

**SENATE MEETING AGENDA**

**Tuesday, May 1, 2012**

**4:30 p.m.** Light dinner will be served.  
**5:00 p.m.** Meeting starts (in the Commons – POD-250)

1. Call to Order/Establishment of Quorum
2. Approval of Agenda
3. Announcements
- Pages 1-3 4. Minutes of Previous Meeting  
**Motion:** *That Senate approve the minutes of the April 3, 2012 meeting*
5. Matters Arising from the Minutes
6. Correspondence
7. Reports:
  - 7.1 Report of the President
    - Pages 4-7 7.1.1 President’s Update
    - Pages 8-15 7.1.2 Achievement Report
  - 7.2 Report of the Secretary  
 - CESAR Senate representative
  - 7.3 Presentation by the Vice Provost Academic – Summary of the forthcoming Curriculum Renewal Committee White Paper
  - 7.4 Committee Reports
    - Pages 16-28 7.4.1 Report #W2012-1 of the Senate Learning and Teaching Committee
    - Pages 29-33 7.4.2 Report #W2012-4 of the Academic Standards Committee  
**Motion #1:** *That Senate approve the proposed Certificate in Energy Management and Innovation*
    - Pages 33-36 **Motion #2:** *That Senate approve the proposed Certificate in Advanced Nursing Leadership and Management*
    - Pages 36-39 **Motion #3:** *That Senate approve the proposed Chang School Certificate in Infrastructure Asset Management and Renewal*
    - Pages 39-42 **Motion #4:** *That Senate approve the proposed Chang School Certificate in Robotics and Embedded Systems*
    - Pages 43-46 **Motion #5:** *That Senate approve the proposed Chang School Certificate in Mining Management*

Pages 46-59                      **Motion #6:** *That Senate approve the proposed Bachelor of Science degree program in Biomedical Sciences*

Pages 59-69                      **Motion #7:** *That Senate approve the proposed Bachelor of Commerce degree program in Real Estate Management*

Pages 70-82                      7.4.3    Report #W2012-1 of the Yeates School of Graduate Studies:  
**Motion:** *That Senate approve the Option in Medical Physics in the PhD and MSc Physics program, as approved by YSGS Council at its April 12, 2012 meeting*

8.     Old Business
9.     New Business as Circulated
10.    Members' Business
11.    Consent Agenda
12.    Adjournment

<b>MINUTES OF SENATE MEETING</b>			
<b>Tuesday, April 3, 2012</b>			
<b>MEMBERS PRESENT:</b>			
<b>Ex-Officio:</b>	<b>Faculty:</b>		<b>Students:</b>
K. Alnwick	H. Alighanbari	A. Rauhala	S. Bentley
J. P. Boudreau	T. Antimirova	A. Saloojee	K. Brown
G. R. Chang	M. Braun	C. Schryer	T. Ly
W. Cukier	D. Chant	M. Sharpe	W. Manzoor
G. Fearon	D. Checkland	N. Walton	A. McAllister
J. Hanigsberg	R. Church	K. Webb	G. Morshed
G. Hauck	D. Denisoff	A. Wellington	S. Ortiz
J. Isbister	M. Dionne		U. Asagwara
K. Jones	D. Elder		V. Ovoian
M. Lachemi	L. Fang		M. Palermo
H. Lane Vetere	A. Ferworn		
M. Lefebvre	A. Furman		
S. Levy	V. Lem		
J. Mactavish	J. Martin		
A. Shepard	D. Mason		
P. Stenton	A. Miri		
<b>SENATE ASSOCIATES:</b>			<b>ALUMNI:</b>
M. Lee Blickstead			
A. M. Brinsmead			C. Demetriades
<b>REGRETS:</b>	<b>ABSENT:</b>		
R. Banerjee	H. Canas		
T. Barnett	M. Coomey		
R. Boyagoda	K. El Sayed		
C. Evans	S. El-Tawil		
J. Girardo	L. Salvador		
U. George	J. Turtle		
N. Hamzavi	R. Zanussi		
A. Kahan			
L. Lavallée			
K. Raahemifar			
R. Ravindran			
D. Rose			
J. Saber			
F. Tang			
Z. C. Zhuang			

Senate Discussion Topic: Student Experience – presented by H. Lane Vetere, Vice Provost Students and A. McAlister, Senate student representative.

1. Call to Order/Establishment of Quorum

2. Approval of Agenda

Moved by J.P. Boudreau; seconded by L. Fang

**Motion approved.**

3. Announcements - none

4. Minutes of Previous Meeting

**Motion:** *That Senate approve the minutes of the March 6, 2012 meeting*

Moved by G. Hauck; seconded by D. Mason

**Motion approved.**

5. Matters Arising from the Minutes - none

6. Correspondence - none

7. Reports:

7.1 Report of the President

7.1.1 President's Update

7.1.2 Achievement Report

7.2 Reports:

7.2.1 Report of the Vice President Administration – J. Hanigsberg

7.2.2 Report of the Vice Provost Students – H. Lane Vetere

7.3 Report of the Secretary

7.3.1 Senate Election Results – 2012-2013

7.4 Committee Reports

7.4.1 Report #W2012-3 of the Academic Governance and Policy Committee:

**Motion #1:** *That Senate approve the name of the Department of French and Spanish be changed to Department of Languages, Literatures and Cultures, effective fall 2013.*

Moved by J. P. Boudreau; seconded by D. Denisoff

**Motion approved.**

7.4.2 Report #W2012-1 of the Senate Priorities Committee

7.4.3 Report of the Scholarly Research and Creative Activity Committee

**Motion:** *That Senate approve the revised terms of reference of the terms of reference of the Scholarly Research and Creative Activity Committee as presented in this report.*

Moved by N. Walton; seconded by K. Jones

**Motion approved.**

- 7.4.4 Report W2012-3 of the Academic Standards Committee  
**Motions #1:** *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.*

Moved by G. Hauck; seconded by D. Chant  
**Motion approved.**

**Motion #2:** *That Senate approve the proposed Certificate in Financial Mathematics Modeling.*

Moved by K. Jones; seconded by M. Sharpe.  
**Motion approved.**

**Motion #3:** *That Senate approve the proposed Optional Specialization in Digital Entrepreneurship and Innovation.*

Moved by J. Mactavish; seconded by J. P. Boudreau.  
**Motion approved.**

**Motion #4:** *That Senate approve the proposed Bachelor of Science degree program in Financial Mathematics.*

Moved by L. Fang; seconded by G. Fearon  
**Motion approved.**

8. Old Business
9. New Business as Circulated
10. Members' Business  
The President announced N. Walton as the new COU representative; and Vice Chair of Senate. He also thanked current COU representative, A. Wellington.
11. Consent Agenda
12. Adjournment  
Meeting adjourned at 6:45 p.m.

Respectfully submitted,

Mark Lovewell  
Interim Secretary of Senate

**Ryerson University  
President's Update to Senate  
May 1st, 2012**



Everyone Makes a Mark

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**60th Anniversary** – Special congratulations and best wishes are extended to the Ted Rogers School of Hospitality and Tourism Management, which celebrated its Diamond Anniversary on April 4th with memorabilia, pictures, reconnecting faculty and alumni, and superb refreshments designed and prepared by the students. One of the earliest signature programs bringing international esteem to the university, it is remarkable to recognize its beginnings in 1951/52 as Hotel Resort and Restaurant Administration, with 49 students and 8 faculty and staff, and its growth to 675 full-time students and more than 1300 applications annually for 215 first-year places, with its culture of diversity, urban sophistication and innovative leadership.

**Red Rose Ball** – On April 11th, The Honourable William Davis was honoured with the 2012 Award of Merit by The St. George's Society of Toronto; and, as the recipient of the award, selected Ryerson University as his choice to be the primary beneficiary of funds raised by the event. Although Premier Davis was unable to attend for reasons of health, he is recovering well and all of us in the Ryerson community extend our very best wishes and special thanks.

**Welcome** – Constance L. Sugiyama, one of Canada's leading corporate lawyers and former Deputy Chair and Partner of Fraser Milner Casgrain LLP has joined the university as a distinguished visiting scholar in the Ryerson Law Research Centre for a two-year term.

**In Memoriam** – Angela Ross, staff representative of CUPE Local 3904, passed away in late March following a brief illness. She was a founding member of Local 3904, its first chief steward, and the local president until 1990 when she began a career with CUPE. She was a dedicated leader and business manager, respected for her expertise and ability to develop solutions, and consulted beyond Ryerson for her knowledge and perspective. She will be missed by us all.

**Congratulations** –

- Chancellor G. Raymond Chang is being honoured by two organizations for outstanding leadership, receiving the 2012 Most Outstanding Asian Canadian Award from the Canadian Multicultural Council (Asians in Ontario), and the Tropicana President's Award from Tropicana Community Services for contributions to Canadian and Caribbean communities.
- Maurice Mazerolle, Ted Rogers School of Business Management, has been awarded the Morley Gunderson Prize by the Centre for Industrial Relations and Human Resources at the University of Toronto, for outstanding professional achievement and significant service to the Centre by its graduates.
- Debora Foster, Department of Chemistry and Biology, has been named a recipient of the Queen Elizabeth II Diamond Jubilee Medal in recognition of her contributions to the Royal Canadian Institute for the Advancement of Science.
- The Ontario Association of Architects has awarded its 2012 Landmark Award to Lett/Smith Architects for the Ryerson Recreation and Athletics Centre (RAC); and a Proposals/Concepts Award to Maya Janikowski (Master of Architecture '11) for *This is (NOT) a Laneway*.

**Year-End Events:** This time of year features annual showcases in many programs and Schools, events which are very effective in advancing the unique strength of Ryerson. It is a privilege to congratulate students in all disciplines, as well as their professors, and every member of the staff and community whose participation and support contribute so much to student success.

**3M National Student Fellowship Award** – Chuck Howard, 2nd year Economics, is one of 10 inaugural recipients of the new 3M award recognizing outstanding student leadership and vision that extends the impact of education. Among his initiatives and achievements, he has volunteered in Vietnam as a teacher and social support centre care worker, and an elementary school teacher in Rwanda, and will spend this summer in Malawi as a junior fellowship winner for Engineers Without Borders. In Toronto, he has volunteered for Cross Town Kitchens, a restaurant group that raises funds for community food centre The Stop, and the Canadian Opera Company. At Ryerson he is co-chair of the Arteries Undergraduate Research Conference, a TA in economics, committee member of the Faculty of Arts Student Project Grant, class representative for the Economics Course Union and a delegate on the Ryerson Model United Nations team.

**Diversity Teaching Fund** – The following twelve proposals have been funded in the inaugural round of the multi-year fund created by the Learning and Teaching Office (LTO) and supported by the Office of the Provost. The projects will contribute to a resource (webpage, publication, best-practices tips) that will be available to all Ryerson community members, and outcomes will be presented at the faculty conference in May 2013.

