

# REPORT OF THE ACADEMIC STANDARDS COMMITTEE

## Report #W2012–3; April 2012

In this report the Academic Standards Committee (ASC) brings to Senate its evaluation and recommendation on a number of items.

- the name change of the *Bachelor of Arts in Early Childhood Education* program to the *Bachelor of Arts in Early Childhood Studies* program
- the *Certificate in Financial Mathematics Modeling* from the Chang School
- the *Optional Specialization in Digital Entrepreneurship and Innovation*
- the *Bachelor of Science* program in *Financial Mathematics* from the Faculty of Engineering, Architecture and Science (Program to be offered by the new Faculty of Science)

### **A. NAME CHANGE OF THE BACHELOR OF ARTS IN EARLY CHILDHOOD EDUCATION TO BACHELOR OF ARTS IN EARLY CHILDHOOD STUDIES**

At its January 24, 2012 meeting, Senate approved to change the name of the School of Early Childhood Education to the School of Early Childhood Studies. This change will come into effect in Fall 2012.

As a complement to the change to the School's name, the School is proposing to change the designation of both the four-year degree and two-year degree completion program from Bachelor of Arts in Early Childhood Education to Bachelor of Arts in Early Childhood Studies. The name changes of the School and of the program reflect evolution in the School as a result of the periodic program review of the Bachelor of Arts in Early Childhood Education (approved by Senate, November 2010).

There are three key reasons for the proposed name change: the revised name better reflects the breadth and depth of knowledge and skills expected of students over the course of the program; the change recognizes that students enter the program with the intention of working with young children in a wide range of careers in education, community services and health; the change distinguishes the School's program from two-year diplomas in ECE offered by the community colleges.

The first intake of students to the program with the revised degree designation is the Fall 2013 cohort. Marketing of the program under its new name will begin in the Fall 2012 recruitment cycle.

The University Planning Office has confirmed that the name change will create no negative financial issues for the University.

## Recommendation

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed change to the name of the Bachelor of Arts in Early Childhood Education program to Bachelor of Arts in Early Childhood Studies.*

## B. PROPOSAL FOR A CHANG SCHOOL CERTIFICATE IN FINANCIAL MATHEMATICS MODELING

**1. The Proposal:** The Department of Mathematics at Ryerson University in cooperation with The G. Raymond Chang School of Continuing Education proposes to offer a Certificate in Financial Mathematics Modeling. The Department of Mathematics is also preparing to propose an undergraduate program in Financial Mathematics (see below). This certificate program's three required courses will be developed and offered in the undergraduate degree program as well as in The Chang School's Financial Mathematics Modeling Certificate.

**2. Certificate Goals:** Given the sophistication of mathematical methods used across the private sector, the time is ripe for a certificate program in Financial Mathematics Modeling at Ryerson. The location of Ryerson, in the heart of the Banking and Investment sector in downtown Toronto, provides ample career opportunities, at entry, mid- and senior levels, to graduates of the certificate.

Expertise in Financial Mathematics already exists in the Department of Mathematics. The presence of an existing world-class research group in Financial Mathematics within the department ensures that the proposed certificate program is built upon a solid academic foundation within the department which is the Academic Home for the certificate.

Ryerson has set goals for phased-in growth of innovative programs that provide cross-disciplinary learning, are professionally relevant, and have an integrated approach to academic and hands-on knowledge. All of these goals are addressed by this proposed certificate program.

**3. Target Group/Audience:** A certificate program in Financial Mathematics Modeling is an excellent complement to other skills adult professionals may already possess and will be of interest to those who have a background in Economics, Math, Science, Engineering or Finance and who seek career advancement, career portability and career longevity. The certificate will attract: employees of financial institutions in general, Risk Managers, Fund Managers, Traders, Financial Controllers, Accounting and Actuarial Personnel and Central Bankers.

