

REPORT OF ACADEMIC STANDARDS COMMITTEE

Report #W2019-4; May 2019

In this report the Academic Standards Committee (ASC) brings to Senate its evaluation and recommendation on the following items:

- CHANG SCHOOL OF CONTINUING EDUCATION – Discontinuation of the Certificate in Environmental Sciences
- CHANG SCHOOL OF CONTINUING EDUCATION – Revision of graduation requirements for the Certificate in Economics and Finance
- CHANG SCHOOL OF CONTINUING EDUCATION – Discontinuation of the Certificate in Economics
- CHANG SCHOOL OF CONTINUING EDUCATION – New Certificates in Economics – Level 1 and Economics – Level 2
- CHANG SCHOOL OF CONTINUING EDUCATION – Discontinuation of the Certificate in Energy Management and Innovation
- CHANG SCHOOL OF CONTINUING EDUCATION – New Certificate in Energy Management and Conservation
- CHANG SCHOOL OF CONTINUING EDUCATION – Discontinuation of the Certificate in Financial Mathematics Modeling
- CHANG SCHOOL OF CONTINUING EDUCATION – New Certificate in Financial Mathematics Modeling and Predictive Analytics
- FACULTY OF ENGINEERING AND ARCHITECTURAL SCIENCE – Course Grading Variations
- DEPARTMENT OF PHYSICS – Course Grading Variations
- *For Information:* Chang School Certificates – Revisions (March 2019)

A. CHANG SCHOOL OF CONTINUING EDUCATION – Discontinuation of the Certificate in Environmental Sciences.

On January 29, 2019, the Curriculum Committee and Program Advisory Council for the Certificate in Environmental Sciences approved its discontinuation, effective Fall 2019. This certificate, housed within the Department of Chemistry and Biology, has been delivered for over twenty years through The Chang School's Engineering, Architecture & Science unit. There have been 77 graduates from 2009 to 2017, and enrollments in the last five years have decreased. Currently, 42 students are enrolled in the certificate, with 29 total enrolments in FY2018-19.

A communication will be sent to the 42 students advising them of the discontinuation. The communication will include a proposed schedule for the 2019/2020 academic year with 2 (two) courses offered each term so that students wishing to complete the program can make plans to do so. Accommodations, if required, shall be made to facilitate completion of certificate graduation requirements, including course substitutions and course directives. The earliest likely timeframe for discontinuation is the end of the 2020/2021 academic year.

Five of the CKES course are also electives in other certificates and are part of a Course Series in Environmental Sciences offered through The Chang School. There are no immediate plans to discontinue the courses. The status of certificate completions will be reviewed prior to making any recommendations to discontinue these courses.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the discontinuation of the Chang School Certificate in Environmental Sciences.*

B. CHANG SCHOOL OF CONTINUING EDUCATION - Revision of graduation requirements for the Certificate in Economics and Finance

In November 2018 the Department Council for the Department of Economics voted in favour of revising the current, eight-course Certificate in Economics and Finance, housed in the Department of Economics, to a more condensed, six-course certificate, effective Fall 2019. The Department Council for Finance voted in favour of this proposed change on March 4, 2019.

The Certificate in Economics and Finance is comprised of eight, degree-credit courses: six required (CECN 104, CECN 204, CECN 506, CFIN 300, CFIN 401, and CFIN 501) and two electives. Designed for students who aspire to a career in banking and finance, as well as those who want to accelerate their careers, the certificate helps to develop strong analytical skills through a variety of foundational courses in both economics and finance. This certificate helps prepare students to qualify as a Chartered Financial Analyst (CFA) and/or Certified Financial Planner (CFP), or to pursue graduate studies in economics, finance, or business administration.

The Certificate in Economics and Finance has not attracted a large following. 67 students have registered in the certificate since its launch in 2011 and only twelve have graduated. Ten students have also discontinued or cancelled their registration.

An analysis of certificate student enrolment history suggests that eight courses is too long for such a certificate. In at least two cases, students completed seven courses, but discontinued before they completed the eighth and final course to graduate. More commonly, students had completed one to four courses and then discontinued. Another factor is that the finance courses require CACC 110 as a prerequisite, effectively making this a nine-course certificate for some students.

The Department of Economics and the School of Accounting and Finance believe that a shorter, six-course certificate may help increase student registration, retention, and graduation rates while still maintaining the academic goals and learning outcomes of the current eight-course certificate. Additionally, a shorter six-course certificate is similar in length to an undergraduate minor at Ryerson and is in keeping with current trends of shorter certificates in continuing education units across North America. It would be possible in the new six-course Economics and Finance certificate for students to complete the certificate in just three semesters, i.e., one academic year.