- Janet Chappell, School of Nutrition, Faculty of Community Services, "Looking Back, Moving Forward: Positioning Aboriginal Nutrition and Food Challenges"
- Henry Navarro Delgado, School of Fashion, Faculty of Communication and Design, "Contemporary Perspectives on Non-Western Fashion"
- Elaine Frankel, Teaching Chair, School of Early Education, Faculty of Community Services, "Voices of Diversity: Digital Narratives in the Classroom"
- Jean Golden, Department of Sociology, Faculty of Arts, "Racialized and Newcomer Youth: Beyond the Talk"
- Esther Ignagni, School of Disability Studies, Faculty of Community Services, "Exploring the Intersections Between Disability, Madness and LGBTQ Identity and Health"
- George Thomas Kapelos, Department of Architectural Science, Faculty of Engineering, Architecture and Science, "Narratives of Architecture / Narratives of Diversity: Developing and Expanding Self and Other Awareness of Issues of Diversity, Equity and Inclusion"
- Lynn Lavallee, School of Social Work, Faculty of Community Services, "Francophone Realities in Social Work Education"
- Joseph Medaglia, School of Fashion, Faculty of Communication and Design, "LGBTQ: Theory, Research and Resources at Ryerson University"
- Emily van der Muelen, Department of Criminal Justice and Criminology, Faculty of Arts, "Studying Gender, Sexuality and Race: New Course Development for Criminal Justice and Criminology"
- Alireza Sadeghian, Department of Computer Science, Faculty of Engineering, Architecture and Science, "Making Mathematical Graphs Accessible for Blind Students with MATLAB"
- Hyacinth M. Simpson, Department of English, Faculty of Arts, "Caribbean Poetry: Olive Senior's Gardening in the Tropics"
- Joyce Smith, School of Journalism, Faculty of Communications and Design, "Media, Religion and Culture: A New Way of Introducing Undergraduate Students to Religion"

**School of Image Arts Building Re-opening**– On March 21st the university officially reopened the rebuilt and expanded School of Image Arts Building. The Ryerson Image Centre has also announced its grand opening September 29th, 2012 with *Archival Dialogues: Reading the Black Star Collection*, an exhibition focusing on the Black Star Collection of historic black and white photojournalistic prints, as seen through the eyes of internationally-renowned Canadian contemporary artists Stephen Andrews, Christina Battle, Marie-Hélène Cousineau, Stan Douglas, Vera Frenkel, Vid Ingelevics, David Rokeby and Michael Snow.

**Ryerson Square** – With the permanent closure of Gould Street, on March 28th the space officially opened as ‘Ryerson Square’ and we look forward to its continuing development as a vibrant campus hub. During the academic term, a group of Urban and Regional Planning students guided by Professor Nina-Marie Lister worked with Ryerson administrators on a project called ‘Winterscape,’ integrating the university's master plan with urban, environmental and landscape design strategies and elements such as projections, lighting, food cart vendors, a carnival and distinctive signage to suggest ways to enliven Gould Street in winter.

**Pathways to Education** – In late March, the Tri-Mentoring Program (TMP) and Ryerson Aboriginal Student Services (RASS), in partnership with Pathways to Education Regent Park, hosted 14 high school students from Pathways to Education Winnipeg as part of an exchange visit to Toronto. Ryerson presented *A Day in the Life* featuring a panel of first-generation ambassadors sharing their life experiences; a workshop on postsecondary options after high school; a mock lecture with Social Work professor Cyndy Baskin; and a campus tour. Students were chosen for the trip based on essays explaining why the exchange would be beneficial to them and why they wanted to go to Toronto, and had the opportunity to sightsee, volunteer at the Yonge Street Mission, and spend a day with the chef at the Ritz Carlton Hotel.

**Earth Hour 2012** – On March 31st Ryerson did its part, with a crew from Campus Facilities and Sustainability turning off most of the lights in and around Ryerson buildings for 60 minutes, while still keeping safety in mind.

**Ryerson Awards Night** – The inaugural Ryerson Awards Night on April 4th celebrated excellence in teaching, research, service and administration with the presentation of previously announced awards, and the introduction of the President's Blue & Gold Award of Excellence recognizing administrative individuals and teams whose contributions represent Ryerson values. Tony Conte, director of the Office of Vice Provost, Students, was the first individual Blue & Gold Award recipient, and the team award went to the Email & Collaborative Tools Team.

**Digital Media Zone 2nd Anniversary** – On April 10th the Ryerson DMZ hosted an Open House celebrating the role of young entrepreneurs in building Canada's digital media economy. Achievements include: 41 start-ups incubated and accelerated; more than 64 projects initiated; 382 jobs created and fostered; 8 companies graduated; and 432 media and industry tours.

**Student Learning Centre ‘Design Our Digs’** – From April 10-12th Ryerson students, faculty and staff were invited to test proposed SLC furniture – chairs, loungers, stools, desks, tables and bean bags – and to complete a scorecard rating durability, comfort, functionality and appearance. The SLC design process is committed to engaging with the Ryerson community, and RCG Inc., the firm handling the furniture design, planning and procurement services for the SLC, is making it a point to include client input in its project development and decision-making process.



**Annual Athletic Awards** – Ryerson’s celebration of student-athletes was an outstanding occasion notable for dedication, enthusiasm and support. The momentum and spirit of our Varsity Rams is reflected not only in their athletic performance, but in community leadership and philanthropic activities which represent the university so well. For the second straight year, the H.H. Kerr Female Athlete of the Year is Ashley MacDonald (Sociology), 5th-year Basketball guard and OUA first-team all-star. The Ryersonian Male Athlete of the Year is Viktor Anastasov (Politics and Governance), 2nd-year Soccer striker and OUA first-team all-star.

**25-Year Club** – On May 24th, 2012 we will honour long-service Ryerson faculty and staff whose contributions have played a significant part in the development of the university over a period of remarkable progress and change. I look forward to this event with enjoyment every year, as we induct new members and welcome 25-Year Club members from the past. It is a superb opportunity to share the stories, the history and the spirit that make Ryerson great.

**Name-Your-Seat** – Ryerson has launched a program offering an opportunity to support the new Mattamy Athletic Centre at the Gardens by naming a seat in the arena. A donation of \$500, or \$750 for a seat in Row 1, offers the public posterity of a plaque recognizing the historic renewal of an iconic Canadian landmark, and supports Ryerson and community sports – and donors will be invited to bring a guest for a skate. To select your seat, visit [www.ryerson.ca/nameyourseat](http://www.ryerson.ca/nameyourseat).

**Ryerson Legal Clinic** – Led by the Ryerson Law Research Centre, a partnership including the university, the Ryerson Students’ Union, Pro Bono Law Ontario and Miller Thomson LLP will provide access for Ryerson students to a monthly legal clinic focusing on business start ups, employment law, personal tax, personal debt, consumer law, small claims court preparation assistance and referrals to other organizations or sources of information. In 2012-13, company lawyers will also support experiential learning by providing guidance to teams of fourth-year commerce students offering advice to Ryerson student entrepreneurs.

#### **Government and Institutional Relations –**

*Note:* We continue to engage on an ongoing basis with ministers and officials at all levels of government to discuss shared priorities and academic advancement.

*March 20, 2012:* Ontario premier Dalton McGuinty and Minister of Health and Long-Term Care Deb Matthews were on campus to announce the creation of two midwifery-led birthing centres in the province, as part of Ontario's Action Plan for Health Care.

*March 22, 2012:* The Hon. Chris Bentley, Minister of Energy, was on campus to tour the Centre for Urban Energy and to announce lowered rates for future wind and solar energy projects. Meeting with students who are working on various CUE projects, the Minister stated it was clear that Ontario is truly a global leader and “the future is here.”

*March 30, 2012:* I attended the Canadian Club lunch to hear The Hon. Jim Flaherty, federal Minister of Finance, deliver a speech highlighting the federal budget.

*April 16, 2012:* Ryerson is hosting a delegation from Brazil for a number of days to discuss areas of academic and institutional collaboration.

*April 17, 2012:* I will be participating in the Mayor’s Business Roundtable on Economic Development at the Ontario Investment Trade Centre.

## RYERSON ACHIEVEMENT REPORT

*A sampling of achievements, notable events on campus and appearances in the media by members of the Ryerson community for the May 2012 meeting of the Ryerson Senate.*

Ontario Premier Dalton McGuinty visited Ryerson to announce the creation of new birthing centres in the province. The visit and announcement were reported by the Toronto Star, quoting student Vanessa Devotta <http://bit.ly/GEkEvK>, CP24 <http://bit.ly/GAZcdH>, Toronto Sun <http://bit.ly/GBx1Kt>, CBC Radio Metro Morning, Midday News, Winnipeg Free Press <http://bit.ly/GDCKzu>, CBC.CA <http://bit.ly/GATzca>, 24 Hours Toronto, CityNews Toronto <http://bit.ly/GBEIMg>, Globaltv.com, Epoch Times <http://bit.ly/GFitHz>, and CICS-FM.

Governor General David Johnston toured the Digital Media Zone. His visit was covered by the Globe and Mail <http://bit.ly/ws7be7>, Ming Pao Toronto <http://bit.ly/GEn4hB>, 1310 News (Ottawa) and OMNI News: Cantonese Edition.

Digital Journal reported on Minister of Energy Chris Bentley's visit to Ryerson, profiling the Centre for Urban Energy, <http://bit.ly/GRrjTG>. The event was also covered by CFRB, the Toronto Star <http://bit.ly/GPEG7o>, Toronto Sun <http://bit.ly/GQV7zM>, Canoe.ca <http://bit.ly/GNCT2D>, the Observer <http://bit.ly/GK0OjU>, Barrie Examiner <http://bit.ly/H3Wb1l>, and London Free Press <http://bit.ly/GHKkBF>.

**President Sheldon Levy** and Ryerson engineering students appeared on Global TV Toronto on the occasion of the annual RyEng bug push. Inside Toronto also reported on the event <http://bit.ly/zwZLRt>.

OMNI News: South Asian Edition coverage of International Women's Day featured **Wendy Cukier**, vice-president of research and innovation. She also spoke to about a diversity conference in Toronto. <http://bit.ly/GWH2QN> The Law Times quoted Dr. Cukier and **Julia Hanigsberg**, vice-president of finance and administration, in an article about GTA law firms lacking in diversity <http://bit.ly/FVYu42>.

680 News, CP24, the Toronto Star, Toronto Sun and the National Post reported on the Mattamy Athletic Centre, a story pitched by Ryerson Public Affairs. <http://bit.ly/GRF4ol>, <http://natpo.st/HgQMTv>. Similar articles appeared in blogTO <http://bit.ly/GS8rVb>, and the Torontoist <http://bit.ly/GQTft8>. An article on the changing face of hockey's oldest arenas in The Atlantic Cities profiled Ryerson's new athletic centre <http://bit.ly/w89ANr>. CBC Radio's Here and Now reported on findings after the opening of the time capsule at Maple Leaf Gardens, a story pitched by Public Affairs.

The Times of India profiled Ryerson alumnus and filmmaker **Joginder Singh Kalsi**. <http://bit.ly/HtHb2a>

The New York Times quoted **Tony Burman**, Velma Rogers Research Chair, School of Journalism, in an article about the narrative of war. <http://nyti.ms/xgng6g>

The Toronto Star profiled research by graduate student **Wei Su** on the topic of preschoolers and social issues pertaining to overweight kids, a story pitched by Public Affairs <http://bit.ly/I5GQNV>. The article also appeared in Metro News <http://bit.ly/HvK3Zt>, Med India, quoting co-author **Aurelia Di Santo** <http://bit.ly/HEPvcA>; Times Colonist <http://bit.ly/I5GQNV>; Star Phoenix <http://bit.ly/Hf2ySt>; Medical Xpress <http://bit.ly/HabN50>; Ottawa Citizen <http://bit.ly/Hk07cL>; CFX (Victoria); Global Regina; Postmedia News; Global Saskatoon <http://bit.ly/HlasZK>, Windsor Star <http://bit.ly/He6156>, Science Daily <http://bit.ly/Hc5mvp> and Times of India <http://bit.ly/H8xrcK>.