**4. Certificate Structure & Learning Outcomes:** The Certificate in Financial Mathematics will consist of six 39-hour courses in total. Three (3) courses are required. Participants are required to select an additional three (3) elective courses based on their background and interests. All courses are will be offered in-class through The Chang School.

## 5. Curriculum:

*Required Courses:* The required course<sup>1</sup>s are: CMTHAAA: Computational Methods in Mathematics and Statistics; CMTHBBB: Financial Mathematics I; CMTHCCC: Financial Mathematics II.

*Elective courses:* These are: CMTH500<sup>2</sup>: Introduction to Stochastic Calculus; CMTH304: Probability and Statistics I; CKCS120<sup>3</sup>: Structured Programming in C; CFIN300: Managerial Finance I; CFIN501: Investment Analysis I.

**6. Development Plan:** Near-term development includes the authorship of the three new required courses. All other courses in the certificate already exist.

**7. Societal Need:** The proposed certificate program directly addresses the societal need, in Canada and globally, for highly trained quantitative analysts in the financial sector. It is expected that the growing demand by employers for expertise in Financial Mathematics and Financial Mathematics Modeling in many sectors of the economy will be answered in some measure by the offer of this certificate.

**8. Admissions:** The admissions requirements for this certificate program are mature student status and evidence of university-level coursework in Mathematics, Economics and/or Finance; or equivalent (Equivalency to be determined by the Academic Coordinator). Additionally, an applicant with mature student status and other relevant qualifications or relevant industry experience may be considered by the Academic Coordinator for entry to the Certificate.

An Applicant Assessment with the Academic Coordinator is required to register in the Certificate program. During the Applicant Assessment the Academic Coordinator will chart the applicant's plan of study based on the strength of his or her professional background, coursework; or equivalent. Prerequisites to courses comprising the certificate program may be waived as a result of an applicant's having been assessed by the Academic Coordinator to have the strength of background necessary to be approved and to be registered in the certificate program.

A student admitted to the certificate program must complete satisfactorily the certificate's six (6) courses in order to be eligible to receive the Certificate in Financial Mathematics Modeling.

**9. Academic Governance:** The certificate will reside in the Department of Mathematics in the Faculty of Engineering and Architectural Science (FEAS) until the formation of the Faculty of Science where it will be transferred. The normal procedures and prescriptions mandated by Policy #76 will apply to the academic and administrative oversight of this certificate offering.

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<sup>1</sup> All required courses are new and will be required as part of this certificate and of the proposed BSc in Financial Mathematics (see below).

<sup>2</sup> This is a new course that will be developed within the proposed undergraduate program in Financial Mathematics, see below.

<sup>3</sup> This course exists at the Chang School.

## Recommendation

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Certificate in Financial Mathematics Modeling.*

## C. PROPOSAL FOR AN OPTIONAL SPECIALIZATION IN DIGITAL ENTREPRENEURSHIP AND INNOVATION

**1. Background and Rationale:** Innovation in the digital economy is rapidly and profoundly altering our society at the local, national and global levels. Digital media is having (and will continue to have) profound influences upon learning and research. University graduates, regardless of their field of study, will be confronted with demands that reflect these rapid changes as they enter the work force, pursue advanced study or research careers. The increasingly pervasive role of digital media in society also provides exceptional scope for motivated students to identify new opportunities and to create and develop their own ideas to meet these opportunities. Students from any discipline may have concepts they wish to develop as the influence of digital media infuses fields as diverse as the humanities, health care and the STEM subjects. As an educational community, Ryerson therefore faces the challenge of how best to take advantage of these changes and to support our students in new ways of learning. The proposed *Optional Specialization in Digital Entrepreneurship and Innovation* is a response to this challenge.

Ryerson is uniquely positioned to offer such a program as it has core strengths in applied technology, interdisciplinary research, and industry partnerships. We are committed, by a long-standing mandate, to help our students take the lead in emerging job and innovation sectors. Further, Ryerson has two important and unique strengths that would support an innovative EL curriculum such as the Specialization Semester: five, soon to be six, strong Faculties ready to collaborate on the initiative (Arts, FCAD, FCS, FEAS, Science and TRSM), and our institutional experience with the Digital Media Zone.

