts of a company interact with one another, will be critical to the future of business and financial markets. Managers will need broader based, more comprehensive risk models. Stronger controls will be needed to prevent any management overrides, and boards of directors will need a better understanding of what the risk model is -- then impose a discipline preventing management from overriding the very controls that are there to protect the enterprise. Risk management professionals and business leaders must be educated about management of risk in both capital and insurance markets, and their relationship. This need for a high quality, interdisciplinary approach to risk management education leads us to propose this program.

This interdisciplinary program, which will be housed in the Economics Department, and represents a collaboration between the Departments of Economics, Accounting and Information Systems, and Computer Science, drawing as well on the Department of Mathematics, emphasizes an integrated approach to understanding and managing risk. We believe strongly that an integrated, interdisciplinary approach to risk management is the right way to teach our students and to prepare them for real world problems and opportunities. They may choose to work as dedicated risk management professionals, or in fields such as accounting, where a thorough knowledge of risk management would be a great asset.

Risk management professionals need not only a comprehensive overview of all the dimensions of risk that face businesses today, but thorough training in one or more particular applications of risk management. We therefore require students to choose one of three areas of concentration: Accounting/CPA, which will prepare students to become Certified Public Accountants (CPA), Finance/CFA, which will prepare students for the series of exams required to be designated as a Chartered Financial Analyst (CFA) and Dynamic Financial Analysis (DFA) Modeling, which will give computer science students training in designing models applicable to a variety of risk management applications, e.g. economic and econometric models, actuarial models, hedging models, and asset/liability management models.

All students in the program will take a common set of required courses, which will expose students to a comprehensive view of risk management, and training in each of the core areas of risk management: enterprise risk management, accounting for risk, risk transfer to financial markets through options and futures, risk transfer to insurance markets, and pricing and capitalizing retained risk. Students in the accounting concentration will also receive more intensive training in accounting to prepare them for the CPA exams and to ensure that they are well prepared for the increasing demands of the accounting profession. Students in the finance concentration will be given training in portfolio management, financial econometrics, and accounting for risk and financial statement analysis. This training will not only prepare them for the CFA exams but will give them tangible, marketable, skills that are in demand in financial functions and capital markets. Students in this concentration may also wish to pursue an actuarial certification. Finally, students in the DFA Modeling concentration will receive intensive training in finance as well as hands-on exposure to economic, econometric and asset liability management modeling. This experience should make them excellent job prospects.

A key component of the program is the capstone course, which will bring together students from all three concentrations to work on real-world asset-liability management projects. The projects are interdisciplinary and will make use of proprietary software provided by Barrie & Hibbert, a financial modeling software firm that has donated use of its software and is a strategic partner for the program. The opportunity to perform real-world modeling, gaining experience using the kinds of tools that are employed by leading firms in industry, will allow students to coalesce all the skills learned in the various courses in the curriculum and provide students with a competitive edge in their careers. Students will participate in the course on a directed basis depending on their area of concentration and will work in interdisciplinary teams on a particular project. A team will be comprised of approximately four students--two from finance, one from accounting and one from the DFA modeling track and each student will focus on a work module that corresponds to his or her area of expertise. As an example, one finance student will focus on modeling the economic variables underlying the variability in assets and liabilities; one finance student might focus on constructing hedges to mitigate liquidity and other cash flow risk; the accounting student may focus on the projecting the GAAP financial statement impact from the asset and liability allocation decisions, and the DFA modeling student will write and modify source code within the software to accurately model the variables and their hedges.

Appropriate choice of electives in the program will help prepare students to obtain a variety of professional certifications, including Certified Public Accountant (CPA) and Chartered Financial Analyst (CFA), as well as a variety of risk management certifications awarded by such organizations as the Risk and Insurance Management Society (RIMS), the Society of Actuaries (SOA), the Casualty Actuary Society (CAS), the Professional Risk Managers' International Association (PRIMIA), and the Global Association of Risk Professionals (GARP). Appendix A explains in more detail what students need to prepare for these examinations, and what other preparation may be required.

Students successfully completing the program will be trained for careers in professional risk management functions within industry, in financial services firms, in risk management consulting firms, and for the big four accounting firms' auditing and business advisory practices. In addition to the foundation courses on risk management, students will specialize in one or more facets of risk management, which will prepare them to apply for one of the certifications listed above. Regardless of specialization, all students will receive a comprehensive overview of risk management, the interrelationship between financial hedging techniques/quantitative risk management and insurance industry practices, and the critical place both play for enterprises in reducing risk.

PURPOSE AND GOALS

The M.S in Risk Management aims to meet industry needs for better-trained professionals who work in a risk management capacity, both as dedicated risk management professionals and in areas such as accounting and information technology that play vital roles in an organization's risk management processes. The program is intended to build on existing areas of expertise within Queens College to create a nationally recognized program that benefits a substantial population of Queens College graduates, graduates of other CUNY senior colleges, and working professionals from the local area, particularly those from the financial services sector. The interdisciplinary nature of the program, and the focus on all aspects of risk management will provide an important advantage to our graduates in seeking future employment.

The ultimate goal in building a risk management program is to make Queens College a recognized leader in risk management education in the U.S. Leadership would be achieved by combining academic rigor with partnerships with local firms actively engaged in risk markets, such as investment banks, insurers, and money managers, and with local firms actively engaged in risk consulting and auditing, such as major consulting and accounting firms. Outside local practitioners might be tapped to be guest lecturers in courses, to contribute towards risk management symposia hosted by Queens College, to contribute to building a database of business cases, to conduct joint research, and to provide

internships for Queens College students. For example, Deloitte and Touche, which has provided a letter of support, has already offered to co-sponsor a symposium in Fall 2009 on public pension risk, a critical issue in risk management today, and to provide experts in various areas of risk management to lecture to our students.

NEED AND JUSTIFICATION

Four factors justify offering an M.S. in Risk Management at Queens College: industry needs, the lack of comparable academic programs in our geographic area, student demand, and existing resources that will contribute to the program. Queens College has expertise in the foundation building blocks of a risk management program, such as actuarial studies, economics and finance, accounting, and computer sciences. The College has large accounting and computing sciences departments with students seeking formal graduate training in programs that can both satisfy professional educational requirements and enhance their career opportunities for advancement. Queens College economics and finance graduates will also benefit from the program. In addition, other CUNY graduates in these disciplines may be attracted to the new program. These four factors should allow Queens College to build a strong, interdisciplinary program that leverages existing faculty and curriculum, enrolling a significant number of students and enhancing their job placement prospects, and fulfilling a geographic need within the CUNY system.

A. Competitive Landscape

Existing risk management graduate programs focus either on quantitative risk measurement/financial hedging techniques, or alternatively, on insurance industry practices and certifications, both of which offer integral but incomplete approaches to risk management. While corporations now recognize the need for an integrated approach to risk management and are allocating company resources towards it, there are few academic programs in place that address the need for an integrated framework to teaching risk management to students who will take on key risk management responsibilities after graduation.

Our M.S. program in risk management will distinguish itself from a traditional financial or insurance risk management program by being multi-disciplinary, drawing not only upon finance, statistics, and math, but also risk transfer markets, actuarial sciences, accounting, computer sciences, and management/corporate governance. Traditional financial risk management programs are typically highly quantitative, measurement oriented, and focus on existing capital markets tools to manage known risks. Such programs in the local area include Columbia University, NYU, Hofstra, and Baruch. Traditional insurance risk management programs train students in the utilization of insurance products as the means to transfer risk and include local institutions such as St. Johns, the University of Hartford, and the University of Connecticut. NYU has recently introduced an executive masters' program in risk management, but it is aimed at a very different student population than is ours.

Institutions outside of Queens College's market that offer risk management programs are the University of Wisconsin, Temple, Georgia State, and the University of Pennsylvania, which has a program similar to that proposed herein, and Georgia State, which offers two distinct programs, one in financial risk and another in insurance risk management. Other programs have strengths in other facets of risk management, such as North Carolina State University's program that focuses on governance and targets the executive education market.