A Globe and Mail cross-Canada snapshot of cutting-edge researchers in universities profiled professors **Martin Antony** and **Victor Yang** <http://bit.ly/GXjuMC>

The Globe and Mail reported on the Rams basketball team at the CIS championship, quoting athletic director **Ivan Joseph** and coach **Roy Rana**. <http://bit.ly/xRoKWR> Similar articles appeared in the Toronto Star <http://bit.ly/xm3uv4>, National Post, Ottawa Citizen <http://bit.ly/AkUbnz>, Edmonton Journal <http://bit.ly/z8o9Ad>, and London Free Press <http://bit.ly/xWb9n1>. CBC Radio coverage of the championships mentioned the Ryerson Rams and the Canadian University Press reported on Ryerson's historic basketball season <http://bit.ly/yGokzK>.

The Toronto Star profiled journalism researchers **Lisa Taylor** and **Ivor Shapiro** in an article about the role of press councils in the digital age. <http://bit.ly/HG6da4>

Canadian Architect reported that the Ryerson Athletic Centre won the Landmark Award from the Ontario Association of Architects <http://bit.ly/HJTfik>.

CBC Radio's Metro Morning and Rabble.ca reported that **Pamela Palmater** was named a YWCA Woman of Distinction <http://bit.ly/y8BWe9>. Palmater also spoke to Canadian Press, the Winnipeg Free Press <http://bit.ly/GQUFnH>, 680 News, Global Maritimes and other broadcast outlets about the budget and the federal government's relationship with First Nations communities. She was quoted in a Postmedia News article about education being just one of many priorities for aboriginals. The article also appeared in Alaska Highway News <http://bit.ly/Hh6fc1>, the Montreal Gazette <http://bit.ly/Hh6fc1>, Vancouver Sun <http://bit.ly/GVDxwA>, TopNews Today <http://bit.ly/Hil5cd>, and The First Perspective <http://bit.ly/H2Vdoh>. Palmater appeared on APTN Winnipeg and CBC News discussing the federal budget as a potential turning point for native schools. <http://bit.ly/H6pNcV>.

Canadian Jewish News profiled the Sustaining Memories Project and The Chang School <http://bit.ly/HB5983>. The project was also profiled by Shalom Life <http://bit.ly/HY7xH4>.

The Council of Ontario Universities reported that the DMZ celebrated its two-year anniversary, a news release pitched by Public Affairs <http://bit.ly/HKwL81>. CBC Radio's Here and Now spoke to Director **Valerie Fox** and alumnus **Chris Nguyen**. Listen here: <http://bit.ly/HB5zLT>. The anniversary was also reported in ITBusiness.ca <http://bit.ly/HsYCPH> and Broadcaster <http://bit.ly/HZjBWx>.

Yonge Street Media quoted **Michael Carter**, coordinator for the Digital Specialization program, a story pitched by Public Affairs, <http://bit.ly/HEjBLY>. Mediacaster profiled the new Digital Specialization, quoting **Valerie Fox**, director, Digital Media Zone <http://bit.ly/lxyqlr>. The new program was also profiled by Academica.ca.

**Chris MacDonald**, Ted Rogers School of Management, spoke to the Toronto Star about Change.org and online petitions. <http://bit.ly/HPQqUa>. He also spoke to CTV News and CFRB about synthetic meat <http://bit.ly/A1NnYs>.

The Jamaica Observer profiled a Sandals partnership with Ryerson to provide hospitality certification through Sandals Corporate University <http://bit.ly/HcQseV> and <http://bit.ly/HdChAb>. The new program was also profiled in the Bahamas Tribune <http://bit.ly/GO0CO8>.

The National Post profiled Ryerson TedX. <http://natpo.st/HAWdat>

J-Source.ca profiled the Ryerson Review of Journalism. <http://bit.ly/HI4Zgo>

Bloomberg Businessweek profiled the Ryerson partnership with Pro Bono Law Ontario and Miller Thomson LLP to provide legal support for students <http://bit.ly/loBPUD>. Similar articles appeared in the National Post <http://natpo.st/HAVXR3>, Yahoo! News <http://yhoo.it/ljQPIC>, Digital Journal <http://bit.ly/Huv5VQ> and the Sacramento Bee <http://bit.ly/lvNHjk>

blogTO profiled the Ryerson University Film Festival 2012. <http://bit.ly/lr2WuP>

Global TV Toronto profiled the Act II Studio at the Chang School, quoting Dean **Gervan Fearon** and **Vrenia Ivonoffski**, founding artistic director. <http://bit.ly/GM8xhV>

The Toronto Star quoted **Lucia Dell'Agnes**, Fashion, in an article about the NBC television show Fashion Star. <http://bit.ly/Hxlfz2>

**Vinita Srivastava**, Journalism, was quoted in the Toronto Star about the season finale of *the fifth estate* which asked viewers to participate in a live and interactive show. <http://bit.ly/Hk3ExV>

The Toronto Star and Hamilton Spectator quoted **Steve Tissenbaum**, TRSM, in an article about Canadian retailer SSENSE's music video that allows viewers to watch and shop. <http://bit.ly/l7fVA9>

Graphic Arts Magazine profiled the annual colloquium hosted by Ryerson's School of Graphic Communications Management. <http://bit.ly/HbbJos> The event was also covered by Print CAN. <http://bit.ly/HuvLK3>

Postmedia News quoted **Rena Mendelson**, Nutrition, on the topic of unhealthy snacks. The article appeared in The Leader-Post <http://bit.ly/Hu28tC>, Star Phoenix <http://bit.ly/HhR4xS>, Winnipeg Free Press <http://bit.ly/H9AYbg>, Vancouver Sun <http://bit.ly/HLHJMb>, Calgary Herald <http://bit.ly/H59Tpe>, and Edmonton Journal <http://bit.ly/HJ1bsW>.

The Fort Saskatchewan Record profiled the Chang School and Learning Success Centre, quoting Dean **Fearon**.

The Toronto Star reported that Radio Ryerson was among the applicants for the 88.1 FM frequency.

The National Post quoted **Marta Braun**, Image Arts, about a new exhibit of portraits without flesh. <http://natpo.st/HULm1Y>

**Jonathan Farrar**, TRSM, spoke to Digital Journal about stress-reducing tips for filing tax returns. <http://bit.ly/Hh9MHL>

CBC Television News and NOW profiled the Mass Exodus fashion show, <http://bit.ly/Hnfohz>, a story pitched by Public Affairs.

The Montreal Gazette profiled Fashion alumna and designer **Anastasia Lomonova** <http://bit.ly/Hi0nzE>.

**Eric Kam**, Economics, spoke to Global Winnipeg, Global Toronto, Global Montreal and Global Maritimes about gasoline prices.

Global Toronto profiled Ryerson students volunteering to teach elementary school children.

The Toronto Star profiled recent Ryerson alumnus **Jesse McLean**, who was named Canada's best young journalist. <http://bit.ly/H8ZAvJ>

The Globe and Mail reported on the certificate in physical activity, fitness and lifestyle assessment at Ryerson. <http://bit.ly/HMq5Km>

Business Insider quoted **Kristyn Scott**, TRSM, in an article about the Millennial generation taking on leadership roles in new ways. <http://read.bi/Hz3ZHS>

Inside Toronto profiled alumni **Ross McAuley** and **Mike Kolberg** and their film honouring the 100<sup>th</sup> anniversary of the Revue Cinema on Roncesvalles. <http://bit.ly/Ha11iU>

The National Post profiled the Chefs for Peace initiative at Ryerson. <http://bit.ly/HteKuA>

Urban Toronto reported that the School of Image Arts Building reopened its doors. <http://bit.ly/GSJBAX>

**Bryan Evans** appeared on TVO's The Agenda discussing the politics of austerity. Watch <http://bit.ly/HImUEU>. He also spoke to CityNews and BNN discussing the budget, and to lapresse.ca <http://bit.ly/GODd1P>. He was quoted in coverage of the by-election in the Toronto-Danforth riding in the Canadian Press, Global News <http://bit.ly/GBJAWk>, MSN News <http://on-msn.com/GB94VH>, Globe and Mail <http://bit.ly/w5BG4b>, Toronto Star <http://bit.ly/FPtJiJ>, Winnipeg Free Press <http://bit.ly/FQ0kUE>, Penticton Herald <http://bit.ly/GB8rf0> and Metro News <http://bit.ly/xfynxv>.

Daily Commercial News reported on crash tests conducted by Ryerson researchers. <http://bit.ly/H0oSAe>

blogTO reported on the StartMeUp Ryerson Slight business plan competition. <http://bit.ly/H6thzT>

CBC Radio reported on a multimedia campaign on bullying by digital media students, quoting professors **Laurie Petrou** and **Richard Lachman**.

NOW profiled alumna and dietician **Lilisha Burns**, Food and Nutrition. <http://bit.ly/GZU3Nc>  
NOW also profiled the public health and safety program at Ryerson. <http://bit.ly/Hm24ee>

The Council of Ontario Universities reported on research pertaining to cystic fibrosis by **Russel Viirre**, a story pitched by Public Affairs <http://bit.ly/GXPZMk>. Similar articles also appeared in Medical Xpress <http://bit.ly/GWwHm2> and News Medical <http://bit.ly/GT9Poz>.

Yahoo! Sports profiled Rams hockey coach **Graham Wise**. <http://yhoo.it/HgIH7c>

**Patrice Dutil**, Politics, appeared on CBC's *The National* and took calls from CBC Radio listeners in Ottawa on the topic of the Ontario budget. He also appeared on TFO's *Relief* and RDI's *Le Telejournal*.

**Myer Siemiatycki**, Politics, spoke to Sun-TV about the NDP leadership. Listen here: <http://bit.ly/H08miv>. He was also quoted in the National Post about an audit of Mississauga council. <http://natpo.st/zuhhLe>

**Howard Muchnick**, TRSM, was quoted in a Toronto Star article about the TTC naming its customer liaison panel <http://bit.ly/H9kn1p>.

**Emily van der Meulen**, Criminal Justice and Criminology, was quoted in a Toronto Star article about a red light district in Toronto. <http://bit.ly/GTBmFi>

The Globe and Mail profiled the "StartMeUp Ryerson" business plan competition. <http://bit.ly/GUxO9e>

A Business2Community.com article on audible name tags profiled Ryerson research on diversity. <http://bit.ly/GRvKwM>

A National Post article on the University of the West Indies Benefit and Right to Play Gala profiled Chancellor **G. Raymond Chang**. <http://bit.ly/GPcC6C>

**Peter Vronsky**, History, published a piece in the Toronto Star on Canada's forgotten casualties. <http://bit.ly/H15b6w>

iNews 880AM quoted **Grace-Edward Galabuzi**, Politics, on the topic of supremacy rallies. <http://bit.ly/GYA7W2> He also appeared on radio stations across the country discussing racism and poverty, including London, Edmonton, Vancouver and Calgary. The Edmonton Journal profiled his lecture Race and the Canadian Project in the 21st Century <http://bit.ly/GG4Wht>.

**Murtaza Haider**, TRSM, appeared on radio outlets in Saint John and Moncton regarding Saint John's master plan.

CP24 reported on the Help Hunger Disappear campaign at Ryerson University.

The Toronto Star profiled Ryerson's online Food Security certificate program; quoting program coordinator **Reg Noble**. <http://bit.ly/GP3dJ9>

CTV Morning Live (Ottawa) mentioned the Ryerson Quidditch team.