The proposed *Optional Specialization in Digital Entrepreneurship and Innovation* is in some ways a reimagining of what experiential learning might be. It responds to a commitment made in our current academic plan for Ryerson to be “innovative in identifying experiential learning opportunities”. It also aligns closely with Ryerson’s goal to be a leader in career-relevant education and in education that fosters innovation and entrepreneurial thinking in the digital global society.

**2. The Curriculum:** Full details of the curriculum, including week-by-week course content and objectives, can be found in the full proposal. In synopsis: The *Optional Specialization in Digital Entrepreneurship and Innovation* is composed of two elements: (i) a 12-week course related to *Digital Skills and the Global Economy* (DElxxx), which will run every Fall and Winter semester, and (ii) a 12-week *Experiential Semester in Digital Entrepreneurship and Innovation* (DElxyy) which will run in the Spring/Summer.

The *Digital Skills* course will provide students with skills and insights allowing them to explore and understand appropriate use of digital technologies, and to critically review the role of technology and media in career development and in the broader society. The *Digital Skills* course is intended to be available to any undergraduate student at Ryerson as a for-credit elective which can be used towards degree-completion. It is also pre-requisite to the *Experiential Semester*.

The *Experiential Semester* will provide students with the skills to work together as members of high-performance teams, successfully develop innovative products or services, launch these products/services in the market (either internally or externally) or spin-off their technology into independent start-ups more rapidly and effectively. These outcomes will be achieved through a one-week intensive “bootcamp” in the first week of the *Experiential Semester* followed by a 12-week team-based, immersive project experience moderated by expert mentors. The *Experiential Semester* is external to degree programming; it will be an optional “add-on” to a student’s undergraduate education. Students who successfully complete the combination of the *Digital Skills* course and the *Experiential Semester* will be awarded the credential *Optional Specialization in Digital Entrepreneurship and Innovation*.

**3. Precedent:** It should be pointed out that FEAS already offers a 6-credit Optional Specialization in Management Sciences. The Senate approved offering as been in place since 2003.

**4. Career Pathways:** The *Optional Specialization*, in combination with a Ryerson undergraduate degree, can potentially provide a route to productive careers in a broad industrial sector. Students may aspire to take up technical roles in the gaming industry, not-for-profit sector, education, entertainment, health care, community organizations, fields related to the STEM disciplines and other areas. The training in entrepreneurial approach and teamwork provided by the Specialization Semester may encourage some students to make a serious commitment to develop and launch their own ideas. Thus potential career paths may be as employees of firms/organizations in the sector or as independent entrepreneurs. In addition, the combination of the Optional Specialization with a Ryerson undergraduate degree may strengthen a student’s application for admission to digital media or business and entrepreneurship-related graduate studies.

**5. Admission Requirements:** Admission to the *Digital Skills* course (DElxxx) is based on enrolment in a Ryerson undergraduate program with CLEAR academic standing in that program. Admission to the summer *Experiential Semester* (DElxyy) will require successful completion of DElxxx with a minimum grade in the B-range, or better while maintaining CLEAR standing in the student’s undergraduate degree program. Admission to the *Experiential Semester* will be restricted to students who have completed the first year or higher of their undergraduate degree program.

**6. Enrollment Targets and Launch Date:** It is anticipated that about 145 students will be enrolled in the *Experiential Semester* at steady-state. Full implementation of the program is slated for Fall 2012. A pilot of the *Experiential Semester* will launch in the Spring/Summer 2012 with a cohort of between 30 and 40.

## **7. Resources:**

*Staffing* - A commitment of faculty workload on the order of 0.25 FTE RFA. An Optional Specialization Project Director (RFA). A Program Coordinator and program assistant. A technical support person. Mentors/Project Managers - 1.6 FTE at steady-state (0.67 FTE in pilot phase).