We expect this to be a growing area, and indeed, demand would probably exist for more than one program in the future within CUNY. We expect this program to draw primarily on the borough of Queens, as well as Long Island, and to a lesser extent Brooklyn, the Bronx and Westchester.

B. Industry Needs

Introduction of the M.S. Program in Risk Management is partly motivated by industry needs, which are currently strong and expected to grow in the future. There are three drivers behind the growing and changing industry needs:

- Risk management is becoming a prominent function within corporations and requires staffing with appropriately trained professionals. The staffing is both directly within the risk management division but also spills over into all functions with risk management responsibilities, such as accounting and informational technology.
- Financial and non-financial risks and their markets are losing their distinctions and this means that traditional academic backgrounds that focus on one kind of exposure, such as market risk, are inadequate to relate to newly emerging risks, changing risks types, and innovations in risk transfer markets.

- Pension risk is a blend of various risk exposures and is fast-growing; most corporations are inadequately staffed to manage this risk.

In the past several years, risk management has surfaced as a major focus area and as a distinct business function in corporations. More recently, the high profile risk management failures of financial institutions and corporate businesses have exposed material weaknesses in risk management functions. At this time, there is a recognized need in industry for professionals to be trained in a more comprehensive manner.

Effective risk management must be practiced enterprise-wide and, in addition to the management of traditional financial and casualty exposures, must embody such functions as operations, legal and regulatory compliance, corporate governance, information technology, and accounting and auditing. As an example of the new prominence of risk management, Standard and Poor's, as of July 2008, now evaluates all corporations—financial and non-financial alike—on their risk management practices before assigning a rating (Moody's evaluates financial institutions on this basis as well). This means that the quality of a corporation's risk management function will have a direct bearing on its ratings, and as a consequence, its cost of capital.

Industry's need for risk managers to have a broader-based skill set has recently become more acute with major headline-making debacles. The high profile losses experienced by banks, investment banks, hedge funds, insurers, and non-financial corporations have called attention to the limitations of risk management practices. Ironically, many of the companies experiencing the losses had reputations of having best-in-class risk management, such as Bear Stearns and AIG.

Importantly, while the quantitative measurement of risk has become increasingly sophisticated and widespread in use across most industries, the actual management of risk has not kept pace. In part, this is due to practitioners having narrow areas of expertise, such as credit risk or casualty risks, but lacking the capacity to size and mitigate exposures, which fall outside of their backgrounds. More importantly, risk management is usually not firmly embedded within the corporation's basic culture, with rewards systems, reporting relationships, earnings pressures, and accounting conventions each contributing to risk management shortfalls.

The evolution of the capital and insurance markets is another source of the industry need for risk management professionals who have been trained in an integrated program that recognizes the interrelationships among different dimensions of risk. Capital markets and insurance markets are losing their distinctions. The securitization markets are increasingly assuming traditional insurance risks such as mortality, property/casualty, and policy lapse risk. Insurance markets are increasingly assuming credit risk, which is traditionally a banker's risk, and market risk. The two markets also have adopted each other's technology to assume and intermediate risk—insurance holding companies have formed securities-licensed capital markets subsidiaries that sell financial derivatives; investment bank holding companies have formed offshore special purpose reinsurers that provide traditional reinsurance. Furthermore, new risks are beginning to be transferred in organized markets, and include biological, terrorist, chemical, longevity, extreme mortality, and residual asset values.

Finally, pension risk management is a growing field and is expected to continue as such in the foreseeable future given population aging and widespread underfunding. Pension exposures are a blend of longevity, insurance and investment risks, have specialized accounting issues, and substantial computational needs, requiring multi-faceted expertise to effectively manage them. To operate effectively in these risk markets, today's risk management professional must be versatile enough to understand the fundamentals behind the entity's myriad risk exposures, its risk appetite, and risk mitigation options.

C. Governmental Needs

In addition to responding to industry needs, the M.S. in Risk Management is responding to government needs for better-trained risk managers. In part, the recent financial crisis was due to a failure of regulation, and there are political pressures to address the failure and to correct the potential for other government risk management failures. Regulatory bodies, from state insurance commissions, to the Federal Reserve Board, the OCC, and the SEC are poised to allocate resources to their risk management practices in response to the current crisis. Federal and state governments and their agencies that assume risks for their constituents, such as the FDIC, the PBGC (Pension Benefit Guaranty Corp), state and local pension funds, the California Earthquake Authority, the Florida Hurricane Catastrophe Fund, TARP (Troubled Asset Relief Program), TALF (Term Asset Backed Security Loan Facility) and the PIPP (Public Private Investment Program) also are coming under increased scrutiny and are poised to allocate resources to prevent new crises from developing. These government programs and entities are in the business of taking risks, and the potential for their mismanagement with the consequence of a direct claim on taxpayers is headline news in the current fiscal environment. Unfunded liabilities are political issues; regulators and government agencies will need to size,

mitigate, price, transfer, and fund the liabilities and will need resources to undertake these activities. In addition, the GASB (Governmental Accounting Standards Board) is following the lead of FASB and the IASB and revisiting accounting rules as they relate to contingent liabilities, mark-to-market rules for financial assets and liabilities, pension accounting as it relates to funding adequacy and asset-liability management, and other issues that are directly relevant to risk management practices.

Appendix B contains examples of risk management job listings in industry and government.

STUDENTS

A. Interest/Demand

For the accounting, economics/finance and computing science disciplines, there are several distinct needs that will be satisfied by the program.

- For accounting students, the degree will (i) satisfy a new CPA educational requirement for 150 credits and (ii) train students in a relevant subject matter, since accounting practices are moving towards risk-based accounting and risk-based auditing and as the International Financial Reporting Standards system (IFRS) replaces Generally Accepted Accounting Principles (GAAP), the guidelines issued by the Financial Accounting Standards Board (FASB) and currently in use in the United States. As complexity grows in business transactions, accounting needs to keep pace, which necessitates accounting students to be well grounded in the fundamentals of recognizing, measuring, and mitigating risk. Formal risk management training would better prepare accountants for the changing accounting environment and make them sought-after job candidates. These students should choose the Accounting/CPA Concentration.

Approximately 375 students graduate from Queens College with a B.A. in accounting each year. We assume approximately 25 will be accepted to the new program.

- For finance/economics students, the degree will enhance their career opportunities by providing a relevant, tangible, and marketable application of their finance, quantitative methods and economics skill set. By appropriate choice of electives, students can prepare for the examinations to qualify for designation as a Chartered Financial Analyst (CFA). These students should choose the Finance/CFA concentration.

About 200 students graduate with a B.A. in economics each year at Queens College. We assume that 10 will choose the new program. Approximately 120 students receive a BB.A. each year. We assume that 10 of those will be chosen for the program.

- For computing sciences students, the degree will enhance their career opportunities by broadening their educational backgrounds and by providing a relevant and marketable application of their skill set, as information technology is playing an increasingly vital role in risk management. These students should choose the DFA Modeling concentration.

Between 80 and 100 students receive undergraduate degrees in computer science each year, and we assume that 5 will be accepted to the program.

- We also believe that the program will attract graduates from other CUNY colleges as well as other colleges and universities in Queens as well as Long Island, Brooklyn, the Bronx and Westchester. The program is unique in the local area in its interdisciplinary approach and broad focus on all aspects of risk management.