The Globe and Mail quoted **Mustafa Koc** in an article about ethnic communities struggling to match diet advice with cultural dishes. <http://bit.ly/GKBokH>

The Toronto Star profiled the Ryerson Career Centre, quoting **Philip Lim**, director and student **Jovan Filipovic**. <http://bit.ly/GFwxmx>

Akimbo interviewed META 2012 curatorial team member **Jordanne Pavao**. <http://bit.ly/GCMru3>

**Tim Sly**, Occupational and Public Health, spoke to CBC News, CBC Radio's Here and Now and Metro Morning about a beef recall.

The Canadian Press reported that the 2012 Ontario Newspaper Awards nominations included **Katia Dmitrieva**, as student journalist of the year. The article was picked up by the Hamilton Spectator <http://bit.ly/FQMaDu>

CFJR-FM (Brockville) profiled alumna **Trudy Breckenridge** and the Ryerson dietician program.

Yahoo! Music profiled the SMART lab and the Emoti-Chair, a story pitched by Public Affairs. <http://yhoo.it/zls15l>

**Jacqui Gingras**, Nutrition, was quoted in a Calgary Herald article on the Alberta Milk nutrition seminars <http://bit.ly/FQPh08>. The article also appeared in the Edmonton Journal.

OMNI News: South Asian Edition spoke to **Sandeep Agrawal**, Urban and Regional Planning, about his study on the South Asian community. The segment also aired in Calgary and Vancouver.



Canadian Press profiled the "Marketing vs. The Market" panel discussion hosted by the School of Fashion, quoting professor **Brynn Winegard**. The discussion was also reported by CTV.CA <http://bit.ly/wPUhSC>, Winnipeg Free Press <http://bit.ly/GBR38g>, Trail Daily Times, Huffington Post Canada <http://huff.to/GC7NaT> and the Telegram <http://bit.ly/GC1gPp>. The story was pitched by Public Affairs.

CBC.CA profiled Fashion alumni **Joeffer Caoc** and **David Dixon** in a piece on Toronto Fashion Week. <http://bit.ly/FOf1vI>

CBS News profiled Theatre alumnus **Eric McCormack**. <http://bit.ly/w0EMvE>

RDI featured **Joseph Nasr**, Centre for Studies in Food Security, in a segment on urban agriculture.

The Toronto Sun profiled a study by Ryerson students on builders embracing the Energy Star standard.

Caledon Enterprise profiled the work of Ryerson urban and regional planning students. <http://bit.ly/zgZyXM>

IT World Canada profiled the Mainframe Education program at Ryerson in an interview with instructor **Horace Dyke**, facilitated by Public Affairs. <http://bit.ly/yUmZqk>

Daily Commercial News reported that Ryerson won the concrete toboggan race in Calgary. <http://bit.ly/yAH1ON>

CBC National and CBC News Toronto profiled Fashion alumna **Cara Cheung** in a segment about Mastercard Fashion Week.

The Ottawa Sun profiled the social work program at Ryerson as "a school known for shaping the social work agenda across the country." <http://bit.ly/HJRlPH>

Business Insider made mention of internship programs at Ryerson. <http://read.bi/wzNhcm>

The Toronto Star profiled a Ryerson conference marking the 30<sup>th</sup> anniversary of the Charter, quoting **Ivor Shapiro**, Journalism. <http://bit.ly/AhK6gW>

A Vancouver Sun story on health hazards for immigrants quoted **Morton Beiser**, Psychology <http://bit.ly/xUWliZ>. A similar article appeared in the Leader-Post <http://bit.ly/wDhRer>.

An Edmonton Journal story on women's hockey quoted Ryerson head coach **Lisa Jordan**. <http://bit.ly/wyWVwz>

The National Post profiled Ryerson development at Yonge and Dundas, also profiling **David Amborski**, Urban and Regional Planning <http://bit.ly/GVfoTj>. He also spoke to CFX (Victoria) about the municipal budget.



**Colleen Carney**, Psychology, appeared on several broadcast media discussing sleep deprivation and Daylight Savings Time, a story pitched by Public Affairs. She spoke to 680 News, CTV News, Citytv News and CBC Radio's Here and Now.

**Maurice Mazerolle**, TRSM, spoke to the Chronicle Herald about lasting effects of the Halifax transit strike. <http://bit.ly/yu1oeo>

**Mitchell Kosny** spoke to the Toronto Star and Metro News about a conflict of interest case that could oust Mayor Rob Ford: <http://bit.ly/xsi7AJ> and <http://bit.ly/ztlDN6>.

*Prepared by Marketing and Communications*

Ryerson University

# Report of the Senate Learning and Teaching Committee

May, 2012

# Report of the Senate Learning and Teaching Committee

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## Introduction

The goal of the Senate Learning and Teaching Committee (SLT) is the promotion of an effective educational environment by identifying, prioritizing, and acting upon issues from across the University. Much of the committee work is conducted within subcommittees comprised of a cross-section of the Ryerson community, and through the sharing of outcomes with the larger SLT group. The SLT also maintains a close and synergistic relationship with Ryerson's Learning and Teaching Office (LTO) to help it meet SLT goals.

This document provides a report of subcommittee activities for the academic year 2010-2011. In addition, the SLT Committee has identified pressing issues to be addressed.

### **Members of the Senate Learning and Teaching committee 2011 – 2012:**

#### **Chris Evans, Vice Provost, Academic (Chair)**

Heather Lane Vetere - Vice Provost, Students  
 Maureen Reed –Director, Learning & Teaching Office (non-voting)  
 Diane Schulman - Secretary of Senate (non-voting)

#### **Appointees of the Vice Provost, Academic**

Donna Bell – Academic Integrity Officer  
 Katherine Penny – Director, Experiential Learning Office  
 Rona Abramovitch – Advisor on Outreach and Access  
 Anne Johnson – Faculty, Chemistry and Biology  
 Lori Beckstead – Faculty, Radio and Television Arts  
 Jasna Schwind– Faculty, Nursing  
 Beth Swart– Faculty, Nursing

#### **Appointees of the Vice Provost, Students**

Christina Halliday - Director, Student Learning Support  
 Gretchen Bingham - Coordinator, Learning Success Centre  
 Boza Tasic - Coordinator, Math Assistance Centre

#### **Learning & Teaching Office**

Restiani Andriati, Digital Media Projects Office  
 Paola Borin, Curriculum Development Consultant  
 John Paul Foxe, Educational Developer  
 Dalia Hanna, Program Coordinator  
 Linda Kowal, The G. Raymond Chang School of Continuing Education  
 Michelle Schwartz, Research Associate  
 Gosha Zywno, Faculty Associate, UTDP  
 Amira Rezkalla, Administrative Assistant

#### **Faculty Representation**

Robert Teigrob - Arts, History (Teaching Chair)  
 Marsha Barber - Communication & Design, Journalism (Teaching Chair)  
 Elaine Frankel - Community Services, Early Childhood Education (Teaching Chair)  
 Frankie Stewart - Engineering, Mechanical Engineering (Teaching Chair)  
 Tatyana Antimirova - Architecture & Science, Physics (Teaching Chair)  
 Ken Grant - Ted Rogers School of Management, ITM (Teaching Chair)  
 Don Kinder - Librarian, Library (Teaching Chair)

#### **Students**

Monica de Vries - Arts, Public Administration  
 Rebecca Zanussi - Communication & Design, Journalism

Neda Hamzavi - Community Services, Nursing  
Yeganeh Ghezavati - Engineering, Architecture & Science, Industrial Engineering  
Rachel Velsher - Ted Rogers School of Management, Business Management  
Golam Morshed - Graduate Studies, Mechanical Engineering  
Ugochukwu Asagwara - Continuing Education

## 1.0 Senate Learning and Teaching Subcommittee Reports

### Preamble

In an August meeting, the Chair requested all subcommittees to submit their action plans for the 2011/2012 academic year. These action plans included their goals and potential deliverables. Each month, subcommittees reported on their progress. They submitted reports on their outcomes in early April. What follows is a summary of these reports.

### Academic Integrity Subcommittee

#### Committee members 2011-2012

Donna Bell (Chair)	Academic Integrity Office
Diane Schulman	Secretary of Senate
John Paul Foxe	Learning & Teaching Office
Anne Johnson	Faculty member, FEAS
Restiani Andriati	Digital Media Projects Office
Don Kinder	Library
Linda Kowal	The G. Raymond Change School of Continuing Education
Leland Harper	Graduate Student, Philosophy

#### Background

The Academic Integrity Subcommittee was formed in 2004. This committee addresses issues of concern to faculty surrounding student academic conduct and methods to reduce academic misconduct. In addition, this committee focuses on creating resources for faculty to assist with the reduction of academic misconduct on campus.

#### Goals 2011-2012

1. Develop a guide for international students to assist in their understanding of academic integrity standards at Ryerson.
  - committee will conduct research to understand international student's unique needs
  - work with International Student Services to reach these students (listserv, orientations etc...)
2. Develop recommendations/best practices for student collaboration in study groups from an academic integrity perspective.
  - create a student AI newsletter with tips

#### Outcomes

1. The committee conducted an extensive literature review and synthesized outcomes in order to understand academic integrity as it relates to international students. In addition, the committee met with International Student Services at Ryerson to better understand the needs of Ryerson students around issues of academic integrity. A focus group of international students was

conducted and these students further elaborated on issues from the literature and from International Student Services. Based on these outcomes, a brochure was developed which will be available to international students by June. This brochure focuses on Canadian Academic Culture and is intended to alert students to issues of integrity and academic expectations. Finally, the committee recommended that the Academic Integrity Office be involved in orientation in August and September for international students. The Academic Integrity Office will follow this recommendation.

2. Based on best practices research in student collaboration in study groups, the first issue of the student Academic Integrity Newsletter will be released in April and is intended to assist students taking courses in the spring/summer term. This newsletter will also be available on the Academic Integrity website. Further, a faculty newsletter will be developed for release in August. This newsletter will be entitled 'Student Assessment in a Connected World' and will emphasize tips for instructors, with a focus on the collaborative world students live in today.
3. A poster campaign was developed with the slogan 'Think or ask before you share.' The poster is intended to help students understand what is acceptable when collaborating with other students. In addition, an email address will be available for students who have questions about collaboration. The email address will be: [askbeforeyoushare@ryerson.ca](mailto:askbeforeyoushare@ryerson.ca).

### **Future Directions**

1. The committee plans to examine assessment (including peer evaluation) in group work and provide recommendations (best practices) to faculty.
  - conduct research to see what material already exists
  - develop best practices for assignment design for group work/projects
2. Continue to work with international students and increase interactions between International Student Services and the Academic Integrity Office.

## **Experiential Learning Model Subcommittee**

### **Committee Members 2011 - 2012**

Gretchen Bingham	Learning Success Centre
Paola Borin	Learning and Teaching Office
Elaine Frankel	Faculty of Community Services
Andrew McWilliams	Faculty of Engineering, Architecture & Science
Gillian Mothersill	Faculty of Communication & Design
Katherine Penny (Chair)	Experiential Learning Office
Jasna Schwind	Faculty of Community Services
Monica de Vries	Student
Reena Tandon	Faculty of Arts

### **Background**

The Experiential Learning Model Committee's mandate is to model and disseminate best practices in experiential learning across the university.

