Professional Master of Financial Economics (MFE)

INTRODUCTION

1.1 Overview of the New Program

The Master of Financial Economics (MFE) is a course-based professional master's program delivered over four terms. The program will provide graduates with the quantitative and analytical skills required to pursue careers in the financial industry, in both private and public sector institutions. The roles for program graduates in these institutions would be wide-ranging, and include: roles in the investment management division of pension funds, researchers in financial services institutions dealing with risk management and the pricing of complex securities, as well as tactical asset management.

The Department of Economics will serve as the "home department", and the MFE program will be a cross-disciplinary program, with courses offered by the Department of Economics, the Ivey School of Business, the Department of Applied Mathematics, the Department of Statistical & Actuarial Sciences and the Faculty of Law. The regular administrative duties of the program will be coordinated by the MFE Director, who would typically be a member of the Economics Department, (although other faculty cross-appointed in Economics will also be eligible). An MFE Administrative Committee with representatives from Ivey, Science and Law will work closely with the Director to coordinate the program.

The program objective is to provide students with the broad knowledge base and integrated set of skills required in many finance related careers. Many careers in modern finance require an understanding of economic concepts and models in order to grasp the increasingly complex workings of modern financial markets. Further, many positions in the financial sector now require at least a basic understanding of the mathematical models used to price assets, evaluate risk, and manage complex asset portfolios. The MFE will provide students with these skills.

As a cross-disciplinary program, the MFE will help the University follow through on the following commitments laid out in `*Engaging The Future'*:

- 'to significantly increase Masters-level students at Western from the base-line of 2000-01 by 2010-11, and continue a strong rate of graduate expansion thereafter.'

- 'Facilitate and support interdisciplinary and cross-University engagement in the development of new graduate programs.'

On a broader scale, the MFE will further the University's Strategic priorities by devoting resources to two of the three key areas identified in the `Setting Directions' segment of *Engaging the Future.* These are:

- Expanding and enriching the experience of graduate students in an environment supportive of academic, professional and personal growth.

And,

- Building the research university through strategic investment in areas of established and emerging research strength, as identified in the Faculty Academic Plans and the University's Research Plan. Western's aspirations in research will be realized through attention to faculty recruitment and retention**,** recruitment of postdoctoral fellows**,** emphasis on graduate programs and enrollment, and construction and renovation of appropriate space.

Further, it is important to note that one of the 10 Signature areas identified in the University's Research Plan is:

- **Business**, as indicated by global reputation and ranking success of the Ivey School of Business, and the achievements of our faculty in areas related to the study of management and economics.

As detailed below, the MFE will provide training and skills in aspects of Finance and Economics that are not provided to graduates of existing post-graduate programs at Western.

1.2 Goals and Objectives of the Program in Relation to the Graduate Degree Level Expectations

Master's Level:

The program objective is to provide students with the broad knowledge base and integrated set of skills required to succeed in finance related careers. Many careers in modern finance require an understanding of economic concepts and models in order to grasp the increasingly complex workings of modern financial markets. Further, many positions in the financial sector also require a basic understanding of the mathematical models used to price assets, evaluate risk, and manage complex asset portfolios as well as key features of securities regulation. The MFE will provide students with these skills.

a) Depth and Breadth of Knowledge

With courses drawn from four distinct disciplines, the program is designed to provide students with a breadth of knowledge across areas that are critical to a deep understanding of financial markets. The core economics courses in Microeconomics, Macroeconomics, Financial Economics and Econometric theory are designed to provide students with a quantitative and qualitative understanding of economic theory that underpins modern portfolio theory, asset pricing, financial regulation and business cycles (e.g. the consumption capital asset pricing model, financial factors in business cycle models). The elective courses in Economics provide more detailed exposure to empirical techniques used in the analysis of financial time series, the economic forces driving the long run evolution of financial system and financial crises, and the economic theory of financial regulation. The Ivey Finance courses build on the economic theory, and provide students with the institutional background knowledge and theory of corporate finance, as well as the application of econometric techniques to financial market data. The required courses from Applied Mathematics and Statistics and Actuarial Science will provide students with the quantitative skills required to apply the theory developed in the Economic and Finance courses to price financial assets. Finally, the Law course will provide students with essential background knowledge on the workings of securities law required to price assets and manage regulatory risk. In addition, a seminar featuring speakers already working in the field will provide students with critical awareness of problems and issues which are of current importance for financial practitioners.