B. Enrollment Projections

Projected enrollments are below. These are conservative estimates based on the anticipated demand from the Queens College undergraduate population. If significant numbers of students apply from other institutions, demand may be higher than forecast, allowing us to increase the selectivity of the program, and to expand the program as resources permit. We provide two sets of projections: first, enrollments assuming that students attend the program full time, and second, assuming that 20% of students attend full time and 80% part-time (two courses per term)

Projected Enrollment (FTE students)

All Students Full-time

Year 1	Year 2	Year 3	Year 4	Year 5
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50	95	95	95	95
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**Projected Enrollment (FTE students)
Some Part-time Students**

Year 1	Year 2	Year 3	Year 4	Year 5
30	57	73	73	73

A 10% attrition rate is assumed. It is anticipated that most of the students who are admitted to the Masters' Program in Risk Management will graduate from the program successfully. Reasons that attrition could occur include: 1) the student fails to maintain a 3.0 GPA (see requirements below); or 2) the student changes academic or career goals. Although some attrition can be expected for each of the reasons listed above, we expect this attrition to be minimal once students complete the graduate foundation coursework because in order to complete the graduate foundation coursework or equivalent, students must have shown some success in the skills necessary to succeed in the program, particularly in quantitative skills and statistical training. Attrition will also be minimized having each student meet at least once each semester with an advisor in his or her area of concentration, to ensure that he or she is meeting his or her academic and professional goals.

C. Governance

The M.S. in Risk Management will be housed in the economics department, the director will be an economics faculty member, and the economics department curriculum committee will originate any changes in the program curriculum. Because of the interdisciplinary nature of the program, a faculty advisory committee composed of members of the economics, accounting and computer science departments will oversee the program and make recommendations about curriculum. The advisory committee will also serve as an admissions committee. Students will be admitted for matriculation in the fall semester only.

D. Admissions Requirements

The faculty advisory committee and the program director will make admission decisions. Admission will be for the fall semester only. Students must specify the area of concentration when applying to the program.

The following admissions requirements are relevant to all students applying to the program:

1. An undergraduate Bachelor's Degree from an accredited college or university.
2. All students should have earned a minimum GPA of at least 3.0 in their undergraduate program in order to apply. If more applications are received than can be accommodated in the program, the actual threshold for admission may be higher.
3. GMAT (may be waived by permission of the program director).
4. For international students, a minimum TOEFL score of 600 (paper-based) or 250 (computer-based) or 100 (internet-based). This may be waived for student holding a degree from a US college or university with permission of the director.
5. No more than 12 credits may be transferred. Evaluation of the transferred credits will be by the faculty advisory committee.

Although students with any undergraduate background may apply, students with a finance or accounting background (or computer science for the DFA Modeling concentration) will be able to complete the program more quickly. Accounting majors or students graduating in any of the majors leading to the Bachelors of Business Administration at Queens College with a GPA of 3.0 or above may apply for, and on acceptance, complete the Finance/CFA concentration in 30 credits. Students with other backgrounds such as Mathematics, Economics or Computer Science or other majors may need to complete additional graduate foundation courses for any of these concentrations, up to a total of 15 additional credits for the Finance/CFA and DFA concentrations. Students with a minimum 3.0 GPA in an undergraduate major in accounting or any of the B.B.A. majors at Queens College may apply for, and on acceptance, complete the Accounting/CPA concentration in 30 credits. Students without an accounting background wishing to enter the Accounting/CPA concentration will need to complete graduate foundation coursework in addition to the 15 credits described above, to a maximum of additional 26 credits.

Students who have taken the following undergraduate courses will not need to take the basic graduate foundation courses: introductory micro- and macro-economics (ECO 101 and 102 or equivalent), introductory corporate finance

(BUS 241 or equivalent), money and banking (ECO 215 or equivalent), statistics (ECO 249 or equivalent) and introductory accounting (ACC 101 and 102 or equivalent). Having taken the following courses will exempt students from the additional graduate foundation courses required for the Accounting/CPA concentration: intermediate accounting (ACC 201 and 202 or equivalent), cost accounting (ACC 305 or equivalent), quantitative techniques in planning and control (ACC 306 or equivalent), advanced accounting (ACC 311 or equivalent), auditing I and II (ACC 321 and 322 or equivalent), business law I and II (ACC 261 and 362 or equivalent), federal and NY state taxes on income (ACC 367 or equivalent), and computers for business (CSCI 012 or 018 or equivalent).

CURRICULUM

The M.S. in Risk Management takes between 30 and 71 credits to complete, depending on undergraduate background. As described above, students with appropriate prerequisites taken at the undergraduate level should be able to complete the program in 30 credits, or three to four semesters. Students must choose one of three concentrations: Accounting/CPA, Finance/CFA or DFA Modeling. All students must take an overview course which will give them a broad view of risk management, and must also take three additional courses, accounting for risk, risk transfer to financial markets and risk transfer to insurance markets (unless they have taken an equivalent course in their undergraduate program). In addition, all students must take a team-based, hands-on capstone course after all required courses are taken and 21 credits have been taken in the program. Students will have additional required courses specific to their chosen concentration. If equivalent courses have been taken as an undergraduate, a set of additional electives are recommended. Course descriptions for all required courses are found in Appendix C, while syllabi for new courses are in Appendix D. Program requirements are summarized in Appendix E.

Areas Of Concentration

Accounting/CPA Concentration

The concentration is designed to give students a solid risk management foundation, including basic risk management skills in finance, math, and modeling plus training in enterprise risk management. The four graduate level accounting electives will further enhance the student's accounting expertise as it relates to tax, audit, communications, or business law. The curriculum satisfies NY State's 150 hour education requirement for the CPA and provides students with a differentiated skill set to complement their core professional skills.

Finance/CFA Concentration

The concentration is designed to give students a solid risk management foundation, including basic risk management skills in finance, math, and modeling plus training in enterprise risk management. The four graduate level finance electives will further enhance the student's finance and financial modeling expertise in the areas of econometrics, asset liability management, and capital and insurance markets. The curriculum covers a vast majority of the CFA Institute's body of knowledge and should help students be well prepared to study for and pass the three exams required for the CFA Charterholder professional designation. The curriculum also covers a vast majority of the Society of Actuaries and Casualty Actuarial Society's body of knowledge and should help students be well prepared to study for and pass the many exams required for Associate or full Fellowship in these two societies.

DFA Modeling Concentration

The concentration is designed to give students a solid risk management foundation, including basic risk management skills in finance, math, and modeling plus training in enterprise risk management. The four graduate level finance electives will further enhance the student's expertise in modeling and programming for asset liability management, financial instruments, and econometric analysis of financial variables and capital markets. The curriculum is designed for students with computer science backgrounds but covers a vast majority of the CFA Institute's body of knowledge as well as that of the Society of Actuaries and Casualty Actuarial Society, so should help students be well prepared to study for and pass the various exams required for professional designations from the three organizations should they wish to pursue these career paths.

Sample program schedules for each concentration are found in Appendix F for each concentration for full- and part-time students, and for those who must take the foundation courses. Students must maintain a 3.0 GPA in the program. At the end of each semester, any students with less than a 3.0 will receive a warning and must bring the average back up to a 3.0 or be dismissed from the program.

A. Graduate Foundation Courses

Students who enter the program without the appropriate prerequisite courses (listed above under Admissions) must take some or all of the graduate foundation courses before taking the required risk management courses.

a. Basic Foundation Courses

The following courses (total of 15 credits) must be taken by all students entering the M.S. in Risk Management, except as noted below under Admissions. If required, basic graduate foundation coursework must be taken prior to enrolling in RM 701, 702, 704, or 705. Some electives may be taken while graduate foundation coursework is being completed, if all prerequisites have been met. With permission of the director, individual courses may be waived for those students that have taken equivalent courses as part of their undergraduate program. Students who have completed an undergraduate degree in accounting or any of the B.B.A. majors at Queens College will be exempt from these Graduate Foundation Courses.

ECO 601 Introduction to Micro and Macro Economics (Fall) (4 credits)

Students who have taken ECO 101 and 102 or equivalent are exempt.

ECO 602 Introduction to Corporate Finance and Money and Banking (Spring) (4 credits)

Prerequisite ECO 601, Introduction to Micro and Macro Economics, or ECO 101 and 102 or equivalent. Students who have taken ECO 215 and BUS 241 or equivalent are exempt.