The subcommittee has created a comprehensive *experiential learning model* designed specifically with Ryerson University's teaching and learning community in mind. When creating the model, consideration was given to how application, analysis, evaluation and creativity in experiential learning allows for transformational intellectual growth. A great deal of attention was paid to building an interactive model that would maximize effective learning.

The model was fine-tuned following a presentation to the Senate Learning and Teaching Committee in January 2010. It was accepted through a peer-review process for presentation at the STLHE 2010 conference in June 2010 and was very well received. The model was made available on the experiential learning website and to the teaching chairs. It was also featured at the Ryerson Faculty Conference 2011 in the session "Focusing on the Lenses of an Experiential Learning Model".

Throughout 2010-2011, a video, which included an enhanced graphic of the model and supporting materials, was developed and produced by members of the subcommittee and the Office of Digital Media Projects. It is meant to be used as an effective means of delivering the model across the university and a useful and interactive resource for faculty and staff.

#### **Goals for 2011-2012**

1. Distribute the video, along with supporting information, to programs and departments at Ryerson.
2. Conduct an interactive session with the Senate Learning and Teaching Committee, including Teaching Chairs, using the experiential learning model video.
3. Promote the video as an interactive tool for use by deans, directors/chairs, teaching chairs and managers.
4. Make the video available on the Experiential Learning Office website [www.ryerson.ca/experiential](http://www.ryerson.ca/experiential). Provide links to assist faculty and staff to further understand how the lenses of the model are defined and how they support experiential learning activities within the curriculum.
5. Present the video at the Ryerson Faculty Conference 2012, and other external conferences that are deemed appropriate.
6. Collect faculty-specific frameworks and instances for initial exploration of Ryerson-specific recommended strategies to promote critical reflection. (Note: The work on critical reflection flows from the Experiential Learning Model. The Experiential Learning Model Subcommittee will be the Critical Reflection Subcommittee as of February, 2012.)

#### **Outcomes**

1. An experiential learning video package was distributed to seventy-five deans, chairs, directors, managers and senior managers with a follow-up survey to measure the usage of the video. The data is currently being analyzed.
2. Successful interactive sessions about the use of the video and accompanying materials were held. These sessions were intended to help faculty and staff understand the EL model and its application.
3. A short version of the video was created for promotional purposes.
4. The video was marketed in several ways. First, the short version of the video became available on Ryerson Today and is also available at [www.ryerson.ca/experiential](http://www.ryerson.ca/experiential). The longer version of the video is linked to groups such as the LTO.

5. Materials to assist in the understanding of the video were designed, including materials on how to use the video and materials providing interactive questions about experiential learning and the model. Supporting materials for the video were also made available on the Experiential Learning Office website at <http://www.ryerson.ca/experiential>.
6. The model and video were presented at several external conferences, including the International Technology Education and Development Conference 2012 and the International Circle Conference of Educational Institutes for Graphic Arts: Technology and Management 2012. An abstract has been submitted for the Ryerson Faculty Conference 2012.
7. The Critical Reflection Subcommittee has compiled a document to support critical reflection that includes references to models, scholarship, and resources and tools. It will be distributed to the Senate Learning and Teaching Committee and is available on the Experiential Learning Office website at <http://www.ryerson.ca/experiential>.

### **Future Directions**

1. The Experiential Learning Model group will continue on-campus and external promotion and support of the video and model.
2. The Critical Reflection Subcommittee will explore various aspects of critical reflection with the ultimate aim of providing a suite of resources useful to the Ryerson community. This will include exploring broadly applicable models, and those that may be more relevant for specific faculties.
3. The subcommittee will work to create an understanding of reflective practice as a teaching tool and share best practices with the Ryerson community.

## **Inclusive Learning Environment**

### **Committee Members 2011-2012**

Gretchen Bingham (Chair)	Learning Success Coordinator
Rona Abramovitch	Access and Outreach
Dalia Hanna	Learning and Teaching Office
Heather Willis	Accessibility Coordinator
Rodney Diverlus	VP Equity RSU
Gilary Massa	RSU Equity events organizer
Elaine Frankel	ECE, Teaching Chair FCS
Katherine Turner	ISTC

### **Background**

The subcommittee began meeting in 2007 to explore ways in which the Ryerson community could better respond to learning with an inclusive lens. The initial questions posed were: *What is inclusive education and how do we create inclusive learning environments?*

Through a series of discussions with subcommittee members and faculty, it was decided that a simulation experience would be developed in collaboration with the Interpersonal Skills Teaching Centre (ISTC). Over a period of two years, the subcommittee worked with Katherine Turner from the ISTC, collected stories, developed scenarios and had rich discussions around the issues of inclusive education at Ryerson.



The purpose of the resulting simulation is to increase awareness of inclusivity in the classroom based on real stories and critical incidents contributed by students, staff and faculty.

A pilot of the simulation was presented in February, 2009 to members of the Senate Learning & Teaching Committee, with the intent of using the feedback from participants to further refine the simulation. Since that time, the simulation has been delivered and revised several times.

### Goals for 2011 – 2012

1. Based on feedback from participants, further refine and present our first simulation on mental health; develop a second character.
2. Inventory a menu of developed characters that can be combined in customized thematic simulations as needed; create an action plan for video production using characters that have already been developed and used in simulations.
3. Through the Learning and Teaching Office, promote principles and awareness of inclusivity through the development of videos, workshops, and online resources.
4. Investigate curriculum experts that can be recommended to present a day-long seminar on universal design for faculty

### Outcomes

1. Feedback suggested that, while well received, simulations need both a facilitator and content expert in the room in order to best respond to participant interactions.
2. A review of past inventories was created in order to better understand the future direction for simulations.
3. Universal design was identified as an issue of concern in the classroom. Committee members researched best practices and identified key individuals in North America who may be called on as speakers. One speaker from Guelph was contacted about the possibility of giving a workshop in the future.

### Future Directions

1. This committee will become part of other SLT committees or working groups.

## Information Literacy

### Committee Members 2011-2012

Don Kinder (Chair)	Library
Michelle Schwartz	Learning and Teaching Office
John Paul Foxe	Learning and Teaching Office
Beth Swart	Faculty of Community Services, Nursing
Paula Borin (Advisor)	Curriculum Development Office
John Hannah	Learning Success
Courtney Lundrigan	Library

Note: Members of the Library's Learning and Teaching Committee were involved in certain of these initiatives.

### Background

The Association of Colleges and Research Libraries/ACRL (2006) defines an information literate individual as one who is "able to recognize when information is needed and has the ability to locate,

evaluate and use effectively the needed information and to use it ethically and legally.” It is widely recognized that information competencies are key factors in student success and in lifelong learning, and the *Information Literacy Competency Standards* developed by the ACRL have been adopted by numerous postsecondary libraries internationally.

The mandate of this subcommittee is to create a culture of information literacy at Ryerson. By identifying instructors who are already embedding information literacy skills into programs and courses, the subcommittee aims to create an inventory of best practices. This information will then be used to develop programs and tools that will empower instructors to incorporate information competencies into their courses, both by working collaboratively with librarians and by drawing on the expertise of their peers.

### Goals for 2011-2012

1. **Curriculum Mapping.** Develop a process/template for mapping the ACRL's Information Literacy Standards for Higher Education to the guidelines of the Degree-Level Expectations (DLEs). DLEs require a consideration of the outcomes and structure of a program and hence provide an opportunity to examine how research and information literacy outcomes can be embedded into courses. Using data from the Information Literacy Survey for Faculty conducted by this committee in 2010/11, we plan to identify faculty partners willing to work with the committee on this project. Paola Borin (Curriculum Development Consultant) will advise.
2. **Workshop: Integrating Information Literacy into the Curriculum.** The purpose of this workshop is to provide faculty with a toolkit to facilitate academic success in their courses by assisting students in developing the competencies needed to understand the nature of information, access it effectively, evaluate it critically, and incorporate it into their knowledge base. This workshop will also be adapted and presented to TA/GAs.
3. **Workshop: Assignment Design—Best Practices.** This discussion-based workshop will focus on the ways that good assignment design can guide students to develop valued research skills, engage critically with source materials, and avoid common pitfalls such as plagiarism.

### Outcomes

1. Currently the committee is consulting with the university curriculum developer to map DLEs to the ACRL's information literacy standards and apply these standards to Ryerson. Members of the subcommittee also participated in an Ontario-wide quality assurance event. Finally, members of the subcommittee are designing and planning sessions that could be taken to departments and individuals on mapping DLEs within information literacy standards during program renewal events.
2. The committee offered a workshop for faculty on integrating information literacy into their curriculum. The committee also offered three sessions on fostering information literacy as part of the LTO's Ryerson Graduate Professional Teaching Development Program.
3. The Assignment Design-Best Practices workshop was offered at the May 2011 faculty conference and also given to some faculty level teaching committees.
4. Two workshops for faculty on the journal publishing, impact factors and institutional repositories were offered in the fall and winter terms.

5. Three workshops for faculty on copyright in research and teaching were offered in Winter 2012.
6. Committee members developed an online research skills tutorial for the History Department as part of a pilot project designed to foster information literacy skills in courses and programs. The web-based learning object (called "RE:search") contains interactive modules that focus on building effective research questions, identifying appropriate sources, creating effective search strategies and evaluating and integrating sources. Committee members are working to enlist other departments and programs in developing tutorials tailored to their courses.

### **Future Directions**

This committee will be folded into the Library's Learning and Teaching Committee (associated with the Teaching Chairs) as the two committees have overlapping mandates and membership

## **Writing & English Language Proficiency Working Group**

### **Committee Members 2011-2012**

Christina Halliday (Chair)	Student Learning Support
John Hannah	Student Learning Support
Chris Brierly	English Language Proficiency
Marju Toomsalu	English Department
Anne Johnson	Faculty Member, FEAS
Beth Swart	Faculty Member, FCS
Donna Bell	Academic Integrity Office
Michelle Schwartz	LTO
John Paul Foxe	LTO

### **Background**

The Writing & English Language Proficiency Working Group is responsible for identifying student academic writing and English language skill development needs and, in response to those identified needs, making recommendations regarding faculty and teaching assistant development, program development across campus, and academic policies. Where concerns are relevant to specific faculties, units, or other campus initiatives, the Chair of the subcommittee will liaise as appropriate.

### **Goals for 2011-2012**

1. Participate in the development of "Supporting EAL Learners" resources for the LTO website
2. Submit a proposal to the Ryerson University Faculty Conference, May 2012
3. Create an online resource on the LTO website which includes:
  - 1) best practices in writing/English language diagnostics and remediation;
  - 2) resources on how to guide students in remediation and
  - 3) an online advising tool or module that instructors can direct students to.

### **Outcomes**

1. A draft of developed resources is currently being vetted for feedback. This should be completed by May or June 2012.
2. A proposal was submitted for the May 2012 faculty conference.

3. Information on student performance was gathered and evaluated. In addition, the committee worked with FEAS and FCS on written assessments and these data, along with data gathered from TRSM, will assist in the development of resources. The committee is working on developing best practices for post-admissions writing diagnostics to be housed on the LTO website.

### **Future Directions**

Based on these outcomes, resources will be developed to assist faculty in understanding and working with their students who have English as an additional language. These resources will be housed and highlighted on the LTO website.