Proposed Curriculum Changes

The main changes will be to reduce the number of courses required for graduation from eight to six; and to move CECN 506: Money and Banking and CFIN 501: Investment Analysis from the required list of courses to the elective list of courses. The admission criteria and the minimum CPGA of 1.67 to graduate remain the same. A comparison between the current eight-course Certificate in Economics and Finance with the revised six-course Certificate in Economics and Finance follows:

Current Certificate (eight courses)	Revised Certificate (six courses)
Required Courses	Required Courses
CECN 104 Introductory Microeconomics	CECN 104 Introductory Microeconomics
CECN 204 Introductory Macroeconomics	CECN 204 Introductory Macroeconomics
CECN 506 Money and Banking	CFIN 300 Managerial Finance I
CFIN 300 Managerial Finance I	CFIN 401 Managerial Finance II

<p>CFIN 401 Managerial Finance II CFIN 501 Investment Analysis</p> <p>Electives (select two) Note: Students are allowed to choose only one of CECN 129 or CQMS 102 as their electives. Students are allowed to choose only one of CECN 721 or CFIN 621 as their electives.</p> <p>CECN 129 Statistics for Economics I CECN 301 Intermediate Macroeconomics I CECN 504 Intermediate Microeconomics I CECN 606 International Monetary Economics CECN 703 Public Sector Economics CECN 721 International Financial Markets CECN 803 Canadian Tax Policy CFIN 502 Personal Financial Planning CFIN 510 Small Business Finance CFIN 512 Risk Management and Insurance CFIN 601 Derivatives CFIN 612 Retirement and Estate Planning CFIN 621 International Finance CQMS102 Business Statistics I</p> <p>Admission Criteria It is recommended that applicants have the following: OSSD with six Grade 12 U, including Grade 12 U credits in English and Mathematics (one of which must be Advanced Functions, Calculus and Vectors, or Data Management), or M credits with a minimum grade of 70 percent; or equivalent; or mature student status. As well, student must have completed the following course or equivalent:</p> <p>CACC 110 Accounting: Financial Accounting</p> <p>Certificate Requirements The successful completion of eight courses, with a cumulative grade point average of 1.67 or higher, is required for the certificate.</p>	<p>Electives (select two) Note: Students are allowed to choose only one of CECN 129 or CQMS 102 as their electives. Students are allowed to choose only one of CECN 721 or CFIN 621 as their electives.</p> <p>CECN 129 Statistics for Economics I CECN 301 Intermediate Macroeconomics I CECN 504 Intermediate Microeconomics I CECN 506 Money and Banking CECN 606 International Monetary Economics CECN 703 Public Sector Economics CECN 721 International Financial Markets CECN 803 Canadian Tax Policy CFIN 501 Investment Analysis CFIN 502 Personal Financial Planning CFIN 510 Small Business Finance CFIN 512 Risk Management and Insurance CFIN 601 Derivatives CFIN 612 Retirement and Estate Planning CFIN 621 International Finance CQMS102 Business Statistics I</p> <p>Admission Criteria It is recommended that applicants have the following: OSSD with six Grade 12 U, including Grade 12 U credits in English and Mathematics (one of which must be Advanced Functions, Calculus and Vectors, or Data Management), or M credits with a minimum grade of 70 percent; or equivalent; or mature student status. As well, student must have completed the following course or equivalent:</p> <p>CACC 110 Accounting: Financial Accounting</p> <p>Certificate Requirements The successful completion of six courses, with a cumulative grade point average of 1.67 or higher, is required for the certificate.</p>
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Plan for Students in the Current Economics and Finance Certificate

The Registrar's policy on graduation states that a student must complete the curriculum requirements in effect as the time of registration in the certificate.¹ Therefore, students who register before July 1, 2019, will follow the

¹ <https://ce-online.ryerson.ca/ce/default.aspx?id=47>

curriculum of the eight-course Certificate in Economics and Finance. Students who register in the certificate after July 1, 2019 will follow the curriculum of the revised six-course Certificate in Economics and Finance.

There are currently 39 active students enrolled in the eight-course certificate. Each student will be contacted to let them know that the certificate is being discontinued as of June 30, 2019, but that the courses will continue to be offered, so that the students will be able to complete it. However, some students in the current eight-course certificate may wish to transfer into the revised six-course certificate. This option would only make sense for students who still have at least 50% of their coursework (i.e., 3 courses or more) to complete in the revised six-course certificate because students must complete 50% of their graduation requirements after they have registered in the certificate (as per Senate Policy #46: Undergraduate Grading, Promotion, and Academic Standing). In considering whether they should transfer, they should be aware that:

- All previous courses and grades will remain on their student record
- Any eligible courses that they have already taken will be used toward meeting their graduation requirements in the revised six-course certificate (e.g., if they have taken CECN 104 under the eight-course certificate, it will count toward graduation for the six-course certificate)
- Only courses taken after a student transfers to the six-course certificate will count toward the CGPA (e.g., if a student took CECN 104 in the eight-course certificate, the grade will not be part of CGPA for the six-course certificate)

The Academic Coordinator for Economics and the Program Director of Arts will advise current certificate students to help them determine whether transferring to the revised six-course certificate is a viable option.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the revision of graduation requirements for the Chang School Certificate in Economics and Finance.*

C. CHANG SCHOOL OF CONTINUING EDUCATION – Discontinuation of the Certificate in Economics

In November 2018 the Department Council for the Department of Economics voted in favour of discontinuing the current, six-course Certificate in Economics, effective Fall 2019. The certificate dates back to 2002 when it was originally eight courses long. In 2013, the Department analyzed student registration and graduation rates and came to the conclusion that the certificate's length and prescriptive requirements made it difficult and unattractive for CNEDs to complete. Therefore, in Fall 2014 the certificate was shortened and its curriculum was revised to better reflect the structure and length of the Ryerson undergraduate Minor in Economics, which shares many of the same courses. The current certificate curriculum comprises six, degree-credit economics courses: two required courses (CECN 104 and CECN 204) and four electives.