*Space* - A dedicated classroom, access to a bookable computer lab. Such space is readily available during the summer months, particularly in FCAD. The Dean of FCAD has indicated a willingness to negotiate space and equipment use related to the Optional Specialization. Access to Zone space may be provided on occasion.

*Software/Hardware* - Most items are covered by site licenses (e.g., Office, Photoshop) but may need to provide access to animation software as well as Digital production tools and editing software (FCAD). Students are expected to provide their own laptops.

**8. Academic Governance:** The Optional Specialization will have its academic home in the Office of a Dean of Record. The Dean of Record in the first instance will be the Dean of the Faculty of Communication and Design. It is anticipated that each Faculty Dean will take responsibility for the program on a three-year rotation. This feature is important as the program is not meant to be the purview of a single Faculty, but open to students from all Faculties. The rotation of the Dean of Record will reinforce this characteristic of the program. The Dean of Record, or designate, will have responsibility for teaching assignments as negotiated with individual faculty and their Chairs/Directors and Deans. It is anticipated that much of the instructional weight will be carried by industry-sector experts engaged as CUPE instructors.

Upon implementation, an *Optional Specialization* committee will be struck. A probable composition for the committee is one Associate Dean from each of the six Faculties, the Chair (or designate) of the Department of Entrepreneurship and Strategy, the Optional Specialization Program Coordinator and the Director of the Digital Media Zone (or designate), supported by the Optional Specialization program assistant. The program committee will have responsibility for academic and admission decisions.

**9. ASC Evaluation:** As Ryerson continues to lead curricular innovation, new ideas continue to be brought forth to ASC. These new ideas are often part of proposals that include details that are to some extent "works in progress" due to their experimental and innovative nature. As a result these proposals may have aspects or elements that include pilot projects, some details of which are "to be determined" or a proposed implementation that will be understood to evolve as events progress.

The proposal for the *Optional Specialization in Digital Entrepreneurship and Innovation* is one such proposal. The proposal is well developed and thoroughly considered but it also includes a pilot implementation phase and some new governance considerations for this program (Although it should be noted that the concept of "Dean of Record" is embedded in Ryerson policies for interdisciplinary curricula). These proposal elements are somewhat different from typical proposals presented to ASC.

When considering this exceptional proposal, ASC recognizes the emergent nature of some elements of the program's implementation. ASC also considered the program's myriad strengths including: its cross-faculty positioning; unanimous support for the program from the Deans of all five of Ryerson's current undergraduate faculties as well as by the Dean of the Yeates School of Graduate Studies; its strong alignment with the 2008-13 Academic Plan's emphasis on Digital Media, Communication, and Information Technology; its alignment with the new curriculum framework, and the intensive experiential learning opportunities offered. It is on the basis of these strengths that ASC recommends Senate approval of the proposal.

In recommending this initiative to Senate, ASC is confident that those responsible for introducing and managing the program will continue to work closely with university planning, the Office of the Vice-Provost Academic, the Registrar's office, and other campus partners to develop a program that serves Ryerson and its students, and which, while distinctive, reflects and advances Ryerson values and priorities.

### **Recommendation**

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Optional Specialization in Digital Entrepreneurship and Innovation.*

## **D. PROPOSAL FOR A BACHELOR OF SCIENCE DEGREE PROGRAM IN FINANCIAL MATHEMATICS**

**1. Overview:** The Department of Mathematics at Ryerson University proposes to offer a new undergraduate specialization culminating in a B.Sc. degree: the *Bachelor of Science in Financial Mathematics*. The program will be offered by the Department of Mathematics under the umbrella of the new Faculty of Science, with the support of the TRSAF (Ted Rogers School of Accounting & Finance) Finance Department. The B.Sc. in Financial Mathematics (FM) will leverage the combined talents of the Mathematics and Finance Departments with contributions from the Accounting Department and the School of Professional Communications (FCAD). The Department's current B.Sc. in *Mathematics and its Applications*<sup>4</sup> (MIA) dovetails naturally with the proposed program. The anticipated program launch is Fall 2013.