b) Research and Scholarship

This is a professional program, but all courses will be taught by faculty who are active researchers in relevant fields. The coursework has been designed to provide graduates with the ability to undertake critical evaluation of current and advanced research in the discipline(s) required for professional competence. Courses are also designed to insure graduates will be able to develop sustained written analysis and argument, as well as the application of quantitative tools to the problems faced by financial practitioners.

c) Level of Application of Knowledge

The mix of courses from highly analytic disciplines is specifically designed to provide students with the ability to apply existing analytical tools from those disciplines to analyse new questions and issues which arise in their regular professional activities. This will require a level of quantitative and analytic rigour significantly above that expected in undergraduate courses in Economics and Finance.

d) Professional Capacity / Autonomy

The breadth of coursework required is designed to give graduates the confidence to make critical decisions in highly complex situations, such as those required in risk management as well as those required to assess systemic risk. The coursework will also emphasize the importance of behaviour consistent with both legal and ethical guidelines in finance.

e) Level of Communication Skills

The inclusion of courses in Law and on the History of Financial Markets will enhance the students' communication skills, enabling them to communicate with professionals with less technical backgrounds than their own. The cross-disciplinary nature of the courses will enable students to develop the skills and

terminology to communicate with professionals from a range of disciplines, facilitating their professionalization and broadening their career scope.

f) Awareness of Limits of Knowledge

The History of Financial Markets course is designed to emphasize to graduates that it is not the case that `all the questions have now been answered'. The seminar course will feature professionals working in the field, which also emphasize the limits of knowledge in the face of an ever-changing environment.

1.3 Consultation Process in the Preparation of the Brief, Including Faculty and Student Input and Involvement

The program was developed by a working group of Faculty members in Economics, Ivey, Applied Mathematics, Statistics and Actuarial Science and Law. During the process, feedback on the proposed program was sought from the Chairs/Deans, Ivey placement office as well as Dean's offices. In addition, positive feedback on the proposal has been received from Paul Jenkins (a member of the Western Board of Governors), who also circulated the proposal among senior officers at the Bank of Canada.

1.4 Evidence to Support the Introduction of the Program

The main pool of potential students would be graduates of undergraduate Honors programs in Economics and Business Administration with solid quantitative skills (i.e. demonstrated familiarity with calculus, statistics and quantitative models). Students with undergraduate Honors degrees in quantitative areas such as Statistics, Applied Math, Physics, Mathematics and Engineering will also be considered for admission.

The placement market includes private financial institutions such as banks, pension funds, and asset-management firms. In addition, public-sector organizations dealing with financial markets will be targeted, including The Bank of Canada, the Ontario Securities Commission, and the CPP Investment Board. Recruiters from various parts of the financial services industry have expressed interest in students whose skill set includes an understanding of both the practice and mathematics of finance, as well as the basic economics that underlies the working of financial markets. This is the market niche this program will fill.

Comparisons with Other Existing Programs

The University of Toronto (U of T) has an MFE program that is jointly offered by the Department of Economics and the Rotman School of Business. The MFE program proposed here differs as it includes core and elective courses from Applied Mathematics and Actuarial Science dealing with the technical aspects of financial modelling. The U of T program, by contrast, consists entirely of courses from Economics and Business. Further, the proposed program includes as part of its curriculum a course in Securities Regulation offered by the Law School and an Economics course in Financial Intermediation and Regulation. Thus, the proposed program will give *all* of its graduates more extensive training in the technical, quantitative aspects of financial modelling and markets, as well as in the regulation of financial markets.