ECO 649 Statistics as Applied to Economics and Business (Spring) (3 credits)

Students who have taken ECO 249 or equivalent are exempt.

ACC 600 Financial Accounting Theory and Practice, Part 1 (Fall) (4 credits)

Students who have taken ACC 101 and 102 or equivalent are exempt.

b. Additional Graduate Foundation Courses for Accounting/CPA Concentration

Students wishing to enter the Accounting/CPA concentration must complete the following additional foundation courses. Students with an undergraduate degree in Accounting or who have taken the appropriate undergraduate courses will be exempt from these additional graduate foundation courses.

ACC 601 Financial Accounting Theory and Practice-Part 2 (4 credits) (Spring)

Students who have taken ACC 201 and 202 or equivalent are exempt.

ACC 602 Financial Accounting Theory and Practice-Part 3 (3 credits) (Fall)

Students who have taken ACC 311 or equivalent are exempt.

ACC 603 Concepts of Managerial Accounting (Spring) (4 credits)

Students who have taken ACC 305 and 306 or equivalent are exempt.

ACC 604 Concepts of Auditing and Computer Auditing (4 credits)

Students who have taken ACC 321 and 322 or equivalent are exempt.

ACC 605 Introduction to Business Law (4 credits)

Students who have taken ACC 261 and 362 or equivalent are exempt.

ACC 606 Federal and New York State Taxes on Income (4 credits)

Students who have taken ACC 367 or equivalent are exempt.

CSCI 688 Advanced Productivity Tools for Business (3 credits)

Students who have taken CSCI 012 or 018 are exempt.

Total of 26 credits

Students who have successfully completed the appropriate graduate foundation courses for their concentration as described above (i.e. with a minimum GPA of 3.0) must then complete at least 30 additional graduate credits with a minimum overall GPA of 3.0. Students whose GPA in the program falls below 3.0 will be placed on probation, and will not be permitted to register if the GPA is not brought back up after one semester. Appeals may be made to the Risk Management Faculty Advisory Committee (see above). Only one course may be retaken for grade replacement.

B. Required courses in Risk Management

The following courses are required of all M.S. in Risk Management students. All courses are 3 credits.

RM 701 Enterprise Risk Management (Fall)

*Prerequisite completion of basic graduate foundation coursework.***RM 702** Accounting for Risk Management (Fall)

Pre- or co-requisite RM 701, Enterprise Risk Management (Fall). Students in the Accounting/CPA Concentration should not take RM 702 and must take an additional elective in their concentration.

RM 704 Risk Measurement (Fall)

Pre- or co-requisite RM 701, Enterprise Risk Management (Fall).

RM 705 Risk Transfer to Financial Markets (Spring)

Prerequisite RM 701, Enterprise Risk Management (Fall), RM 703, Investment Analysis, or RM 704, Risk Measurement (Fall), or BUS 350, Investment Analysis. Students who have taken BUS 353, Options and Futures Markets, will not receive credit for RM 705, Risk Transfer to Financial Markets, and must choose an additional elective in their concentration.

RM 706 Risk Transfer to Insurance Markets (Fall, Spring)

Prerequisite: undergraduate degree in accounting or finance or completion of basic graduate foundation coursework or equivalent.

RM 790 Applied Dynamic Financial Analysis (capstone) (Fall)

Prerequisite RM 701, Enterprise Risk Management (Fall), 702, Accounting for Risk Management (Fall) (Accounting/CPA concentrators are exempt), 704, Risk Measurement (Fall), 705, Risk Transfer to Financial Markets (Spring), 706, Risk Transfer to Insurance Markets (Fall, Spring), and 21 credits in RM program.

Note: For students in the Accounting/CPA concentration, RM 704, Risk Measurement (Fall), satisfies the New York state requirement for a quantitative measurements course, RM 705, Risk Transfer to Financial Markets (Spring), satisfies the New York state requirement for a finance course, and RM 706, Risk Transfer to Insurance Markets (Fall, Spring), satisfies the New York state requirement for an economic analysis course.

In addition to the required courses, students must take the additional courses listed below for their chosen area of concentration.

C. Accounting/CPA Concentration

The Accounting/CPA concentration can be completed in between 30 and 71 credits. Students with an undergraduate background in accounting or the prerequisites listed above under “Admissions” can complete the program in 30 credits. In addition to the courses required of all RM students, Accounting/CPA students must take the five courses below. All are offered every term in the evenings. If an equivalent course has been taken at the undergraduate level, additional suggested courses are listed below.

a. Required:**Accounting 712** Advanced Financial Accounting Theory (Fall, Spring)

Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the M.S. in Accounting or for the M.S. in Risk Management Accounting/CPA Concentration or permission of the department.

Accounting 723 Advanced Auditing Theory and Practice (Fall, Spring)

Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the M.S. in Accounting or for the M.S. in Risk Management Accounting/CPA Concentration or permission of the department.

Accounting 747 Communications and Accountants (Fall, Spring)

Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the M.S. in Accounting or for the M.S. in Risk Management Accounting/CPA Concentration or permission of the department.

Accounting 752 Business Law (Fall, Spring)

Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the M.S. in Accounting or for the M.S. in Risk Management Accounting/CPA Concentration

or permission of the department. Not open to students who have taken ACC 363, Business Law 3. Risk Transfer to Insurance Markets (Fall, Spring). Those students must choose another elective.

Accounting 757 Taxation of Business Entities (Fall, Spring)
Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the M.S. in Accounting or for the M.S. in Risk Management Accounting/CPA Concentration or permission of the department.

b. Additional recommended electives:

Accounting 707 Contemporary Issues in Management Accounting (Fall, Spring)
Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the M.S. in Accounting or for the M.S. in Risk Management Accounting/CPA Concentration or permission of the department.

Accounting 748 Advanced Accounting Information Systems (Fall, Spring)
Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the M.S. in Accounting or for the M.S. in Risk Management Accounting/CPA Concentration or permission of the department.

RM 791 Dynamic Financial Analysis Modeling
Prerequisites RM 701 Enterprise Risk Management (Fall), RM 704, Risk Measurement (Fall), and either RM 705, Risk Transfer to Financial Markets (Spring) or RM 706, Risk Transfer to Insurance Markets (Fall, Spring).

RM 792 Special Topics in Risk Management

See Appendix F, Table F4, for a sample 150 credit program for a student with an undergraduate degree in Accounting, and completing the M.S. in Risk Management with an Accounting/CPA concentration, and Appendix G for a detailed description of how the M.S. in Risk Management satisfies the New York State requirements for preparation for Certified Public Accountancy.

D. Finance/CFA Concentration

The Finance/CFA concentration can be completed in between 30 and 45 credits. Students with an undergraduate background in finance can complete the program in 30 credits. In addition to the courses required of all M.S. in Risk Management students, Finance/CFA concentrators must take the four courses listed below. All will be offered at least once yearly in the evenings. If an equivalent course has been taken at the undergraduate level, additional suggested courses are listed below.

a. Required Courses

In addition to the courses required of all students, which introduce students to risk measurement and management, and risk transfer to both insurance markets and financial markets, the following courses will help students to prepare for the CFA Exams and will give students the skills needed for risk management positions in the financial services industry.

RM 707 Financial Statement Analysis (Fall)
Prerequisite RM 702, Accounting for Risk Management (Fall), or ACC 201, Intermediate Acct 1. Students who have taken Accounting 350, Financial Statement Analysis, or Business 250, Financial Statement Analysis for Non-accountants, will not receive credit for this course.

RM 708 Financial Econometrics (Fall)
Prereq: RM 704, Risk Measurement (Fall), ECO 721, Econometrics, or ECO 382, Intro Econometrics, or BUS 384, Forecast & Regression Analysis. Students who have taken BUS 386, Financial Econometrics, will not receive credit for this course.