In the last five years (Fall 2014–Winter 2019) there has been a marked increase in certificate registrations (245 versus 114 from Fall 2009–Spring 2014), but unfortunately the cancellation rate has also increased (35% versus 26.3% from Fall 2009–Spring 2014) and the graduate rate has actually dropped (4% versus 9.6% from Fall 2009–Spring 2014). An analysis of enrolment patterns of certificate students who did not graduate indicates that the current curricular structure is still not meeting continuing education student needs. Many of these students either take introductory economics courses or they take intermediate and advanced courses before discontinuing their registration.

For this reason, the department proposes discontinuing the current six-course certificate and replacing it with two four-course certificates: Level 1, a foundational certificate in economics; and Level 2, a certificate with intermediate and advanced level courses. It is believed that these new four-course certificates will be better suited to continuing education student needs, and will distinguish them from the six-course Minor in Economics that is designed specifically for undergraduate students.

Currently, there are 253 students who are considered active in the certificate. Each student will be contacted to let them know that the certificate is being discontinued as of June 30, 2019, but that the courses will continue to be offered, so that the students will be able to complete it. Students interested in transferring to one of the newly proposed Economics certificates, either Level 1 or Level 2, will be assessed on a case-by-case basis, which will depend in part on their level and how many courses they have already completed.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the discontinuation of the Chang School Certificate in Economics*

D. CHANG SCHOOL OF CONTINUING EDUCATION – New Certificates in Economics - Level 1 and Economics - Level 2

The Department of Economics proposes replacing the current six-course certificate in Economics with two four-course certificates: 1) the Certificate in Economics: Level 1, a foundational certificate in economics; and 2) the Certificate in Economics: Level 2, a certificate with intermediate and more advanced level courses, effective Fall 2019. Because these two certificates are closely related, and the Certificate in Economics: Level 1 can ladder into the Certificate in Economics: Level 2, this proposal will cover both certificates together.

Certificate Goals

The goal of the Certificate in Economics: Level 1 is to provide students with an understanding of the principles of economics that will be useful not only for their careers, but also possibly for more advanced studies in economics or a related field. Students completing the certificate will be able to demonstrate knowledge of basic microeconomic and macroeconomic theory, and the application of such theory to various subfields of economics, including environmental economics, monetary economics, or international economics.

The goal of the Certificate in Economics: Level 2 is to provide students with a deeper understanding of economic theory and quantitative methods in order to prepare them for analytically-focused careers and/or graduate studies in economics or a related field. In particular, students completing the certificate will be proficient in applying mathematical and statistical tools to the analysis of a wide variety of economic and business problems.

Societal Need and Target Group

The Certificate in Economics: Level 1 is designed for students with limited or no background in economics who wish to acquire training that will be useful not only for their careers, but also possibly for more advanced studies in economics or a related field. This certificate provides students with an understanding of the principles of economics without requiring the mathematical preparation that would be required for some of the more advanced courses in the Certificate in Economics: Level 2. Students already working or aspiring to become employed in business, the government, the nonprofit sector, or the legal system will find this certificate gives them a new lens through which to view the issues they face.

The Certificate in Economics: Level 2 is designed for students who already possess a basic foundation in economics, such as the Certificate in Economics: Level 1, as well as a first course in calculus, such as CECN 189 (Introductory Mathematics for Economics). The courses for this certificate are more focused on economic theory and quantitative methods, which will prepare students for deeper analysis of a variety of topics, such as labor economics, environmental economics, or public sector economics. Students with a degree in another field may pursue this certificate as a stepping stone in pursuing graduate studies in economics or a related field. Please note that the completion of this certificate by itself does not satisfy the admission requirements for graduate school applications.

Certificate Structure

The Certificate in Economics: Level 1 consists of two required courses and two electives.