Several universities in Ontario (including Waterloo, U of T, McMaster, York and Queens) also offer a Master's degree in Quantitative Finance/Financial Engineering. However, these programs are typically targeted at students with more mathematical and computing background than the target MFE students and provide students with limited training in economic fundamentals. As a result, graduates of these programs tend to be placed in very technical banking and finance roles, which require significant mathematical and computational training but do not require a 'big picture' understanding of the entire banking system. MFE students, in contrast, will receive enough mathematical training to be able to communicate with Quantitative Finance type professionals, but the addition of a significant amount of economics training in the MFE will enable them to conduct the economic analysis required to capture the big picture.

The Masters in Financial Economics (MFE) program proposed here also shares some features with other Master's level programs currently being offered at Western. However, this does not represent duplication of programs, as they are all intellectually distinct and aimed at different student groups. The presence on

campus of other students in somewhat cognate areas is, in our view, a major benefit of this program, and from which we plan to draw advantages.

The other programs on campus are: the Masters in Business Administration (MBA) offered by the Richard Ivey School of Business, the Masters (of Science) in Financial Modeling (MFM) jointly offered by the Departments of Applied Mathematics and Statistical & Actuarial Sciences in the Faculty of Science, the professional Masters in Actuarial Science (pMAS) currently being proposed by the Department of Statistical & Actuarial Sciences and the Masters of Economics (MA) offered by the Department of Economics.

While these programs attract students interested in financial job opportunities, each of these five programs have different goals and are offered to different students (It should be noted that the big 6 banks employ hundreds of such professionals in Toronto alone, so there are many such jobs to go around).

The Ivey MBA program is designed to train well-rounded managers and therefore offers training in all aspects of modern business. While this includes some finance and some quantitative modelling, the MBA offers neither the same depth nor breadth of financial study as the MFE.

The pMAS, while again containing some training in financial markets, has as its main focus the study of actuarial pricing and risk related to mortality rates and so is quite distinct from the proposed MFE.

The MA in Economics program currently offered by the Department of Economics is designed to train economists, either in macroeconomics or microeconomics. While MFE and MA graduates will share a common base in economic theory, the MA in Economics offers neither the same depth nor breadth of financial study as the MFE.

Perhaps closest in scope of the three related programs is the MFM program which shares 2-3 courses with the proposed MFE. However, the MFM program is aimed at students with more mathematical and computing background than the target MFE students. Further, the MFM students do not receive training in economic fundamentals. MFM students tend to be placed in very technical banking and finance roles including risk management, banking analytics, and pricing and hedging. These roles require significant mathematical and computational training but do not require a ‘big picture’ understanding of the entire banking system, or of how financial markets interact with the rest of an economic system. MFE students, in contrast, will receive enough mathematical training to be able to communicate with MFM type professionals, but the addition of a significant amount of economics training in the MFE will enable them to conduct the economic analysis required to capture the big picture.

The recent financial crisis has brought into sharp relief the need for professionals who both see the big picture and have a well-developed understanding of the technical details of increasingly quantitative financial market products - training such professionals is the goal of our MFE program.

Describe the unique aspects of the proposed program that would be attractive to potential students. Describe how the proposed program addresses a societal need for graduates in the field/area.

Programs such as the MFE that integrate MA level studies in Economics, Finance and Applied Mathematics are relatively rare. In Ontario, only the University of Toronto offers a similar program (although other universities offer more focused programs such as a Master of Financial Engineering). The differences between the proposed MFE and that offered by the University of Toronto are addressed above, as are the reason graduates of such a program fill a societal need.

It is also worth noting that the demand for programs similar to the MFE program has increased as a result of the growth in the importance and complexity of modern finance, which has increased both the depth and breadth of skills needed.

1.5 Special Matters and Innovative Features

The program is a cross-disciplinary program involving departments in four faculties (see Section 2.5 for a discussion of shared resources). In addition, we plan to work actively with private and public sector partners to help place students in career related summer internships and to run a seminar course where

practitioners (from private industry and public institutions such as the Bank of Canada) provide students with exposure to practical challenges in integrating theory with practice.