RM 709 Portfolio Management (Spring)
Prerequisite RM 703, Investment Analysis or BUS 350, Investment Analysis. Students who have taken BUS 352, Investment Management, will not receive credit for this course.

RM 710 Fixed Income Instruments (Spring)

Prerequisites RM 703, Investment Analysis, or BUS 350, Investment Analysis, completion of basic graduate foundation coursework.

b. Additional recommended electives:

Students who have completed some of the above courses as undergraduates would be recommended to take RM 792, Special Topics in Risk Management. They would also be recommended to take mathematics electives and/or RM 791, Dynamic Financial Analysis Modeling (listed below).

RM 791 Dynamic Financial Analysis Modeling

Prerequisites RM 701, Enterprise Risk Management (Fall), RM 704, Risk Measurement (Fall), and either RM 705, Risk Transfer to Financial Markets (Spring), or RM 706, Risk Transfer to Insurance Markets (Fall, Spring).

E. DFA Modeling Concentration

The DFA Modeling concentration can be completed in between 30 and 45 credits. Students with an undergraduate background in computer science can complete the program in 30 credits. In addition to the courses required of all RM students, DFA Modeling concentrators must take the four courses listed below. All will be offered at least once yearly in the evenings. If an equivalent course has been taken at the undergraduate level, additional suggested courses are listed below.

a. Required Courses:

ECO 715 Advanced Corporate Finance (Fall, Spring)

Prerequisite: BUS 241, Corporate Finance, or equivalent. Students who have taken BUS 341, Intermediate Finance, will not receive credit for this course.

RM 703 Investment Analysis (Fall, Spring)

Prerequisite ECO 602, Introduction to Corporate Finance and Money and Banking (Spring) (4 credits), or BUS 241, Corporate Finance. Students who have taken BUS 350, Investment Analysis will not receive credit for this course.

CSCI 765 Computational Finance (Spring)

Prerequisites CSCI 700, Algorithms I; or, for students in the Risk Management Program, CSCI 314, Data Structures for Finance, or the equivalent, and Economics 649, Statistics as Applied to Economics and Business or the equivalent.

RM 791 Dynamic Financial Analysis Modeling

Prerequisites RM 701, Enterprise Risk Management (Fall), RM 704, Risk Measurement (Fall), and either RM 705, Risk Transfer to Financial Markets (Spring), or RM 706, Risk Transfer to Insurance Markets (Fall, Spring).

b. Additional Recommended Electives:

RM 708 Financial Econometrics (Fall)

Prereq: RM 704, Risk Measurement (Fall), ECO 721, Econometrics or ECO 382, Intro Econometrics, or BUS 384, Forecast & Regression Analysis. Students who have taken BUS 386, Financial Econometrics, will not receive credit for this course.

RM 792 Special Topics in Risk Management

Computer Science 780 Special Topics in Computer Science

F. Additional electives for all concentrations:

The following mathematics courses are recommended for students in all concentrations.

Mathematics 621 Probability

Prerequisite Math 201, Calculus, or equivalent and an introductory course in probability.

Mathematics 622 Operations Research

Prerequisite Math 241, Introduction to Probability and Mathematical Statistics, or equivalent.

Mathematics 633 Statistical Inference

Prerequisite Math 201, Calculus or equivalent and Math 611, Introduction to Mathematical Probability, or 621, Probability, or an undergraduate probability course which includes mathematical derivations.

Mathematics 635 Stochastic Processes

Prerequisite Math 611, Introduction to Mathematical Probability, or 621, Probability

Note 1: Electives not on the list may be substituted with permission of the program director.

Note 2: If all electives in the area of concentration are completed, the student should consult with a faculty advisor to choose additional courses.

ASSESSMENT

Learning Goals

The goal of the M.S. in Risk Management program is to teach and train students in risk management so that they (i) are sought after by industry, regulators, auditors, consultancies etc, and (ii) become effective professionals with enhanced career prospects who are able to contribute to employers' needs to manage risk. Key components of a graduate's likelihood of success depend upon:

- 1) Having marketable skills that the risk management degree either enhances or creates. This will depend on the student's chosen concentration area:
 - a. Accounting: Certification as a Chartered Public Accountant (CPA) and fluency with risk management concepts; appreciation of the internal control role played within an organization as a risk management technique; having a high comfort level with risk and return, risk measurement and deal structuring so as to be a more effective as a practicing auditor or accountant; experience with financial modeling software and estimation, measurement, and hedging techniques used by insurance and capital markets.
 - b. Finance: a Chartered Financial Analyst (CFA) or actuarial designation enhanced by fluency with portfolio theory and corporate finance and stochastic modeling of economic variables; asset-liability modeling skills; econometric modeling skills.
 - c. Dynamic Financial Analysis modeling: A Financial Risk Manager (FRM) designation enhanced by fluency with portfolio theory and corporate finance; large database management skills; programming skills; and modeling skills with economic and financial variables.
- 2) Having good communication skills, both oral and written and also possessing persuasive presentation skills.
- 3) Achieving the necessary professional accreditation (as listed above in (a), (b) and (c)). The program's curriculum covers most, if not all of the body of knowledge of the above mentioned three professional designations. Therefore, the Program itself will assist students in achieving these professional designations.

Measures of Success in Achieving Learning Goals

1. Success of students in capstone course
2. Placement of students into internships and employer satisfaction with interns
3. Placement of students into full time jobs
4. Placement of students into contract jobs
5. CFA pass rates, Levels 1, 2, 3
6. Actuarial exam pass rates, for each exam
7. FRM exam pass rate

Logistics of measurement and tracking

The capstone course is designed so that students will have to demonstrate that they have met the learning goals of the program. Students will work in teams, and their roles on the teams and the team assignments, will be chosen based on their chosen concentration, so they will have to show mastery of learning goals specific to their specialization. In addition, students are expected to demonstrate communications and presentations skills in the course of preparing and presenting the team report. Team reports will be assessed to determine (a) whether the overall program goals are

being met and (b) where goals specific to each concentration are being met.

Placement of students into internships will be tracked, and employers will be surveyed to report on their performance.

We expect to be able to track pass rates on professional examinations as well as job placement rates by tracking students post graduation. Keeping track of graduates will also benefit future students since our graduates will be a good source of job leads for newly graduating students.

FACULTY

Queens College possesses the core building blocks of a graduate risk management program: undergraduate degree programs in economics and finance, and graduate and undergraduate programs in accounting, mathematics and computer science. These resources can be leveraged in the following ways: (i) many existing courses are directly relevant to the risk management curriculum and would contribute to the degree requirements as-is; (ii) other courses are highly relevant but would require some modification to fit into the risk management curriculum; (iii) several courses would be new to the program but taught by existing faculty. In this case, the courses would replace other courses already being offered that have less student interest and demand. Finally, (iv) some new courses would need to be offered that might require new faculty hiring, although the department has already received one new faculty line to implement the new program. Our collective strength in the relevant fields will allow us to immediately implement the program, with faculty providing expertise in risk management (Dr. Diane Coogan-Pushner, Dr. Wendy Wang), finance and econometrics (Dr. Joan Nix, Dr. Magdalena Sokalska, Dr. Leanne Ussher, Dr. Tao Wang), accounting (Dr. Neil Hitzig, Dr. John Walker), computer science (Dr. Bojana Obrenic) and mathematics (Dr. William Emerson, Dr. Kenneth Kramer, Dr. Stefan Ralescu and Dr. Ronald Rothenberg). Faculty teaching assignments are found in Appendix H, and faculty curricula vitae are found in Appendix I.