Required Courses

- CECN 104 Introductory Microeconomics
- CECN 204 Introductory Macroeconomics

Electives (select two)

- CECN 189 Introduction to Mathematics for Economics (Prerequisite: CECN109)
- CECN 220 Evolution of the Global Economy
- CECN 301 Intermediate Macroeconomics I (Prerequisites: (CECN101 or CECN104) and (CECN201 or CECN204))
- CECN 321 Introduction to Law and Economics (Prerequisite: ECN 101 or CECN 104 or Direct Entry)
- CECN 340 The Economics of Human Behaviour
- CECN 502 Economics of Energy and Natural Resources (Prerequisites: (ECN 101 or CECN 104) and (ECN 201 or CECN 204) or Direct Entry)
- CECN 504 Intermediate Microeconomics I (Prerequisites: (ECN 101 or CECN 104) and (ECN 201 or CECN 204) or Direct Entry)
- CECN 506 Money and Banking (Prerequisites: (ECN 101 or CECN 104) and (ECN 201 or CECN 204) or Direct Entry)
- CECN 511 Economy and the Environment
- CECN 512 The Economics of Sex (Prerequisite: ECN 101 or CECN 104 or CECN 110 or CECN 210 or Direct Entry)
- CECN 603 Canada and Global Economic Issues (Prerequisite: ECN 101 or CECN 104 or ECN 201 or CECN 204 or CECN 210 or Direct Entry)
- CECN 640 The Economics of Immigration (Prerequisites: (ECN 101 or CECN 104) and (ECN 201 or CECN 204) or Direct Entry)
- CECN 722 The Economics of Sports

The Certificate in Economics: Level 2 consists of four courses, one of which must be CECN 301 or CECN 504.

Elective courses (select four)

- CECN 230 Mathematics for Economics (Prerequisite: CECN 189 or CMTH 189 or ECN 89A/B or QMS 130 or CQMS 702)
- CECN 301 Intermediate Macroeconomics I (Prerequisites: (ECN 101 or CECN 104) and (ECN 201 or CECN 204) or Direct Entry)
- CECN 501 Industrial Organization (Prerequisite: CECN 504)
- CECN 504 Intermediate Microeconomics I (Prerequisites: (ECN 101 or CECN 104) and (ECN 201 or CECN 204) or Direct Entry)
- CECN 510 Environmental Economics (Prerequisite: ECN 101 or CECN 104 or Direct Entry)

CECN 600	Intermediate Macroeconomics II (Prerequisite: CECN 301)
CECN 601	The Economics of Information (Prerequisite: CECN 504)
CECN 605	Labour Economics (Prerequisites: (ECN 101 or CECN 104) and (ECN 201 or CECN 204) or Direct Entry)
CECN 606	International Monetary Economics (Prerequisite: CECN 301)
CECN 614	An Introduction to Game Theory (Prerequisite: CECN 504)
CECN 627	Econometrics I (Prerequisites: (CECN 230 or CMTH 310) and (CECN 329 or CQMS 442 or CMTH 404))
CECN 700	Intermediate Microeconomics II (Prerequisite: CECN 504)
CECN 702	Econometrics II (Prerequisite: CECN 627)
CECN 703	Public Sector Economics (Prerequisite: CECN 504)
CECN 707	Economics of International Trade (Prerequisite: CECN 504)
CECN 715	Advanced Microeconomics (Prerequisite: CECN 700)
CECN 803	Canadian Tax Policy (Prerequisite: CECN 504)
CECN 808	Economic Growth and Technological Change (Prerequisites: CECN 301 and CECN 504)
CECN 815	Advanced Macroeconomics (Prerequisites: CECN 230, CECN 504 and CECN 600)

Development Plan

All the courses offered in Level 1 and Level 2 have already been developed and are available for offer at The Chang School.

Admission Criteria

For the Certificate in Economics: Level 1, it is recommended that students have the following: OSSD with six Grade 12 U (including Grade 12 U credits in English and Mathematics) or M credits, or equivalent, or mature student status.

For the Certificate in Economics: Level 2, it is recommended that students have the following: OSSD with six Grade 12 U (including Grade 12 U credits in English and Mathematics) or M credits, or equivalent, or mature student status. Students are also required to have taken CECN 189 or its equivalent.

Academic Management and Governance

The Economics department will serve as the academic home for both the Certificate in Economics: Level 1 and the Certificate in Economics: Level 2. The Dean of Record will be the Dean of Arts. Administrative support will be the responsibility of The G. Raymond Chang School of Continuing Education. Routine matters, both academic and administrative, will be the responsibility of the Academic Coordinator.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the new Chang School Certificates in Economics – Level 1 and Economics – Level 2*

E. CHANG SCHOOL OF CONTINUING EDUCATION – Discontinuation of the Certificate in Energy Management and Innovation

The six-course Certificate in Energy Management and Innovation has been delivered since Fall 2013 through The Chang School's Engineering, Architecture & Science unit. The Academic Home, jointly shared by the FEAS Dean's Office, the Centre for Urban Energy and the Department of Electrical, Computer and Biomedical Engineering and the certificate's curriculum committee have approved that this certificate be discontinued, effective Fall 2019.

Enrollments in the last five years have been steady, with 30 students currently enrolled in the certificate. There have been 8 graduates from Academic Year 2015-16 to Academic Year 2017-18.

The approval of the discontinuation of this certificate was granted, contingent on the approval, by Senate, of the proposed new 4-course Certificate in Energy Management and Conservation. The certificate's Curriculum Committee and Program Advisory Council approved the discontinuation of this certificate on November 7, 2016 and again on March 4th, 2017. The FEAS Dean's Council on November 17, 2016 approved the discontinuation of this certificate. Chair Dimitri Androutsos approved the discontinuation of this certificate on October 22, 2018. The Dean of FEAS approved the discontinuation of this certificate on October 31, 2018.