**2. Societal Need and Career Paths:** Given the ubiquity of finance in our society and the sophistication of mathematical methods used in the financial industry, the time is ripe for a program in FM at Ryerson. FM has tremendous relevance in our society. It is a natural tool for dealing with large, complex financial operations accompanied by risk and unpredictable results; FM models offer systematic tools to help understand the repercussions of the movement of capital. It can also be argued that FM applications are rooted in the basic connections between specific mathematical constructions and the fundamental economic hypotheses used to understand financial markets. FM is an area of applied mathematics with

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<sup>4</sup> The existing MIA program offers a stream in Finance, which will be phased out as soon as the new program begins. No new students will be allowed to take it, starting the first year of the FM program. Those students who are already taking the stream will simply continue to do so with no changes.

a solid and long-term role in Finance. A program in Financial Mathematics is a unique chance for the University to leverage opportunities presented by a newly established discipline, and to position itself at the forefront of undergraduate education in this burgeoning field.

The specific field of FM has seen enormous growth over the past decade, and become a recognized discipline in its own right. The demand for people with specialized FM knowledge is growing steadily, and as such, the time has never been better to introduce a larger program that will train employees and leaders in an exciting, evolving field.

Following the financial crisis in 2008-2009, banks and other institutions have developed a renewed interest in hiring highly qualified personnel with quantitative backgrounds. It is reasonable to expect that this trend will continue in the coming years. Therefore, the B.Sc. in Financial Mathematics will put graduating students in a notably advantageous position in the financial job market or in the pursuit of further studies.

The program will prepare students for a wide variety of financial roles, including but not limited to: computational finance, financial engineering, investment banking, risk management software, trading system development, securities trading and financial risk management, derivatives trading and risk management, collateralized debt obligation, credit default swaps.

Graduates of the FM program will thus have excellent employment opportunities, as well as to the ability to continue with graduate studies; their knowledge and skills will be an excellent fit with Ryerson's M.Sc. in *Applied Mathematics*.

Although there are no specific licensing or accreditation requirements in the field of Financial Mathematics, the program prepares students for two major professional certification programs offered in risk management: the Professional Risk Manager exam, organized by the Professional Risk Managers' International Association (PRMIA), and the Finance Risk Manager exam offered by the Global Association of Risk Professionals (GARP). The proposed course MTHCCC offers training sessions for both certification programs in lectures (weeks 11 and 12) and labs. In addition, the textbook proposed for MTHCCC is the book used to prepare for the exam in Financial Risk Manager Certification.

**3. Comparator Programs:** There is currently only one other FM program in Canada, located at Wilfred Laurier University. Given that Ryerson is situated in Toronto, which is the center of the country's financial industry, we have the advantage of a strategic location. Further, the Laurier program concentrates solely on mathematics with no finance courses offered in the curriculum.

**4. Resources:** The Department of Mathematics consists of 18 regular faculty members, one limited-term faculty member, an administrative assistant, a departmental assistant and an IT technician. One regular faculty member acts as the Associate Chair in charge of undergraduate programs. The Department currently has 103 students enrolled in the MIA program.

One new tenure-track faculty member will be required by the start of the third year of the program's commencement.

**5. Admission Requirements:** O.S.S.D. with six Grade 12 U/M courses, including Grade 12 U courses in: English, Advanced Functions (MHF4U), one of Calculus and Vectors (MCV4U) or Mathematics of Data Management (MDM4U), and one of Biology (SBI4U) or Chemistry (SCH4U) or Physics (SPH4U).

NOTES:

1. ENG4U/EAE4U is the preferred English.
2. The grade(s) required in the subject prerequisites (normally in the 65-70 percent range) will be determined subject to competition.
3. Students are encouraged to include Grade 12 U Physics (SPH4U) in their secondary school studies.