COST ASSESSMENT

At this time, faculty resources required to launch the program have been funded and hired. Many courses required of students in the M.S. in Risk Management program are pre-existing courses already listed on the schedule, or can be cross-listed where appropriate, with existing courses. If courses are cross-listed with upper-level undergraduate courses, graduate students in the course will be expected to complete additional, more rigorous coursework. We do not anticipate that the program will interfere with current course offerings or faculty assignments in the Accounting, Economics and Computer Science Departments. New courses will be to some extent offset by a decrease in the number of courses currently taught in the Economics Department for the M.S. in Accounting, as courses in the M.S. in Risk Management program will also serve as requirements or electives for the M.S. in Accounting. However, in conjunction with the anticipated growth in the M.S. in Accounting when the 150 credit requirement for the CPA takes effect, we will need to offer additional sections of some courses and this will necessitate additional hiring in later years. Projections are shown in the table below. If the program grows more slowly than anticipated, hires may be postponed. Should the program grow beyond our predictions, or attract large numbers of additional students to the college and program, future investments in accounting and economics lines beyond those specified below might become necessary. Because admission to the program is by application, we have the ability to maintain a fixed number of students, regardless of number of applications; however it would be preferable to have the ability to expand the size of the program should student interest exceed current program capabilities. This could be accomplished through implementation of faculty lines hired through the CUNY Graduate Investment Initiative.

These costs are based on full-time enrollment for all students. If a substantial number of students attend part-time, the costs and revenues would be reduced initially, and needs for faculty hires might be delayed.

A. Faculty

The table below shows estimated needs for new faculty. Appendices J, K and L contain revenue and cost projections.

Category	Year 1	Year 2	Year 3	Year 4	Year 5
Total New Faculty Lines (cumulative)*					
Economics	0	1	2	2	2
Accounting**	0	0	1	1	1

Adjunct Hours					
Economics	45	45	0	0	0
Accounting**	135	270	45	45	45

* Includes new teaching time, direction of program, admissions and advising.

** The increase in needed time in Year 3 for Accounting necessitates the hiring of a new full time faculty member to teach in the new program and advise students in the Accounting/CPA track, reducing the need for adjunct time to 45 hours in Year 3 and after because of this hire.

B. Administrative Assistance

It is anticipated that a College Assistant will be needed to support the program at a total cost of \$10,000 per year.

C. Supplies

It is anticipated that \$500 per year will be necessary for making copies of flyers describing the Program and applications for admission. Although copies of the application will be made available via the home page for the Program, some students may prefer to pick up application materials in the Economics Department. Appendices E and F contain revenue and cost projections.

D. Facilities and Equipment

It is not anticipated that new facilities or equipment will be needed.

2. Accounting and Information Systems (G09-37)

From:

[Enterprise] Risk Management (“[E]RM”) 701 Enterprise Risk Management, 3 Hr; 3 Cr. Prerequisite: completion of graduate [core] curriculum for the MS in [Enterprise] Risk Management or permission of program director. The course provides a broad overview of why managing risk is important to organizations and of the risk management function. The course utilizes the ERM framework to identify sources of value and stakeholder objectives, to categorize events that pose risk, to determine the organization’s appetite for risk and to determine levels of risk retention. The course covers various risk types and examines how each is quantified, transferred, or retained and priced-for. The course is case study and group-study intensive.

To Read:

Risk Management (“RM”) 701 Enterprise Risk Management, 3 Hr; 3 Cr. Prerequisite: completion of graduate foundation curriculum for the MS in Risk Management or permission of program director. The course provides a broad overview of why managing risk is important to organizations and of the risk management function. The course utilizes the ERM framework to identify sources of value and stakeholder objectives, to categorize events that pose risk, to determine the organization’s appetite for risk and to determine levels of risk retention. The course covers various risk types and examines how each is quantified, transferred, or retained and priced-for. The course is case study and group-study intensive.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

[Enterprise] Risk Management (“[E]RM”) 702 Accounting for Risk Management, 3 Hr.; 3 Cr. Pre- or co-requisite [E]RM 701 Enterprise Risk Management. This course is intended to provide graduate level exposure to accounting theory for students enrolled in the MS in Risk Management program. The course will cover essentials of the conceptual framework of accounting and will focus on issues affecting recognition and measurement of the economic events that affect financial statements in particular, those that affect the firm’s risk profile and risk transfer. The course will not be open to MS in Accounting students. [E]RM 701, Enterprise Risk Management is a pre- or co-requisite.

Credit will not be given for this course if ACC 350 or BUS 250 has already been taken and students will be required to take an additional elective from the [E]RM program offerings.

To Read:

Risk Management (“RM”) 702 Accounting for Risk Management, 3 Hr.; 3 Cr. Pre- or co-requisite RM 701 Enterprise Risk Management. This course is intended to provide graduate level exposure to accounting theory for students enrolled in the MS in Risk Management program. The course will cover essentials of the conceptual framework of accounting and will focus on issues affecting recognition and measurement of the economic events that affect financial statements in particular, those that affect the firm’s risk profile and risk transfer. The course will not be open to MS in Accounting students. RM 701, Enterprise Risk Management is a pre- or co-requisite. Credit will not be given for this course if ACC 350 or BUS 250 has already been taken and students will be required to take an additional elective from the RM program offerings.

Justification: The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

[Enterprise] Risk Management (“[E]RM”) 703 Analysis of Investment and Market Risk, 3 Hr.; 3 Cr. Prerequisites: ECO 602 Introduction to Corporate Finance and Money and Banking or BUS 241 Corporate Finance; ECO 649 Statistics as Applied to Economics and Business; or equivalent as approved by the Program director.

To Read:

Risk Management (“RM”) 703 Analysis of Investment and Market Risk, 3 Hr.; 3 Cr. Prerequisites: ECO 602 Introduction to Corporate Finance and Money and Banking or BUS 241 Corporate Finance; ECO 649 Statistics as Applied to Economics and Business; or equivalent as approved by the Program director.

Justification: The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

[Enterprise] Risk Management (“[E]RM”) 706 Risk Transfer to Insurance Markets, 3 Hr.; 3 Cr. Prereq: Undergraduate degree in accounting or completion of Graduate [Core] Curriculum, [ECO 601 Introduction to Micro and Macro Economics; ECO 602 Introduction to Corporate Finance and Money and Banking; ECO 649 Statistics as Applied to Economics and Business; and ACC 600 Financial Theory and Accounting Practice, Part I,] or permission of program director. [E]RM 701, [Introduction to] Enterprise Risk Management is recommended. This course examines risk transfer to insurance markets. Topics covered will include the variety of ways that risk transfer can occur including quota share and excess of loss agreements, catastrophe bonds, captives, reciprocals, segregated cells, and their structuring, such as retentions, limits, corridors, collateralization, reinstatement, and commutation provisions, and structured/financial insurance. Insurance products will be evaluated for their efficiency in risk transfer. How effective insurance markets are relative to capital markets will be evaluated in terms of terms and conditions, pricing, and basis risk.

To Read:

Risk Management (“RM”) 706 Risk Transfer to Insurance Markets, 3 Hr.; 3 Cr. Prereq: Undergraduate degree in accounting or completion of Basic Graduate Foundation Curriculum, or permission of program director. RM 701, Enterprise Risk Management is recommended. This course examines risk transfer to insurance markets. Topics covered will include the variety of ways that risk transfer can occur including quota share and excess of loss agreements, catastrophe bonds, captives, reciprocals, segregated cells, and their structuring, such as retentions, limits, corridors, collateralization, reinstatement, and commutation provisions, and structured/financial insurance. Insurance products will be evaluated for their efficiency in risk transfer. How effective insurance markets are relative to capital markets will be evaluated in terms of terms and conditions, pricing, and basis risk.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management. A correction was made to the title of RM 701.

2From:

[Enterprise] Risk Management (“[E]RM”) 705 Risk Transfer to Financial Markets, 3 Hours, 3 Credits. Pre- or co-requisite: [E]RM 701, Introduction to Enterprise Risk Management; [E]RM 703 or BUS 350, Investment Analysis is recommended. The primary emphasis of this course is on the structure, pricing, hedging and strategies of futures and options contracts and their applications in a risk management context. The economic role of options and futures markets is examined. Specific topics include: determinants of forward and futures prices, option valuation using

binominal trees and Monte Carlo simulation, implied binominal trees, relation between puts and calls, uses of options in investment strategies, hedging techniques, exotic options, applications to corporate securities and other financial instruments.