A communication will be sent to current students enrolled in the Energy Management and Innovation certificate to advise them that the certificate is being discontinued but that the courses will continue to be offered. Therefore, students currently enrolled in the certificate will be able to complete it. A new certificate in Energy Management and Conservation, with a four-course graduation requirement, is pending approval by Senate, commencing delivery Fall 2019. Students wishing to transfer to the new 4 course certificate will be assessed on a case by case basis.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the Chang School discontinuation of the Certificate in Energy Management and Innovation.*

F. CHANG SCHOOL OF CONTINUING EDUCATION – New Certificate in Energy Management and Conservation

A four-course Certificate in Energy Management and Conservation is being proposed by the Department of Electrical and Computer Engineering and the Centre for Urban Energy, in collaboration with The Chang School, effective Fall 2019. The certificate's Curriculum Committee and Program Advisory Council approved this new certificate proposal document on November 7, 2016 and again on March 4th, 2017. The FEAS Dean's Council on November 17, 2016 approved this certificate. Chair Dimitri Androutsos approved this certificate on October 22, 2018. The Dean of FEAS approved this certificate on October 31, 2018.

Certificate Goals

The Certificate in Energy Management and Conservation's overarching goals equip certificate candidates with a range of knowledge and skills that include:

- Assess, implement and manage energy technologies, including green renewables and energy smart grids;
- Successfully execute energy distribution and delivery to the End user and / or customer, within demand management and conservation;
- Maximize energy innovation within the parameters of risk mitigation and management; and
- Effectively leverage and navigate large-scale energy public policy in Canada, politics and other entrepreneurial interests in the energy space or learn about renewable energy systems.

The curriculum is designed to meet the need for a new generation of professionals equipped with the advanced, technical and analytical skills in demand in Canada's and the world's energy sector. The four required courses provide students with critically important and current best practices, as well as the standards, and applied knowledge and skills in the field.

Societal Need and Target Audience

The focus of the certificate program is to deliver pertinent, practical, timely and effective education in the areas of energy and conservation. Each of these domains is widely recognized as having significant and growing societal importance with respect to electricity, natural gas, legal, financial, educational, research, public utility, local distribution companies, transmission companies, generation companies and energy institutions and infrastructure. Each is the subject of on-going intensive research and development, from the scientific, technology, legal, social and policy perspectives. Each offers its practitioners academic, professional and para-professional (technical) career opportunities and employment options.

The new certificate program is for people who aspire to work or currently are working in the energy management sector. In terms of educational aspirations based on surveys, the vast majority of respondents indicate interest in further graduate level studies, which may be another indicator of the calibre of students attracted to this Chang School certificate program.

The certificate program is also for people aspiring to work in sectors across a range of professional specializations. Certificate candidates may be:

- individuals with post-secondary education but with no experience in the sector: or
- individuals with no post-secondary education but with experience in the energy management sector.

Certificate Structure

The Certificate in Energy Management and Conservation consists of four (4) required 39-hour courses in total. None of the courses have prerequisites. These required courses are offered through Ryerson University's D2L online course management system for online delivery. All courses are OSAP eligible.

Required Courses:

CTEC 241 Energy Innovation

CTEC 269 Trends in Energy Conservation

CTEC 264 Trends in Smart Grid

CTEC 282 Public Policy in Energy

Development Plan

The new four-course Certificate in Energy Management and Conservation will be offered in Fall 2019. During Spring and Summer 2019, course assignments in the certificate courses will be authored to include assignment components that are interdisciplinary and align with the learning outcomes of each course and the certificate overall. Case studies in the energy management and conservation field will be referenced and/or authored and folded into course content. In addition, the certificate's Development Plan recommends that the standing curriculum committee assess the type of evaluation used across the curriculum in order to ensure that there is an appropriate range of skills and critical thinking development. It is also recommended that communication among instructors be encouraged to ensure symmetry and comparability of expectations and assignments across the curriculum and curriculum currency.

Admission Criteria

The new certificate does not have any required pre-requisite courses for admission. It is recommended that applicants have the following:

Mature student status and evidence of relevant college or university level coursework, or equivalent

OR

Mature student status together with relevant industrial or professional experience

Undergraduate students wishing to pursue a continuing education certificate program should be aware of possible restrictions.

Academic Management and Governance

The certificate will reside in the Office of the FEAS Dean, together with the Department of Electrical and Computer Engineering and the Centre for Urban Energy in the Faculty of Engineering and Architectural Science (FEAS). Administrative support is the responsibility of The Chang School of Continuing Education. Routine matters, both academic and administrative, are the responsibility of the Academic Coordinator in collaboration with The Chang School Program Director. The Standing Curriculum Committee includes RFA members from the Department of Electrical and Computer Engineering, Fellows from the Centre for Urban Energy and other relevant contributors.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the Chang School new Certificate in Energy Management and Conservation.*

G. CHANG SCHOOL OF CONTINUING EDUCATION – Discontinuation of the Certificate in Financial Mathematics Modeling

The Certificate in Financial Mathematics, comprised of six courses, has been delivered through The Chang School's Engineering, Architecture & Science unit since Fall 2014. Enrollments in the last five years have been steady, with 26 students currently enrolled in the certificate and 27 graduates from 2014 to 2016.