As part of the effort to work with public and private sector partners, the MFE Administrative structure will include an Advisory Board comprised of representatives from the Financial Industry as well as the university. This advisory board will meet at least annually to provide feedback on program structure and curriculum, as well as to make recommendations on how to improve the program. The proposed board would be comprised of 13-18 members, with 7-12 from industry, 4 faculty members who lecture in the MFE program (one of whom is the MFE Director, and no more than two from any one Department), the Dean of Ivey (or their designate), the Dean of Science (or their designate), and the Dean of Social Science (or their designate). In addition to providing important feedback on the program, industry members of the advisory board will be encouraged to provide summer intern positions for students in the MFE program between their second and third semesters in the program.

1.6 Accreditation of the Professional Program

There currently is not a professional designation for the proposed program.

1.7 Indicate Whether the Program, or Part of the Program, will be offered Off-Campus or On-Line

The program will be offered on-campus.

4. PROGRAM REGULATIONS AND COURSES

The Intellectual Development and the Educational Experience of the Student

As noted above, the program will include a third semester seminar course with lectures from practitioners in private industry and the public sector. Faculty members from different disciplines within the program will be actively involved in this course

Program Regulations:

Recruitment Methods

Applications will be accepted via the online application system used by the Economics department. To recruit applicants, the program will develop a website and recruiting pamphlets and posters and distribute these materials to a targeted audience.

These materials will describe the MFE program, emphasizing its distinctive cross disciplinary features as well as the careers to which the MFE program leads. Once the program has graduated its first cohort, the materials will also include testimonials from former students.

The materials will be publicized as follows. Links to the website will be placed on the website of all participating departments (Ivey, Law, Economics, Applied Math, and Statistical & Actuarial Sciences) and efforts will be made to get the website listed in online directories of Masters of Financial Engineering and Masters in Financial Economics programs. Of course, the website will also be noted in the recruiting pamphlets and posters, which will be distributed to economics, business, math, statistics, physics, and engineering programs across Canada. In addition, the MFE director will liaise with School of Graduate and Postdoctoral Studies staff engaged in recruiting efforts as well as with graduate directors and department chairs in the participating departments. Information nights will be established and publicized both at Western and in cities with significant recruiting potential such as Toronto and Vancouver, and possibly even Hong Kong, Shanghai, Beijing and some major Indian centres.

Admission Requirements

For admission to the Master's program, applicants must possess an Honours BA/BSc or international equivalent i.e. four-year degree from an accredited university. The program requires at least a 78% overall average in the last two full-time years of the undergraduate degree. Equivalent qualifications may be considered based on the standards of the discipline or profession. Applicants with work experience in the financial industry who lack either the required admission average or some of the prerequisite course background may be admitted based on their work performance. However, as a condition of admission,

these applicants may be required to complete preparatory courses before enrollment in the program. Candidates with a 3 year general degree are not eligible.
The core courses in the graduate program are taught using mathematical techniques. Candidates are expected to have as a minimum, one semester each of university calculus and linear algebra with at least a B+ level of understanding. Candidates with an Economics or Business undergraduate degree should have achieved a B+ standing in an undergraduate econometrics course (level of Wonnacott and Wonnacott, Introductory Statistics for Business and Economics), as well as completed undergraduate courses in both intermediate and advanced microeconomics and macroeconomics.

Candidates with a BSc (i.e. Physics, Computer Science, Mathematics) are also eligible (and encouraged) to apply. BSc candidates should have achieved a B+ standing in an undergraduate Statistics courses, and have completed two years of calculus.

No application will be considered until it is complete. The responsibility rests with the applicant to ensure that all documents (i.e. transcripts, letters of reference, test results) are submitted by the program's deadline for application.

Applications will not be processed until January. The MFE Assessment Committee will not review applicants until after the February 1st deadline. The results of their decisions will not be known until late February-early March.