## **Effective Use of Technology**

### **Committee Members 2011-2012**

Restiani Andriati	(Chair) DMP, CCS
Tetyana Antimirova	Teaching Chair, FEAS
Ken Grant	Teaching Chair, TRSM
Sally Wilson	Library
Dalia Hanna	Learning and Teaching Office
Graham McCarthy	Library
Michelle Schwartz	Learning and Teaching Office
Stephanie Goetz	DMP

### **Goals for 2011-2012**

1. Web 2.0/Social Media Workshops
 

There are various Web 2.0/Social Media tools, such as blogging, microblogging (Twitter), online videos, podcasting, YouTube, and wiki/Google Docs. The committee will decide on tools to be offered this year. Each of the tools will be presented in two types of workshops:

  - Introduction to the specific tool and how to get started
  - Classroom implementation: How to use the tool in class - this includes: how it aligns with course objectives, course/assignment design using the tool, class participation, grading. A faculty member will be invited to share their experiences using the specific tool in her/his teaching - this includes: what works/doesn't work, student reception.
2. Along with the workshops, online resources will be compiled for each tool:
  - Best practices for use in class (at Ryerson, at other universities, and in research findings)
  - Guidelines for incorporating Web 2.0 tools in a course (e.g. student privacy, opt-out options, etc.)

### **Outcomes**

1. Held four Web 2.0 workshops aimed at an intermediate level (participants had some previous knowledge or experience with Web 2.0). These had successful outcomes and were well rated by participants and will be continued next year.
2. Faculty have participated in workshops, speaking about the use of these tools in their own classrooms. Best practices in using these tools are posted on the Web 2.0 blog.
3. Working with the university privacy commissioner on guidelines for privacy in using Web 2.0

**Future Directions**

1. Present a Blackboard workshop entitled 'Engaging Students in Blackboard' that includes instructional design at the Faculty Conference 2012.
2. Create some workshops around online and Web 2.0 tools that address specific topics including instructional strategies that work well for 1) communication, 2) assessment, and 3) content. In addition, feedback will be solicited from faculty on how they would like to use online and Web 2.0 tools within their classes.
3. Create a Blackboard resource site to be housed at or integrated with the LTO website.
4. Create a workshop for a small group of faculty members on 'How to Design your Course in Blackboard.' The goals of this session would be to give participants the basics for course design using Blackboard, and to have the first few weeks of materials posted before the first day of class.
- 5.

## 2.0 Identified Discussion Issues and Future Actions

**Preamble**

At each Senate Learning and Teaching Committee meeting time was devoted to discuss issues of importance in the Ryerson community. Of the topics discussed, three in particular generated a great deal of interest. These topics are listed below along with a brief discussion summary. In addition, members suggested future actions for the SLT to address these issues.

**Discussion Topics****Topic 1: Faculty Student Interaction***Summary*

Engaging students inside and outside of the classroom is an important part of student success. Students who feel engaged often report feeling better integrated into their environment and research shows that this integration effects academic success. SLT members recognized that improving student faculty interactions is one approach to improving student engagement. However, improving this interaction requires a multipronged approach. Members felt it was important for faculty to reach out to students early in their academic careers, that physical spaces that are shared by students and faculty be promoted, and that student faculty interactions could be facilitated through curriculum changes (e.g. course design that requires individual interactions between a student and faculty member).

**Topic 2: Teaching Controversial Topics***Summary*

Many faculty members must teach topics within their class that are considered controversial. How faculty members introduce and monitor controversial topics will ultimately determine the level of learning within the classroom. However, faculty often wonder what the best practices are in leading these discussions. Members of SLT agreed that identifying and discussing controversial topics is important and SLT recommended that best practice guidelines be developed to assist faculty in dealing with controversial topics. A second aspect of this discussion focused on dealing with students who make inappropriate comments in class that are demeaning to others. Recommendations included creating a class contract providing rules for discussions, reminding students of their responsibilities regarding conduct, addressing the

comment immediately in a professional way, speaking to the offending student after class, challenging the offending student to rephrase the comment, and monitoring class discussion boards in order to ensure respectful conduct of all students.

### **Topic 3: Ways in which Student Services Can Assist Classroom Teaching**

#### *Summary*

The Vice Provost, Students presented services to SLT that might be of assistance to faculty. These included English Language Support, the Writing Centre, and other academic support programs such as FAST start. The VP Students noted that they have been presenting their programs to faculty through departments and the faculty conference.

#### **Future Directions**

Members believe that there are several ways to address each of the topics above. Based on these discussions the following actions were taken or are planned:

1. Faculty-Student Interaction: Members agree that university retention strategies should include an examination of the methods to increase faculty-student interaction. Currently, the Vice-Provost Academic, with the assistance of the LTO, is reviewing literature and successful practices in encouraging both student and faculty engagement with their institutions. These successful practices will help to guide recommendations for methods that could encourage interaction.
2. Teaching Controversial Topics: The LTO is increasing online resources to assist faculty in presenting material that can be controversial. In addition, the LTO is consulting with individual faculty who have had concerns in teaching such controversy. Finally, methods of inclusion will continue to be considered in all LTO workshops, New Faculty Orientation and in LTO publications.
3. Ways in Which Student Services Can Assist Classroom Teaching: Members suggest stronger links to the LTO in terms of communicating with faculty. In consultation with Student Services, the LTO could provide links and resources for faculty who are looking for assistance with their students.

#### **Recommendation for 2012-2013**

The structure and focus of the SLT have remained unchanged for many years. While the current approach has its merits, the committee Chair, in consultation with members of the SLT, feels that this is a good time to consider ways to renew the SLT committee in its direction and function. This review and renewal will be done with the assistance and advice of Senate.

Respectfully Submitted,



Chris Evans, Vice Provost Academic  
Chair of the Committee

## REPORT OF THE ACADEMIC STANDARDS COMMITTEE

### Report #W2012-4; May, 2012

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

- the *Certificate in Energy Management and Innovation* from the Chang School
- the *Certificate in Advanced Nursing Leadership and Management* from the Chang School
- the *Certificate in Infrastructure Asset Management and Renewal* from the Chang School
- the *Certificate in Robotics and Embedded Systems* from the Chang School
- the *Certificate in Mining Management* from the Chang School
- the *Bachelor of Science degree program in Biomedical Sciences* from the Faculty of Engineering, Architecture and Science (to be offered by the Faculty of Science)
- the *Bachelor of Commerce degree program in Real Estate Management* from the Ted Rogers School of Management

### A. PROPOSAL FOR A CHANG SCHOOL CERTIFICATE IN ENERGY MANAGEMENT AND INNOVATION

**1. The Proposal:** The Centre for Urban Energy of the Faculty of Engineering and Architectural Science in cooperation with the G. Raymond Chang School of Continuing Education, are proposing to offer a Certificate in Urban Energy, entitled *Energy Management and Innovation*.

**2. Rational for the Certificate:** Transforming to a “green” economic model has emerged as one of the many challenges facing society in the 21<sup>st</sup> century. Converting to renewable energy and reducing dependence on fossil fuels is seen as the cornerstone of economic, environmental and industrial sustainability. Renewable energy and the development of the smart grid are regarded as essential to national prosperity, security and maintaining a global competitive advantage. To prepare for, and facilitate this transformation, countries need to invest in developing clean-energy technology and ensure that there is an appropriately trained workforce to lead innovation and drive industry - and vice versa, to lead industry and drive innovation.

Renewable energy and the smart grid are emerging as vital areas of academic and industrial pursuit. Ryerson University and distinguished partners have recently established a Centre for Urban Energy (CUE). It is an institute focused on the discovery, development and commercialization of innovative, practical solutions to urban energy challenges. A great opportunity exists for The Chang School to participate with CUE in developing a program in the field of clean energy management and innovation. The proposed program will provide a distinct and valuable educational option for adult learners.

**3. Certificate Goals:** In the energy sector, for every two people retiring from the workforce, there is only one joining. This is not sustainable, particularly in a sector that is growing rapidly. Complicating the skills

shortage in the energy sector is the “skills disconnect” between skills-training and skills-needs. The next leaders in this sector will require a balanced understanding of the challenges and emerging solutions in energy science, engineering and technology, energy management, conservation, sustainability and policy and in energy innovation and entrepreneurship.

The goals of the certificate are to deliver this foundation of knowledge in energy, management and innovation to its graduates aspiring to become energy experts and the next leaders in the sector.

**4. Target Audience:** The target audience for this program includes: individuals seeking to expand their expertise, change or advance their careers and those seeking professional development leading to management and leadership roles in the energy sector. The market for such individuals is large and includes: established private sector companies (large and small), law firms, energy public sector agencies – Ontario Power Authority (OPA), Independent Electricity System Operator (IESO), Ontario Energy Board (OEB), government ministries – and more than 80 provincial utilities. The market also includes energy entrepreneurs seeking to start their own business in this thriving sector.

**5. Certificate Structure:** The Certificate in Energy Management and Innovation will require the successful completion of six courses, three (3) required, two (2) electives and one (1) Capstone offered through The Chang School:

*Required Courses:* (single term): Energy Innovation and Entrepreneurship\* (39 hours); Fundamentals of Project Management – CKPM202 (39 hours); Renewable Energy and Green Technology – CKES190 (39 hours).

*Elective Courses:* (single term): Select two (2): Energy Efficiency and Demand Response\* (39 hours); Energy and the Public Policy Debate in Canada\* (39 hours); Fundamentals of Sustainability I – CKSS100 (39 hours); An Introduction to Smart Grid\* (39 hours); Environmental Economics – CECN 510 (39 hours).

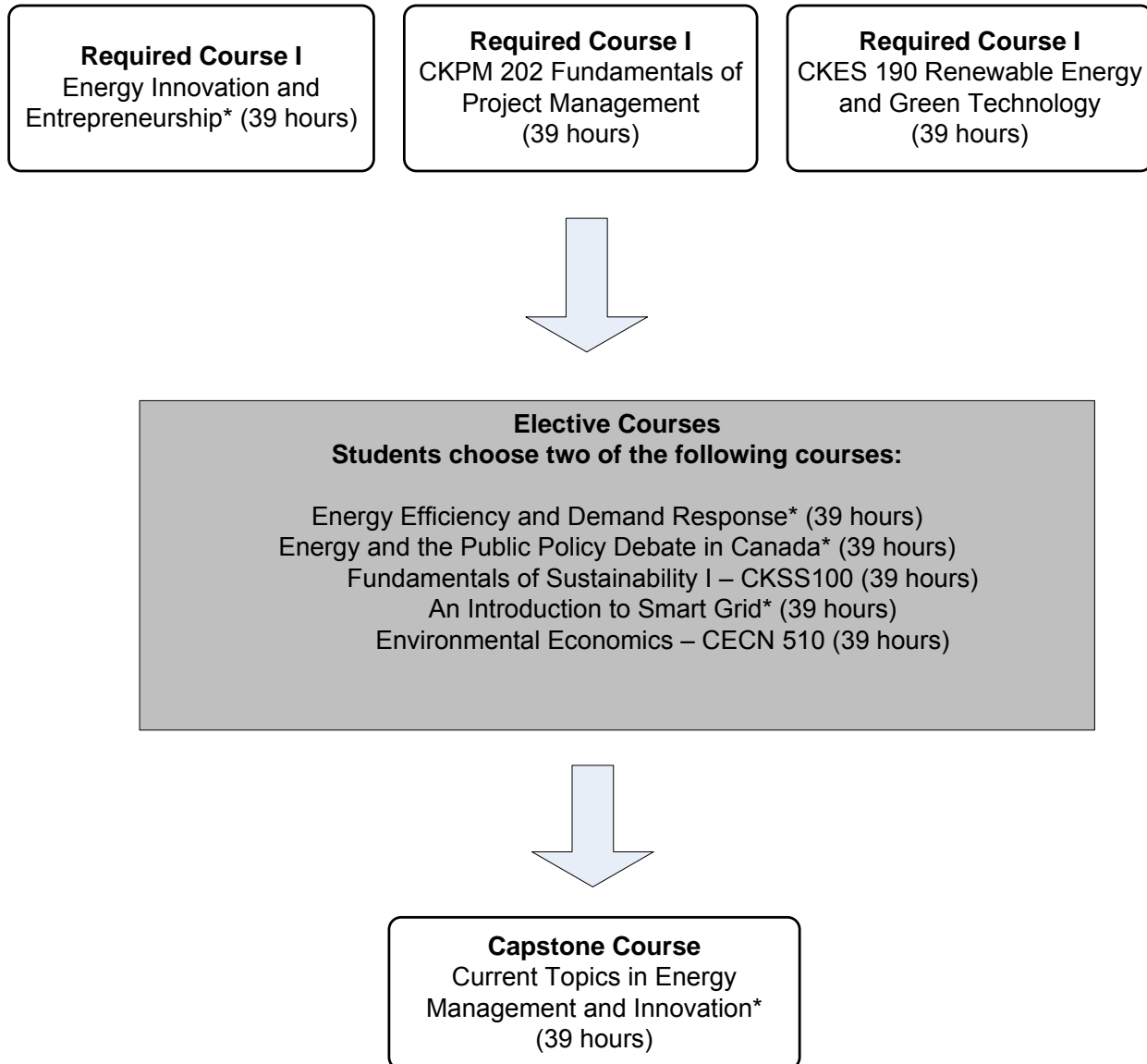
*Capstone:* Current Topics in Energy Management and Innovation\* (1) (39 hours)