The certificate's academic home, the Department of Mathematics, first approved the discontinuation of this certificate on November 3rd, 2016. The certificate's Curriculum Committee and Program Advisory Council approved the discontinuation of this certificate on November 7, 2016, on March 4, 2017, and again on February 5, 2018. The Department of Mathematics and the new interim Chair re-approved the discontinuation of this certificate on September 19, 2018. The approval of the discontinuation of this certificate was granted, contingent on the approval by Senate, of the proposed new 4-course Certificate in Financial Mathematics Modelling and Predictive Analytics.

A communication will be sent to students enrolled in the Financial Mathematics Modelling certificate to advise them that the certificate is being discontinued but that the courses will continue to be offered. Therefore, students currently enrolled in the certificate will be able to complete it. A new certificate in Financial Mathematics Modeling and Predictive Analytics, with a four-course graduation requirement, is pending approval by Senate, commencing delivery in Fall 2019. Students currently registered in the discontinued certificate who wish to transfer to the new 4-course certificate will be assessed on a case by case basis.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the Chang School discontinuation of the Certificate in Financial Mathematics Modeling.*

H. CHANG SCHOOL OF CONTINUING EDUCATION – New Certificate in Financial Mathematics Modeling and Predictive Analytics

A Certificate in Financial Mathematics Modeling and Predictive Analytics is being proposed by Ryerson University's Department of Mathematics in collaboration with The Chang School, effective Fall 2019. The Department of Mathematics Council and the Chair approved this certificate on November 3rd, 2016. The certificate's Curriculum Committee and Program Advisory Council approved this certificate on November 7, 2016 and this certificate proposal document on March 4, 2017. The council made additional revisions and reapproved the certificate proposal on February 5, 2018. The Department of Mathematics and the new interim Chair re-approved this proposal on September 19, 2018.

Certificate Goals

The Certificate in Financial Mathematics Modeling and Predictive Analytics' overarching goals are to equip certificate candidates with a range of knowledge and skills that include:

1. To provide knowledge and a solid understanding of financial math modeling theory, methodologies, predictive models, and financial instruments to ensure accurate financial predictions.
2. To provide understanding and application of statistics and probability theory and the implications for predicting financial outcomes; provide knowledge of modeling of stock market (and market) phenomena, computing prices of financial products in order to measure, control and predict financial risk.
3. To provide opportunities for skills development in analyzing and modeling financial solutions, critical thinking and problem-solving, collaboration, flexibility and adaptability to respond to challenges or predicted crises arising in financial markets.

Societal Need and Target Audience

A large part of today's economy depends heavily on how deftly information is interpreted and used. This is most notable in cases where wealth is being managed; the delicate interrelationship between government policies, stake-holder expectations, global market forces and unexpected events, make investment, predictive financial analytics and risk analysis three areas that should be managed by experts. The complexities of these topics are compounded as businesses, managing financial institutions and markets are continuously changing because of innovation (e.g. FinTech, Bitcoin, Blockchain, etc.), competition and a plethora of external forces that require adaptation to an ever-evolving economic and financial environment.

By necessity, several areas of training in Mathematics and related disciplines are needed to approach the complex issues involved. Indeed, the financial industry employs large numbers of people with advanced and sophisticated knowledge. A background in advanced Mathematics, Financial Mathematics Modeling, Financial Predictive Analytics and Computation are essential ingredients for success in an increasing number of positions within the financial industries. Advanced mathematics is at the centre of many standard models used by the financial industry. More importantly, mathematical techniques and concepts are used to describe and predict financial markets. Therefore, mathematics acts as an important language employed by large parts of the financial community.

The certificate program is targeted toward professionals who have mature student status, have completed university coursework or one or more university degrees, and ideally have professional experience in a related field. The certificate program is also targeted to people aspiring to work in the sector from across a range of professional specializations. Certificate candidates may also be:

- individuals with university coursework, a Bachelor degree or higher but with no experience in the sector; or

- individuals with university coursework, a Bachelor degree or higher and with experience in the sector.

Certificate Structure

The Certificate consists of four (4) required 39-hour courses in total. These required courses are offered through The Chang School via in-class delivery.

Required Courses:

CMTH 500 **Mathematics:** Introduction to Stochastic Processes (prerequisite: CMTH404 or CMTH480 or CECN702)

CMTH 600 **Mathematics:** Computational Methods in Mathematics (prerequisite: CMTH501 or CMTH510)

CMTH 700 **Mathematics:** Financial Mathematics I (prerequisite: CMTH500)

CMTH 800 **Mathematics:** Financial Mathematics II (prerequisite: CMTH700)

A Laddering Course Series to the Certificate to Fulfill Pre-Requisite Course Requirements

The four certificate courses have pre-requisites. The following Course Series permits those individuals, who aspire to take the Certificate but who are identified by the Academic Coordinator as requiring one or more pre-requisite courses, to ladder into the Certificate by taking the existing Course Series in Financial Predictive Analytics. The Course Series description is below:

Course Series in Financial Predictive Data Analytics

It is to be noted that this course series is comprised of the pre-requisite courses for the Financial Mathematics Modeling and Predictive Analytics Certificate. This course series ladders to the certificate program.