To Read:

Risk Management (“RM”) 705 Risk Transfer to Financial Markets, 3 Hours, 3 Credits. Pre- or co-requisite: RM 701, Introduction to Enterprise Risk Management; RM 703 or BUS 350, Investment Analysis is recommended. The primary emphasis of this course is on the structure, pricing, hedging and strategies of futures and options contracts and their applications in a risk management context. The economic role of options and futures markets is examined. Specific topics include: determinants of forward and futures prices, option valuation using binominal trees and Monte Carlo simulation, implied binominal trees, relation between puts and calls, uses of options in investment strategies, hedging techniques, exotic options, applications to corporate securities and other financial instruments.

Justification: The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

[Enterprise] Risk [Measurement] (“[E]RM”) 704 Risk Measurement, 3 Hr.;3 Cr. Pre- or Co-requisite: [E]RM 701 Enterprise Risk Management. This course provides an in-depth review of the fundamentals of probability and statistics, followed by the measurement of various risk types. The course examines instances of market failure, the role of collateralization requirements, the impact of term, time horizon, and covariance, and extreme value theory. The course also covers probabilistic and stochastic risk modeling, calculations of value-at-risk, stress testing, and other risk metrics, and the limitations of each of these measures.

To Read:

Risk Management (“RM”) 704 Risk Measurement, 3 Hr.;3 Cr. Pre- or Co-requisite: RM 701 Enterprise Risk Management. This course provides an in-depth review of the fundamentals of probability and statistics, followed by the measurement of various risk types. The course examines instances of market failure, the role of collateralization requirements, the impact of term, time horizon, and covariance, and extreme value theory. The course also covers probabilistic and stochastic risk modeling, calculations of value-at-risk, stress testing, and other risk metrics, and the limitations of each of these measures.

Justification: The program was renamed Risk Management, instead of Enterprise Risk Management. Also, correction of earlier error in course name.

From:

[Enterprise] Risk Management (“[E]RM”) 710 Fixed Income Instruments,3 Hr.; 3 Cr. Prerequisites: ECO 602, Introduction to Corporate Finance and Money and Banking, or BUS 241, Corporate Finance. Recommended: Math 131, Calculus with Applications to the Social Sciences. The course exposes students to an in-depth analysis of the concepts encountered in the market for fixed income securities. The student will develop tools to price bond and money market instruments, understand the term structure of interest rates, analyze the Treasury yield curve, and evaluate credit yield spreads. The course illustrates hedging and other trading and portfolio strategies, and explores fixed income derivative instruments.

To Read:

Risk Management (“RM”) 710 Fixed Income Instruments,3 Hr.; 3 Cr. Prerequisites: ECO 602, Introduction to Corporate Finance and Money and Banking, or BUS 241, Corporate Finance. Recommended: Math 131, Calculus with Applications to the Social Sciences. The course exposes students to an in-depth analysis of the concepts encountered in the market for fixed income securities. The student will develop tools to price bond and money market instruments, understand the term structure of interest rates, analyze the Treasury yield curve, and evaluate credit yield spreads. The course illustrates hedging and other trading and portfolio strategies, and explores fixed income derivative instruments.

Justification: The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

[Enterprise] Risk Management (“[E]RM”) 790 Applied Dynamic Financial Analysis, 3 Hr.; 3 Cr. Prerequisites: [E]RM 701, [E]RM 702, [E]RM 703 or [E]RM 704, [E]RM 705 and [E]RM 706. The course may be taken concurrently with [E]RM 703 or 704 with permission of the program director. This is the capstone course for the [Enterprise] Risk Management program, in which students will run a dynamic financial analysis for a corporation, modeling its financial asset and liability exposures, and estimating future cash flow, time-varying exposures, and covariance across

exposures. Students will build models with applications either to pension funds, life insurance, non-life insurance, banking, and treasury/funding operations.

To Read:

Risk Management (“RM”) 790 Applied Dynamic Financial Analysis, 3 Hr.; 3 Cr. Prerequisites: RM 701, RM 702, RM 703 or RM 704, RM 705 and RM 706. The course may be taken concurrently with RM 703 or 704 with permission of the program director. This is the capstone course for the Risk Management program, in which students will run a dynamic financial analysis for a corporation, modeling its financial asset and liability exposures, and estimating future cash flow, time-varying exposures, and covariance across exposures. Students will build models with applications either to pension funds, life insurance, non-life insurance, banking, and treasury/funding operations.

Justification: The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

[Enterprise] Risk Management (“[E]RM”) 791 Applied Financial Dynamic Analysis Model Building, 2 hr. plus conf.; 3 cr. Prerequisite: [E]RM 790, Applied Dynamic Financial Analysis. In this course, students will contribute to the building and development of Dynamic Financial Analysis (DFA) models tailored to a financial institution, non-financial corporation, or pension fund. The DFA model is an asset-liability management model in which an organization’s asset and liability values are forecasted over time and simulated by allowing economic, financial, and other business drivers of the cash flows to vary stochastically, in a dynamic and simultaneous fashion, using Monte Carlo and other simulation methods. The course is open to students only by permission of the Program Director.

To Read:

Risk Management (“RM”) 791 Applied Financial Dynamic Analysis Model Building, 2 hr. plus conf.; 3 cr. Prerequisite: RM 790, Applied Dynamic Financial Analysis. In this course, students will contribute to the building and development of Dynamic Financial Analysis (DFA) models tailored to a financial institution, non-financial corporation, or pension fund. The DFA model is an asset-liability management model in which an organization’s asset and liability values are forecasted over time and simulated by allowing economic, financial, and other business drivers of the cash flows to vary stochastically, in a dynamic and simultaneous fashion, using Monte Carlo and other simulation methods. The course is open to students only by permission of the Program Director.

Justification: The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

ACC 707 Contemporary Issues in Management Accounting. 3 hr.; 3 cr. Prereq: Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate [core] coursework for the MS in Accounting or the MS in [Enterprise] Risk Management Accounting/CPA concentration or permission of the department. The purpose of this course is to build upon the basic concepts of management accounting introduced in Accounting 305/306. The most current theories and practices that comprise Accounting 707 have been developed over the past decade in response to rapid changes in the external and internal environment that business organizations face. Accounting 707 will examine in depth the most recent management accounting literature with respect to: 1) information that managers need for decision making, and 2) the role of the management accounting in the accumulation, analysis, and use of that information.>

To Read:

ACC 707 Contemporary Issues in Management Accounting. 3 hr.; 3 cr. Prereq: Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the MS in Accounting or the MS in Risk Management Accounting/CPA concentration or permission of the department. The purpose of this course is to build upon the basic concepts of management accounting introduced in Accounting 305/306. The most current theories and practices that comprise Accounting 707 have been developed over the past decade in response to rapid changes in the external and internal environment that business organizations face. Accounting 707 will examine in depth the most recent management accounting literature with respect to: 1) information that managers need for decision making, and 2) the role of the management accounting in the accumulation, analysis, and use of that information.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management.

From

ACC 712, Advanced Financial Accounting Theory. 3 hr.; 3 cr. Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate [core] coursework for the MS in Accounting or the MS in [Enterprise] Risk Management, Accounting/CPA concentration or permission of the department. The emphasis of this course is on the examination of current issues and research methodologies related to accounting theory in such areas as the objectives of financial statements, financial statement elements, asset-valuation concepts, income-determination models, and cutting edge topics under scrutiny by the accounting profession. Students will analyze the literature in accounting theory relating to current pronouncements of the Financial Accounting Standards Board and prior pronouncements of the Accounting Principles Board and Committee on Accounting Procedure. A primary focus will be the application and influence of accounting theory on the development of current Generally Accepted Accounting Principles and corporate financial reporting.