\* = New course.

The optimal flow of the curriculum is described in the flowing chart.



### Certificate in Energy Management and Innovation Structure



\*New course

It is recommended that the 5 required courses be taken before the Capstone course although the Capstone course may be taken in conjunction with the fifth course of the Certificate.

**6. Certificate Learning Outcomes:** The learning outcomes from the Certificate in Energy Management and Innovation will include:

- A professional with an in-depth grasp of the technical and non-technical issues that impact energy generation, transmission (transport), distribution and consumption.
- A professional with enriched knowledge of: innovation and innovation literacy, entrepreneurship, project management and innovation management.
- A professional with comparative analytical acuity with respect to renewables.
- A professional with applicable knowledge of regulations and policy aspects of energy.
- A professional with evidence-based evaluation competency in recognizing how many non-technical issues impinge upon energy policy and why certain policy outcomes seem to be decided by these social and political considerations.
- A professional with a sound insight into what it entails to create the smart grid, the challenges ahead and the costs and benefits from it.
- A professional with a mastery of the concepts and constructs of energy, energy use and the implications of energy conversions, energy efficiency and demand response actions.

**7. Development Plan:** The delivery of the program would begin in September 2012 and roll out over the next two years. Of the 9 courses listed above, 5 courses are new and must be developed and 4 courses already exist. Faculty within FEAS and Fellows with the Centre for Urban Energy are in place to prepare these courses.

**8. Societal Need:** Energy is the critical sector for Ontario's economy, environment and society – it is at the centre of the climate change debate, fundamental to human welfare and essential to economic prosperity. Four and a half million smart meters have been deployed in the Province of Ontario – laying the foundation for the renewal of our aging infrastructure and modernizing our electrical grid (the smart grid) to allow intelligent, two-way communication and control and enabling distributed generation and the development and deployment of renewable energy technologies. The Ontario government continues to leverage the province's position as a global leader in energy solutions, focusing on: smart grid (grid automations and advanced metering infrastructure, data management (and data analytics) and electric energy storage including plug-in vehicles. The Certificate in Energy Management and Innovation will prepare our students for professional careers and to assume leadership positions in this growing sector.

**9. Admissions Requirements:** The admissions requirements for this certificate program are mature student status and evidence of relevant college or university level coursework; or equivalent, as determined by the Academic Coordinator. Alternatively, an applicant with mature student status together with relevant industrial or professional experience may be considered by the Academic Coordinator for entry into the Certificate in Energy Management and Innovation.

**10. Academic Home:** The Academic Home for the proposed certificate will be the Office of the Dean of the Faculty of Engineering and Architectural Science with the participation of the Centre for Urban Energy (CUE). CUE will liaise with the Office of the Dean in all matters concerning this certificate. 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, Dr. Bala Venkatesh, Associate Professor in the Department of Electrical and Computer Engineering and Academic Director of CUE.

## Recommendation

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Certificate in Energy Management and Innovation.*

## B. PROPOSAL FOR A CHANG SCHOOL CERTIFICATE IN ADVANCED NURSING LEADERSHIP AND MANAGEMENT

**1. The Proposal:** The Centre for Urban Energy of the Faculty of Engineering and Architectural Science in cooperation with the G. Raymond Chang School of Continuing Education, are proposing to offer a six-course *Certificate in Advanced Nursing Leadership and Management*. This will replace the current eight-course *Certificate in Leadership and Management for Nurses*.

**2. Rationale/Goals for the Certificate:** The proposed Certificate in Advanced Nursing Leadership and Management has been designed specifically to meet the needs of nurses currently employed or aspiring to be employed in leadership and management roles within a health services setting. The proposed certificate program builds on the foundational leadership and management content encompassed by a baccalaureate degree; provides access to courses that will focus on a student's main area of leadership and/or management interest; and provides students with the opportunity to apply newly acquired knowledge to a practical leadership and/or management issue.

**3. Target Audience:** The proposed post baccalaureate certificate program is targeted toward provincially and nationally baccalaureate prepared<sup>1</sup> staff level Registered Nurses<sup>2</sup> as well as those with functional management responsibilities.<sup>3</sup> The target audience also includes Registered Nurses who are working

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<sup>1</sup> In 2010, 35,169 Registered Nurses in Ontario, and 104,105 in Canada, were prepared at the BScN level (CIHI, 2010).

<sup>2</sup> In 2010, of the 205,471 Registered Nurses working in staff positions (direct care and/or community health) throughout Canada, 72,242 were employed at the staff level in Ontario (CIHI, 2010).

<sup>3</sup> In 2010, of the 18,138 Registered Nurses working in management positions throughout Canada, 5,522 were employed in management positions in Ontario (CIHI, 2010).

internationally<sup>4</sup> who have a Canadian BScN or equivalent degree. The certificate is an initiative that may be used to build nursing leadership and management capacity internationally.

**4. Certificate Learning Outcomes:** The learning goals of the new certificate are to:

- develop core leadership and management capabilities for frontline leaders to perform and exercise influence within health care organizations and the health care system;
- apply theory and evidence to typical leadership and management challenges;
- enhance reflective and self-aware leadership skills;
- develop knowledge and skill required to engage others as a leader in an inter-professional health care environment;
- develop collaborative skills to enhance partnerships within health care organizations and government; and to
- develop expertise in planning and leading change and innovation to improve the health care service delivery using a systems approach.

**5. Curriculum:** The 'LEADS in a Caring Environment Framework' (2008) was selected as the conceptual model to underpin the curriculum. The LEADS framework best aligns with the results of an environmental needs scan; had a supporting body of evidence to underpin the model dimensions; was focused on leader and manager development at all levels of the organization; and was future-oriented with a focus on change and innovation that is required to advance the current health care system. This relatively new framework has recently been endorsed by major health services institutions and professional associations across Canada.

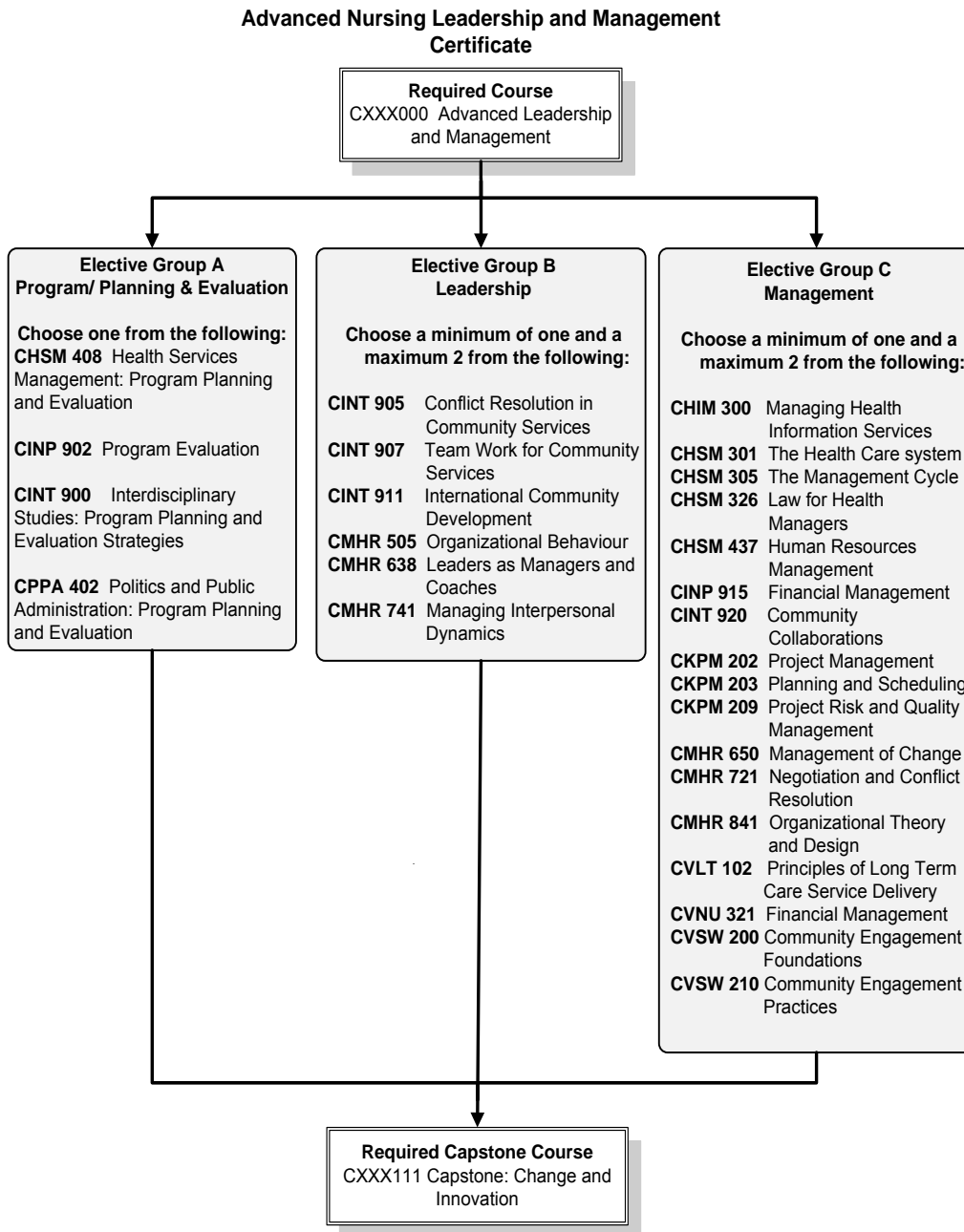
The proposed redesigned certificate consists of six courses. This includes two required nursing courses, one of which is a capstone course; one course elective with a focus on program planning/evaluation (Group A); one to two leadership elective courses (Group B); and one to two management elective courses (Group C). The proposed curriculum, and a comparison to the current *Certificate in Leadership and Management for Nurses*, is presented in the chart on the following page.