Students must complete three (3) of the following courses:

Choose one (1) of the following:

CMTH380 Probability and Statistics I (39 hours)

CMTH304 Probability and Statistics I (39 hours)

CIND123 Data Analytics: Basic Methods (39 hours)

Choose one (1) of the following:

CMTH480 Probability and Statistics II (39 hours)

CMTH404 Probability and Statistics II (39 hours)

Choose one (1) of the following:

CMTH501 Numerical Analysis I (39 hours)

Development Plan

All courses already exist. However, over Spring/Summer 2019 all courses will be revised for currency, for equity, diversity and inclusion and for up-to-date best applied practices and approaches, and will be ready for delivery commencing Fall 2019.

In addition, the certificate's Development Plan recommends that the standing curriculum committee assess the type of evaluation used across the curriculum in order to ensure that there is an appropriate range of skill and critical thinking development. It is also recommended that communication among instructors be encouraged to

ensure symmetry and comparability of expectations and assignments across the curriculum and curriculum currency.

Admission Criteria

It is recommended that applicants have the following:

Mature student status and evidence of university level coursework in mathematics, economics, and/or finance, or equivalent (to be determined by the Academic Coordinator)

OR

Mature student status and other relevant qualifications or relevant industry experience (to be determined by the Academic Coordinator)

An interview/placement assessment is required for this program.

Academic Management and Governance

The academic home for this Certificate is the Department of Mathematics in the Faculty of Science.

Administrative support is the responsibility of The Chang School of Continuing Education. Routine matters, both academic and administrative, are the responsibility of the Academic Coordinator in collaboration with The Chang School Program Director. The Certificate's Standing Curriculum Committee and Program Advisory Council meet regularly at the call of the Chair or at the request of the academic coordinator, for example, to propose changes to existing courses and certificates or to consider new curriculum.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the Chang School new Certificate in Financial Mathematics Modeling and Predictive Analytics.*

I. FACULTY OF ENGINEERING AND ARCHITECTURAL SCIENCE – Course Grading Variations

1. Introduction

It is proposed that the Faculty of Engineering and Architectural Science courses listed below include grading variations, as follows:

In order for a student to pass a course identified in the departmental lists provided below, in addition to earning 50% or more of the overall course mark, the student must pass:

- the weighted combination of the quiz, midterm and final exam marks by earning 50% or more, AND
- the laboratory component by earning 50% or more, if there is a laboratory component.

In the respective course outline, the quiz, midterm test, final exam, and laboratory components should be clearly designated and the weight for each component should be given.

Department of Chemical Engineering

CHE214, CHE215, CHE217, CHE319, CHE413, and CHE430

Department of Electrical, Computer, and Biomedical Engineering

BME100, BME229, BME323, BME328, BME406, BME423, BME501, BME506, BME516, BME532, BME538, BME632, BME639, BME674, BME700, BME703, BME704, BME705, BME772, BME777, BME800, BME802, BME804, BME808, BME809, BME872,

COE318, COE328, COE428, COE501, COE528, COE538, COE608, COE628, COE700, COE718, COE758, COE768, COE800, COE817, COE818, COE838, COE848, COE865,

EES512, EES604, EES612,

ELE202, ELE302, ELE401, ELE404, ELE504, ELE531, ELE532, ELE614, ELE632, ELE635, ELE637, ELE639, ELE700, ELE707, ELE709, ELE714, ELE719, ELE724, ELE725, ELE734, ELE745, ELE746, ELE754, ELE792, ELE800, ELE801, ELE804, ELE806, ELE809, ELE815, ELE819, ELE829, ELE846, ELE861, ELE863, ELE882, ELE884, ELE885, ELE888

Department of Mechanical and Industrial Engineering

MEC222, MEC309, MEC311, MEC322, MEC323/BME323, MEC325, MEC411, MEC430, MEC431, MEC511, MEC514, MEC516/BME516, MEC531, MEC613, MEC616, MEC617, MEC626, MEC701, MEC709, MEC713/IND713, MEC721, MEC733, MEC740, MEC751, MEC809, MEC810, MEC811, MEC813/IND810, MEC816, MEC817, MEC832/IND832, MEC850, MTL200, MTL300, MTL700, BME100, BME423, IND300, IND303, IND400, IND405, IND508, IND600, IND604, IND605, IND708, IND710, IND712, IND816, IND833

2. Rationale

The majority of courses offered by the engineering departments listed above have three major groups of assessment:

- Group A - assessments of explicit knowledge (e.g., quizzes, midterm tests, and final exam),
- Group B - assessments of hands-on practical knowledge (e.g., laboratory work and reports), and
- Group C - other assessments (e.g., assignments, presentations, and project reports).