Subject to competition, candidates may be required to present averages/grades above the minimum.

Note that these are identical to the admission requirements for the BSc in Mathematics and its Applications.

**6. Curriculum:** The FM program is made up of 27 required courses, including one required orientation course (SCI180), six liberal arts courses and eight electives, for a total of 41 courses. Of the required courses, 14 are from Mathematics, six are from Finance, one is from Computer Science, one is from Professional Communications, one is from Economics, one is from Accounting and three are first-year science courses (including SCI1801). It should be noted that the proposed curriculum is consistent with the curriculum framework approved by Senate in June, 2011.

A semi-common first year gives science students the chance to change programs within the science platform with an acceptable transferability of credits. At the same time, expanded Mathematics programming allows non-program students a better opportunity to obtain a Mathematics minor or to upgrade their mathematical skills.

Three new mathematics courses have been developed for the program. MTHAAA *Computational Methods in Mathematics and Statistics* is a methods course for FM students that can also serve as an elective course for MIA students, or any Ryerson students with the appropriate prerequisites. MTH BBB/CCC *Mathematical Finance I and II* are capstone courses that integrate everything students have learned into a coherent whole.

MIA students also take a number of professionally related Mathematics electives, which are also available to Science and Computer Science students. Recently, Engineering, Finance and Economics students have shown an increased interest in taking Mathematics electives in the pursuit of a minor or to prepare for graduate school. The proposed FM program will increase the number and frequency of Mathematics electives being offered to all students at Ryerson.

The program curriculum is made up of three parts:

Part 1, which takes place in the first two years, students will take courses in calculus, linear algebra, and probability and statistics, which will prepare them for the specialized content offered later in the program.

Part 2 will include probability and stochastic processes, ordinary and partial differential equations and numerical analysis. In parallel, students will take a series of courses with a financial perspective in all phases of the program.

The core elements of the program takes place in Part 3, with a series of courses with specific content in Financial Mathematics including Computational Methods in Mathematics and Statistics (MTH AAA), Financial Mathematics I (MTH BBB) and Financial Mathematics II (MTH CCC).

The following table summarizes the program:

Table 1: First Year Financial Mathematics	
SEMESTER 1	SEMESTER 2
MTH 131 Modern Mathematics I	MTH 231 Modern Mathematics II
ACC 110 Financial Accounting	FIN 300 Managerial Finance I
PCS 120 or BLG 143 or CHY 103	PCS 130 or BLG 144 or CHY 113
ECN 104 Introductory Microeconomics	CMN 279 Intro. Business Comm.
CPS 118 Intro. Programming	Liberal Studies: Table A
SCI 180 Orientation	
Table 2: Second Year Financial Mathematics	
SEMESTER 3	SEMESTER 4
MTH 330 Calculus & Geometry	MTH 430 Dynamical Systems & Diff. Eqs.
MTH 304 Probability & Statistics I	MTH 404 Probability & Statistics II
MTH 3XX Modern Mathematics III	FIN 501 Investment Analysis I
FIN 401 Managerial Finance II	Elective
Elective	Liberal Studies: Table A
Table 3: Third Year Financial Mathematics	
SEMESTER 5	SEMESTER 6
MTH 500 Intro. Stochastic Calc.	MTH AAA Computational Methods
MTH 501 Numerical Analysis	MTH 712 Differential Equations II
Elective	Elective
Elective	Elective
Liberal Studies: Table A	Liberal Studies: Table B
Table 4: Fourth Year Financial Mathematics	
SEMESTER 7	SEMESTER 8
MTH BBB Financial Mathematics I	MTH CCC Financial Mathematics II
FIN 601 Investment Analysis II	MTH 719 Applied Linear Algebra
FIN 800 Ethics in Finance	FIN 801 Financial Risk Management
Elective	Elective
Liberal Studies: Table B	Liberal Studies: Table B

**7. Experiential Learning:** The proposed program will nurture effective and long-term collaboration with the financial industry and provide graduates with valuable practical skills in the following ways:

- Access to co-op placements for hands-on learning
- Opportunities for undergraduate research relevant to the financial industry
- Several courses, especially capstone courses MTH BBB and MTH CCC, include experiential learning content that allows students to learn industry techniques such as portfolio management investment and risk analysis
- Case studies prepare students for real-world problems arising in the financial industry

**8. Undergraduate Degree Level Expectations:** By the end of this program students will meet the following goals:

1. Proficiency<sup>5</sup> in elementary areas of mathematics (such as calculus and linear algebra) and specialized knowledge in areas relevant to financial mathematics (such as stochastic processes, differential equations, and numerical analysis).
2. Demonstrate knowledge of the application of mathematics to finance, including risk management, portfolio management, and pricing financial derivatives.
3. Implement and innovate financial models, emphasizing validation and recognition of their limitations, including issues of corporate and social responsibility.
4. Effectively demonstrate analytical reasoning and problem solving skills in both written and oral formats.
5. Work effectively and confidently in teams.
6. Demonstrate proficiency in programming to solve problems in financial mathematics.

All required courses were mapped to program goals (see pg. 17 of proposal). Program goals were also mapped to UDLES (see pg. 18 of proposal)

**9. Report of the Peer Review Team and Responses:**

The Peer Review Team<sup>6</sup> visited Ryerson on February 13, 2012. During the visit, they met the chair, faculty members, staff and students of the department. The team was impressed by the quality of the proposal and the innovative nature of the proposed degree. They felt the program was timely and that the financial mathematics program would produce graduates that would satisfy societal demand.

*Recommendations of the Peer Review Team:*

1. An introductory microeconomics course must be added as a mandatory course.
2. The PRT recommended that faculty members that will teach MTH BBB and MTH CCC to coordinate with the finance department faculty that teach FIN 601 and FIN 801 so that they will not cover the same subjects twice and cover the material in a consistent manner.
3. To serve the program students and advise them properly, we believe a faculty Member has to be assigned to this task, especially in the early stages when the program, though small, is getting off the ground. Initially the program will accept 25 students, but later registration may increase, making the oversight by a faculty member important even in steady state. This member should either get some additional financial numeration or some course release.

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<sup>5</sup> Note that in the context of describing program goals, the term “Proficiency” is used as a generic descriptor to position the highest level of achievement for a goal relative an “Introductory” or “Reinforce” level of achievement.

<sup>6</sup> The team consisted of Dr. Matt Davison (University of Western Ontario), Dr. Eric Mendelsohn (University of Toronto) and Dr. Ayşe Yüce (Ryerson University).

*Response from the Dean:*

Dr. Darrick Heyd, Associate Dean, Undergraduate Science Programs and Student Affairs wrote the response on behalf of Dean Mohamed Lachemi. He was “very pleased with the team’s positive comments and strong endorsement of the program. The Department has worked very hard to produce an offering that is both innovative and rigorous, and that fits very well with Ryerson’s mission and goals.”

Regarding adding an introductory microeconomics course ECN 104 to the curriculum, it was felt that this was reasonable, considering the subject matter and the students’ expected placements in the financial sector. The ECN 104 course could easily accommodate another 25 students. This has been implemented in the revised curriculum described above.

The recommendation that the teaching of MTH BBB and FIN 601 be co-ordinated, also that the teaching of MTH CCC and FIN 801 be co-ordinated, was considered to be an excellent suggestion given the related material in the two pairs of courses. The difficulty is in formalising the arrangement so that it may be achieved with minimal reliance on institutional memory. Suggestions from Dr. Heyd included:

- The Departments of Mathematics and of Finance might explore (with the Registrar’s Office and Scheduling) the feasibility of integrating the two courses.
- Wording the Calendar course descriptions in a way that links the two courses may also be helpful.
- Mentioning the linkage in the Program Overview may keep the idea from being lost.
- Maintaining awareness among the instructors, as teaching assignments change from year to year, is the challenge.
- Another key component to implementing this recommendation is oversight. The program director will likely have an ongoing oversight and liaison role in this aspect of the program.