To Read:

ACC 712, Advanced Financial Accounting Theory. 3 hr.; 3 cr. Prereq: Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the MS in Accounting or the MS in Risk Management, Accounting/CPA concentration or permission of the department. The emphasis of this course is on the examination of current issues and research methodologies related to accounting theory in such areas as the objectives of financial statements, financial statement elements, asset-valuation concepts, income-determination models, and cutting edge topics under scrutiny by the accounting profession. Students will analyze the literature in accounting theory relating to current pronouncements of the Financial Accounting Standards Board and prior pronouncements of the Accounting Principles Board and Committee on Accounting Procedure. A primary focus will be the application and influence of accounting theory on the development of current Generally Accepted Accounting Principles and corporate financial reporting.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

ACC 723, Advanced Auditing theory and Practice. 3 hr.; 3 cr. Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate [core] coursework for the MS in Accounting or the MS in [Enterprise] Risk Management Accounting/CPA concentration or permission of the department. This course focuses on the philosophical aspects of the professional accountant's relationship with clients and third parties. Accordingly, the Code of Professional Conduct issued by the American Institute of CPAs (AICPA) is examined in detail. The auditing pronouncements issued by the AICPA are analyzed in detail. Requirements of the Securities and Exchange Commission are also explored. Other areas scrutinized are compilation and review, attestation engagements, statistical sampling and auditing in an electronic data processing environment. The case method is used in solving problems of a more complex nature.>

To Read:

ACC 723, Advanced Auditing theory and Practice. 3 hr.; 3 cr. Prereq: Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the MS in Accounting or the MS in Risk Management Accounting/CPA concentration or permission of the department. This course focuses on the philosophical aspects of the professional accountant's relationship with clients and third parties. Accordingly, the Code of Professional Conduct issued by the American Institute of CPAs (AICPA) is examined in detail. The auditing pronouncements issued by the AICPA are analyzed in detail. Requirements of the Securities and Exchange Commission are also explored. Other areas scrutinized are compilation and review, attestation engagements, statistical sampling and auditing in an electronic data processing environment. The case method is used in solving problems of a more complex nature.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

ACC 747. Communications and Accountants. 3 hr.; 3 cr. Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate [core] coursework for the MS in Accounting or the basic

core coursework for the MS in [Enterprise] Risk Management or permission of the department. The examination both verbally and non-verbally, of communications required in the business life of an accountant. The objectives of this course will be to enhance the ability to write, speak, and listen more effectively in the business environment. Topics covered will be writing a resume and a job application for an accounting position, writing instructions to staff for an audit, writing a letter to a client on the results of an audit, preparing an analysis of an annual report, communicating during an interview and a business meeting, listening skills, and preparing a financial presentation with multimedia aids.

To Read:

ACC 747. Communications and Accountants. 3 hr.; 3 cr. Prereq: Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the MS in Accounting or the basic core coursework for the MS in Risk Management or permission of the department. The examination both verbally and non-verbally, of communications required in the business life of an accountant. The objectives of this course will be to enhance the ability to write, speak, and listen more effectively in the business environment. Topics covered will be writing a resume and a job application for an accounting position, writing instructions to staff for an audit, writing a letter to a client on the results of an audit, preparing an analysis of an annual report, communicating during an interview and a business meeting, listening skills, and preparing a financial presentation with multimedia aids.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

ACC 748. Advanced Accounting Information Systems. 3 hr.; 3 cr. Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate [core] coursework for the MS in Accounting or the MS in [Enterprise] Risk Management Accounting/CPA concentration or permission of the department. Methods and techniques of using accounting as an information system. The design, analysis, installation, and evaluation of a system, either manual or computer-based, will be covered. Topics will include accounting systems theory, design theory, accounting file structure, implementation, maintenance, and evaluation of the system. General ledger software and database programs will be discussed and used in the classroom. The use of the Internet and expert systems as they relate to accounting information will be included.

To Read:

ACC 748. Advanced Accounting Information Systems. 3 hr.; 3 cr. Prereq: Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the MS in Accounting or the MS in Risk Management Accounting/CPA concentration or permission of the department. Methods and techniques of using accounting as an information system. The design, analysis, installation, and evaluation of a system, either manual or computer-based, will be covered. Topics will include accounting systems theory, design theory, accounting file structure, implementation, maintenance, and evaluation of the system. General ledger software and database programs will be discussed and used in the classroom. The use of the Internet and expert systems as they relate to accounting information will be included.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

ACC 752, Advanced Studies in Business Law. 3 hr., 3 cr. Open to students who have completed an undergraduate program in Accounting or who have completed the graduate [core] coursework for the MS in Accounting or the MS in [Enterprise] Risk Management Accounting/CPA concentration or permission of the department. The course examines the Uniform Commercial Code, with particular emphasis on sales, law, commercial paper, and the laws of secured transactions. Laws relating to bankruptcy, suretyship, as well as laws specifically applicable to accountants' professional responsibilities, including securities laws and corporate governance, will also be examined.

To Read:

ACC 752, Advanced Studies in Business Law. 3 hr., 3 cr. Prereq: Open to students who have completed an undergraduate program in Accounting or who have completed the graduate foundation coursework for the MS in Accounting or the MS in Risk Management Accounting/CPA concentration or permission of the department. The course examines the Uniform Commercial Code, with particular emphasis on sales, law, commercial paper, and the laws of secured transactions. Laws relating to bankruptcy, suretyship, as well as laws specifically applicable to

accountants' professional responsibilities, including securities laws and corporate governance, will also be examined.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management.

From:

ACC 757. Taxation of Business Entities, 3 hr.; 3 cr. Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate [core] coursework for the MS in Accounting or the MS in [Enterprise] Risk Management Accounting/CPA concentration or permission of the department. This course focuses on the taxation of the primary forms of business entities: sole proprietorships, corporations, including S corporations, and partnerships, including limited liability companies (LLCs). The decision process necessary to select a particular type of business entity as well as the tax advantages and disadvantages inherent in the operations, liquidation, and termination of these entities will be stressed. Emphasis is placed on tax planning, problem solving, and research.

To Read:

ACC 757. Taxation of Business Entities, 3 hr.; 3 cr. Prereq: Open to students who have completed an undergraduate degree in Accounting or who have completed the graduate foundation coursework for the MS in Accounting or the MS in Risk Management Accounting/CPA concentration or permission of the department. This course focuses on the taxation of the primary forms of business entities: sole proprietorships, corporations, including S corporations, and partnerships, including limited liability companies (LLCs). The decision process necessary to select a particular type of business entity as well as the tax advantages and disadvantages inherent in the operations, liquidation, and termination of these entities will be stressed. Emphasis is placed on tax planning, problem solving, and research.

Justification: The graduate core courses, which were prerequisite courses for the required courses in risk management were renamed graduate foundation courses for clarity. The program was renamed Risk Management, instead of Enterprise Risk Management.

3. Computer Science (G09-38)

CSCI 765; Computational Finance. 3 hr.; 3 cr.

Prereq.: CSCI 700, or the equivalent of CSCI 314 and Econ 249 for students in the Enterprise Risk Management Program. Valuation of financial derivatives is presented as a family of algorithmic computations, centering on understanding and implementation of about fifty selected algorithms. Concepts include time value of money; market risk and credit risk; arbitrage; forwards and futures on stock, currencies, interest-rates, indices, commodities; collateral, marking-to-market, margining, netting; fundamentals of capital asset pricing; yield curves, bond prices, forward rates; swaps; options, claim synthesis; binomial trees; Weiner processes, Itô's Lemma, Black-Scholes-Merton model for options; Greeks; implied volatility and term structure; credit risk, estimates of credit default probabilities, credit default spreads and default intensities; introduction to some path dependent and exotic derivatives.