The licensure requirements for an applicant to practice professional engineering in Canada normally include meeting the stipulated academic requirements, fulfilling the engineering work experience requirements, and successfully completing the Professional Practice Examination. Holding an undergraduate engineering degree from a Canadian Engineering Accreditation Board (CEAB)-accredited program will meet the stipulated academic requirements for licensure. Therefore, to ensure that each graduate meets the academic requirements, it is necessary to require a student to pass the assessments in explicit knowledge (Group A) and hands-on practical knowledge (Group B) separately. A student has to demonstrate minimal competency on both. The primary purposes of other assessments (Group C) are to advance learning.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the Faculty of Engineering and Architectural Science course grading variations.*

J. DEPARTMENT OF PHYSICS – Course Grading Variations

1. Introduction

It is proposed that the first year physics courses listed below include course grade variations, as follows:

Students must pass the lab component (50% of lab component, i.e. min. 10% in final grade should be for labs where labs are worth 20% of overall grade), as well as separately pass theory component (50% of theory component, i.e. min. of 40 % in the final grade should be for theory, where ‘theory’ includes all other assessments, such as exams, midterms, quizzes, tutorial work) in the following courses:

PCS120 – Physics I

PCS130 – Physics 2

PCS125 – Physics: Waves and Fields

PCS211 – Physics: Mechanics

PCS228 – Electricity and Magnetism

These grade variations will be clearly communicated through the respective course outline information as well as through the course management form. Students who fail to pass either the lab or the theory course component but have earned an overall passing grade in the course will be given an opportunity to redeem their failed grade in one or more of the following ways:

A - During the semester, all missing lab experiments by students will be communicated to the Physics Lab Coordinator (technical staff dedicated to physics lab coordination). The lab coordinator will try to accommodate the student in another session of the lab that s/he has missed as soon as possible.

B - Dept. of Physics holds a week of makeup lab during the last week of each term. The physics lab coordinator along with a few lab GAs will accommodate all remaining students with missed labs during that week.

C - Opportunity to write a supplementary final exam.

2. Rationale

The grading scheme ensures that students gain knowledge and skills for both integral components of physics: experimentation and theory. The courses subject to this grading variation are ALL first-year physics courses. Enrollments in these courses are typically large and their lab components constitute 5 simple physics experiments for the entire course in a given semester. The implemented grading variation is an effective method to ensure students pass the course with the required knowledge gained in the theory component of the course as well as with the experiential learning component provided during the laboratory experiments. The grading variation has been implemented and conducted successfully in these first-year physics courses for many years.

The upper year physics courses also have laboratory components. However, due to the maturity of students, their developed habit of attending the labs, and a better understanding of the role of laboratory experiments in their education, we do not see the need to build in these grading variations in upper year courses.

Recommendation

Having satisfied itself of the merit of this proposal, the Academic Standards Committee recommends: *That Senate approve the Department of Physics course grading variations.*

J. For Information: CHANG SCHOOL CERTIFICATES - REVISIONS (March 2019)

- i. Certificate in Canadian Social Work Practice: Course Deletion (Elective) and Course Repositioning (Move from elective to required)
- ii. Certificate in Applied Digital Geography and GIS and Certificate in Advanced Applied Digital Geography and GIS: Clarification of Language (Electives)
- iii. Certificate in Design for Arts and Entertainment: Course Deletion; Course Addition (Elective)
- iv. Certificate in Film Studies: Course Additions and Deletions (Electives)
- v. Certificate in Project Management: Revision of CKPM Certificate Courses
- vi. Certificate in Public Relations: Course Deletion: Course Addition (Elective)
- vii. Certificate in Photography Studies: Course Addition (Elective)

Respectfully Submitted,

Kelly MacKay, Chair for the Committee

ASC Members:

Charmaine Hack, Registrar

Donna Bell, Secretary of Senate

Kelly MacKay, Chair and Vice Provost Academic

Denise O-Neil Green, Vice President/Vice Provost, Equity and Community Inclusion

Bettina West, Director, Curriculum Quality Assurance

Dan Horner, Faculty of Arts, Criminology

Stephanie Walsh-Matthews, Faculty of Arts, Arts & Contemporary Studies

Bob Clapperton, Faculty of Communication & Design, Professional Communication

Thomas Tenkate, Faculty of Community Services, Occupational and Public Health

Annette Bailey, Faculty of Community Services, Nursing

Andy Gean Ye, Faculty of Engineering and Architectural Science, Electrical & Computer Engineering

Donatus Oguamanam, Faculty of Engineering and Architectural Science, Mechanical & Industrial Engineering

Noel George, Faculty of Science, Chemistry & Biology

Jeffrey Fillingham, Faculty of Science, Chemistry & Biology

Christopher Gibbs, Ted Rogers School of Management, Hospitality and Tourism Management

Donna Smith, Ted Rogers School of Management, Retail Management

Val Lem, Library

Linda Koechli, Chang School of Continuing Education

Dalia Hanna, Chang School of Continuing Education

Jacob Circo, Student

Yelda Nuri, Student