The third recommendation of the Peer Review Team was to assign a faculty member the task to serve the program students and advise them properly. Dr. Heyd responded that this program, while interdisciplinary, has its academic home in the Department of Mathematics and the FM students will be affiliated with that department. The program is a modification of an existing branch of Mathematics and Its Applications (i.e., the Finance stream), which branch will be discontinued after the new program starts. It is unlikely that Financial Mathematics, at its inception at least, will generate enrolments large enough to require its own program director; however, as the program grows, a new program directorship may be necessary. Dr. Heyd recommends that the Department hold off on creating a new program office until there is a demonstrated need and the increased revenue to support the position.

*Response from Department of Mathematics:*

As noted above, the proposal has been modified to include ECN 104 *Introductory Microeconomics*. This has been added to the third semester in place of an elective.

The Department understands that the coordination between the two Finance courses and the two Financial Mathematics courses in semesters seven and eight can only make the curriculum stronger. As the process of making this proposal has unfolded, the two departments have experienced a growing connection and a good working relationship. By 2016, which is the earliest that this coordination will take place, the Department is confident that it will have worked out a strategy for coordination. Presently the responsibility to see that this happens will rest with the Associate Chair, Undergraduate. The Associate Dean has made some excellent suggestions and the department will consider them.

Regarding recommendation #3 the department agrees with the recommendations of the Associate Dean. There are larger programs at the University that only have one Associate Chair, and the department thinks that the levels of support needed to administer the new program as asked for in the proposal below are sufficient. This does not mean, however, that as the program grows the department will not consider seeking new resources.

**10. ASC Evaluation:** The ASC was impressed with the solid design of the program and the strong, collaborative relationship which has grown between the Department of Mathematics and the Department of Finance. It agrees with the positive opinions expressed by the Peer Review Team.

The ASC recognizes the concern raised in the Dean's response about ensuring coordination amongst the pairs of courses MTH BBB and FIN 601 and MTH CCC and FIN 801 and agrees that one or more of the coordination strategies be implemented once these courses start to run.

The ASC notes that Program Goal 5, Working Effectively and Confidently in Teams, is supported by five courses, four of which occur in Y4 of the program. ASC recommends that the program monitor the effectiveness of this and consider the possibility of incorporating team-focused activities at an earlier point in the program. On a related notes, Program Goals 4, 5 and 6 lack support at the Reinforce and Proficiency levels. Again, the program should monitor the effectiveness of these courses to deliver on learning outcomes and make adjustments over time if needed.

## Recommendation

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Bachelor of Science degree program in Financial Mathematics.*

Respectfully Submitted,



Chris Evans, Chair for the Committee

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### ASC Members:

Keith Alnwick, Registrar

Ian Baitz, Faculty of Communication and Design, Graphic Communications Management

Jennifer Cartwright, Ted Rogers School of Management, Business Management, Student ASC Member

Naomi Eichenlaub, Librarian, Library

Chris Evans, Vice-Chair and Vice Provost Academic

Jacob Friedman, Faculty of Engineering, Architecture, and Science, Mechanical and Industrial Engineering

Noel George, Faculty of Engineering, Architecture, and Science, Chemistry and Biology

Jacqui Gingras, Faculty of Community Services, Nutrition

Des Glynn, Chang School of Continuing Education

Andrew Hunter, Faculty of Arts, Philosophy

Suanne Kelman, Faculty of Communication and Design, Journalism

Tim McLaren, Ted Rogers School of Management, Information Technology Management

Pamela Robinson, Faculty of Community Services, Urban and Regional Planning

Diane Schulman, Secretary of Senate, Non-voting ASC Member

John Turtle, Faculty of Arts, Psychology

Andrew West, Faculty of Arts, Politics, Student ASC Member