Program Requirements

The program curriculum is a four term course-based Masters program combined with a summer internship (or research project). Nine of the twelve lecture courses plus a senior seminar are required: Econ 9501A -Micro 1, Econ 9503A- Macro 1, Econ 9536 Fin Econ 1, Econ 9505A - Econometrics I, Applied Math 9578: Financial Options, Actuarial Science 9022A - Introduction to Financial Markets and Quantitative Finance with Excel, Business 811 Empirical Methods in Financial Economics, Business 821 Corporate Finance, Law 5560 - Securities Regulation. In addition, students must complete the summer internship (or research project and Econ 9599: Senior Seminar.

The remaining three electives may be chosen from a list of courses in Applied Math, Statistics and Actuarial Science, Economics or Finance (See below for the complete list of courses). However, to satisfy prerequisites, we outline two recommended course sequences (see summary Tables below). Course sequence A is slightly more quantitative focused, and requires the completion of Applied Math 9578: Financial Options in the first term. Course sequence B is more economic intensive, and involves the completion of Applied Math 9578: Financial Options in the third semester. Recommended elective courses will be available most years, although some elective courses may occasionally not be offered.

Recommended Course Sequence A

Term I -- Fall	**Term II -- Winter**	**Term III -- Fall**
Econ 9501A -Micro 1	Econ 9536 Fin Econ 1	Business 811 Empirical Methods in Financial Economics Or Business 821 Corporate Finance
Econ 9503A- Macro 1	Business 811 Empirical Methods in Financial Economics Or Business 821 Corporate Finance	Law 5560 - Securities Regulation
Applied Math 9578: Financial Options	Econ 9505A - Econometrics I	Recommended Elective: Econ 9xxx Applied Financial Econometrics

Term I -- Fall	Term II -- Winter	Term III -- Fall
Actuarial Science 9022A - Introduction to Financial Markets and Quantitative Finance with Excel	Recommended Elective: Statistical Science 9521B. Financial Modelling II	Recommended Elective: Applied Mathematics/Act. Science course Or Econ 9xxx Financial Economic History
		Econ 9599: Senior Seminar

Recommended Course Sequence B

Term I -- Fall	Term II -- Winter	Term III -- Fall
Econ 9501A -Micro 1	Econ 9536 Fin Econ 1	Business 811 Empirical Methods in Financial Economics Or 821 Corporate Finance
Econ 9503A- Macro 1	Business 811 Empirical Methods in Financial Economics Or 821 Corporate Finance	Law 5560 - Securities Regulation
Recommended Elective: Econ 9xxx Financial Economic History	Econ 9505A - Econometrics I	Applied Math 9578: Financial Options
Actuarial Science 9022a/b - Introduction to Financial Markets and Quantitative Finance with Excel	Recommended Elective: Eco 9xxx Financial Intermediation and Regulation	Recommended Elective: Econ 9xxx Applied Financial Econometrics
		Econ 9599: Senior Seminar

Summer Internship

During the summer term, which lasts from the beginning of May to the end of August, students are strongly encouraged to either (i) find and engage in a summer internship, or (ii) to participate in a research project (i.e. work as a Research Assistant) with a faculty member. While there is no guarantee that a student will secure a summer internship, the MFE Director shall make every effort to ensure that individuals are placed in internships for the summer. All research projects will require the prior approval of the MFE Director. Students are expected to actively look for work and to regularly liaise with the MFE Coordinator about the status of their search for an internship. However, since the summer internship is not a formal requirement for completion of the degree, a student who does not complete a summer internship will be eligible to graduate from the program upon successful completion of the degree requirements.

Workshops, for purposes of resume and cover-letter writing as well as interview skills and job-search techniques will be offered during the year in order to facilitate student's summer job search. Information Sessions are offered throughout the year by various potential recruiters of MFE students.

Progression Requirements

To graduate from the program, a student must have an overall average of at least 75 % in courses taken in the program, with no grade below 60 %. In addition, students must maintain an overall average of at least 70 % each semester in order to continue in good standing in the program.

Part-time Studies

The program will not be offered on a part-time basis.

All Graduate Courses Offered in the Program