**6. Development Plan:** The target implementation date for the proposed certificate is Fall 2012. Upon approval of the certificate, The Chang School, in collaboration with the Daphne Cockwell School of Nursing, will immediately identify faculty member(s) to develop the required nursing course CXXX000 Advanced Leadership and Management. The development of CXXX111 Capstone: Change and Innovation will proceed with a target implementation date of Fall 2013.

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<sup>4</sup> Data on the number of Canadian baccalaureate prepared nurses working outside of the country is not available. However, 2010 data identifies that 6,708 Canadian Registered Nurses are working internationally.

**Proposed Certificate Structure**



It is recommended that students complete CXXX 000 early in their certificate program. Students may take Elective Group A, B and C in any order. The Capstone Course (CXXX111) is the final certificate course. Please refer to the main proposal document for references related to pre-requisites .

The electives have been selected from existing courses offered by other schools/departments in the University in order to leverage the expertise and experience of those schools/departments in attending to specific leadership and management functions as addressed by the LEADS framework. Students will, therefore, have the opportunity to learn with professionals from other disciplines.

**7. Societal Need:** This certificate program is aimed at providing Registered Nurses with the enhanced professional knowledge and skill that will better position them to enact leadership and management roles. According to the Canadian Nurses Association (CNA), “Canadian nurses in all positions must develop and exert leadership. Nursing leadership plays a pivotal role in the immediate lives of nurses and it has an impact on the entire health system and the Canadians it serves” (CNA, 2009, p.2).

**8. Admissions Requirements:** Students registering in the proposed certificate program are Registered Nurses who are registered with the professional governance body of their jurisdiction. They must have a Canadian BScN or equivalent degree. In addition, applicants must complete an application for preapproval and be approved before registering in the course CXXX000 Advanced Leadership and Management.

**9. Academic Home:** The academic home for the proposed Certificate in Advanced Nursing Leadership and Management is the Daphne Cockwell School of Nursing, which will ultimately assume responsibility for the certificate. The academic homes for the individual elective courses will be their schools/departments. The External Advisory Committee of the DCSON will function as the Program Advisory Council for the certificate.

### **Recommendation**

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Certificate in Advanced Nursing Leadership and Management.*

## **C. PROPOSAL FOR A CERTIFICATE IN INFRASTRUCTURE ASSET MANAGEMENT AND RENEWAL FROM THE CHANG SCHOOL**

**1. The Proposal:** The Department of Civil Engineering at Ryerson University in cooperation with The G. Raymond Chang School of Continuing Education proposes to offer a non-degree credit Certificate in Infrastructure Asset Management and Renewal.

**2. Certificate Rationale:** The Canadian governments (municipal, regional, provincial and national levels) have instituted legislation requiring local authorities to create and implement infrastructure asset management plans for the physical infrastructure under their control. This will add to the demand for technologists, infrastructure asset professionals and civil engineers with Infrastructure Asset Management qualifications. The demand for infrastructure management knowledge and skill sets is most significant in large local authorities where demand outstrips supply for specialist infrastructure asset managers.

**3. Certificate Goals:** This certificate is aimed at familiarizing the participants with the basic information, problems and solutions associated with infrastructure asset management, evaluation, preservation and rehabilitation of the existing infrastructures, repair materials and strategies, and risk, fiscal and

management concerns. It will provide a comprehensive knowledge of the fundamental processes and techniques required to establish an effective infrastructure asset management program. In addition, participants will obtain a broad education necessary to understand the impact of civil engineering solutions in a global, societal, and environmental context consistent with the principles of sustainable development.

The goals of this proposed certificate also include educating infrastructure asset professionals to possess the requisite knowledge and competencies to achieve sustainable outcomes by applying holistic, systematic and risk-based processes to decisions concerning the management and renewal of an organization's or a government's physical assets, including infrastructure, fixed plant & mobile equipment.

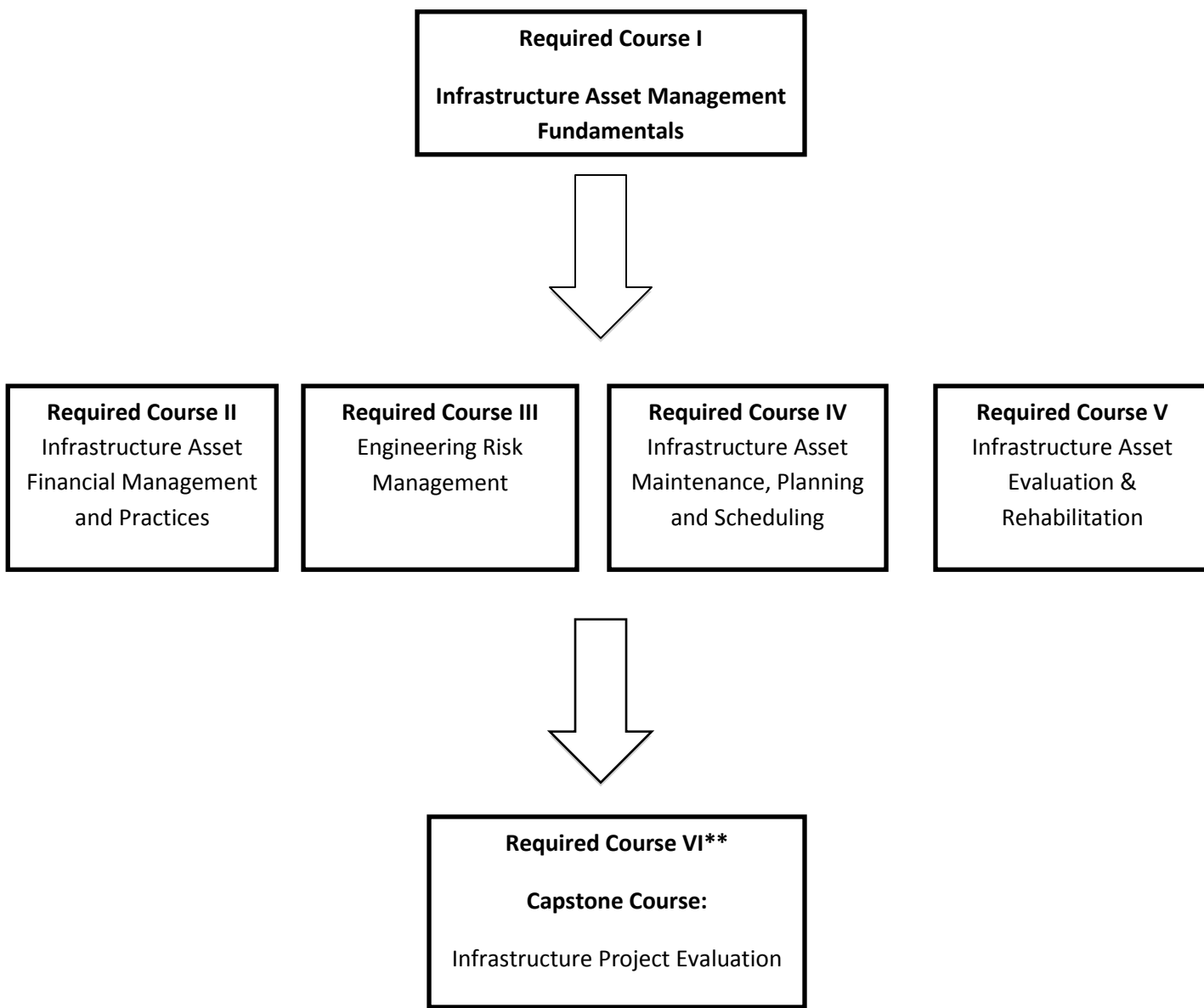
**4. Target Group/Audience:** The Certificate provides a prospective pathway into the infrastructure asset management industry for, in particular, aspiring technologists, 'place bound' infrastructure specialists, contractors and civil engineers who are seeking an opportunity to forge a career by developing current and relevant knowledge – together with a set of valuable competencies and employability skills – to repair, rehabilitate and renew infrastructures such as roads, airports, water systems, levees, tunnels, canals, dams, parks, hospitals, railroads, sewage, solid waste, broadband and public spaces.

#### **5. Certificate Structure/Curriculum:**

The proposed certificate consists of 6 mandatory certificate credit courses, one of which is the Capstone course: Each course is 39-hours in length for a total of 234 hours. The curriculum is described in the chart on the following page.

**6. Development Plan:** Delivery would commence in Fall 2012. Near term development includes the content authorship of the certificate's six certificate credit courses which will be staged for roll-out over Fall 2012, Winter 2013 and Spring/Summer 2013 terms. In order to run the program, an investment every academic year of approximately \$15K will be required to rent appropriate and related equipment, purchase materials, and acquire infrastructure management software and multi-user licensing to educate participants.

**7. Societal Need:** Pressing concerns to rehabilitate and renew deteriorating infrastructure assets are at present drawing the attention of professionals and various levels of government. The need is acute to accommodate, with lean public works budgets, an increasing population in "old" ageing and deteriorating buildings, tunnels, water towers, bridges and public transit systems, and an ever growing traffic intensity on naturally deteriorating and inadequate bridges and roads. In response, infrastructure asset management and renewal (IAM&R) is an emerging inter-disciplinary field that combines the technical issues of infrastructure asset reliability, safety and performance with managerial skills. The correct knowledge and information about inventories, condition, and performance of infrastructure assets, acquired through effective management of the physical infrastructure, can support organizations and governments (federal, provincial or territorial, municipal) in order to ensure public safety, health, security, mobility of people and goods and to assess progress towards achieving sustainable communities.



\*It is recommended that the Required Course I Infrastructure Asset Management Fundamentals be taken first.

\*\*It is recommended that the required courses be taken before the Capstone course although the Capstone Course may be taken in conjunction with the fifth course of the certificate.

**8. Admissions:** The admissions requirements for this certificate program are one of the following sets of requirements depending on the status of the student:

1. Mature student status AND evidence of relevant college or university level coursework (or academic equivalent), as determined by the Academic Coordinator:  
OR



2. Mature student status AND relevant industry or professional experience, as determined by the Academic Coordinator.  
OR
3. Student who has completed the OSSD with six Grade 12 credits or equivalent AND who has relevant college or university level coursework (or academic equivalent), as determined by the Academic Coordinator;  
OR
4. Student who has completed the OSSD with six Grade 12 credits or equivalent AND who has relevant industry or professional experience, as determined by the Academic Coordinator.

**9. Academic Home:** The certificate's Academic Home will be the Department of Civil Engineering. The normal procedures and prescriptions mandated by Policy #76 will apply to the academic and administrative oversight of this certificate offering.

### **Recommendation**

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Chang School Certificate in Infrastructure Asset Management and Renewal.*

## **D. PROPOSAL FOR A CHANG SCHOOL CERTIFICATE IN ROBOTICS AND EMBEDDED SYSTEMS**

**1. The Proposal:** The Faculty of Engineering and Architectural Science, in collaboration with The G. Raymond, Chang School of Continuing Education proposes a six-course Certificate in Robotics and Embedded Systems.

**2. Certificate Goal:** The goal of the proposed Certificate is to provide a pathway into the Robotics and Embedded Systems industry, including the applied technologies and sciences fields. There is an identified and soaring demand for computer/product technologists, but there is a modicum of avenues for professional development and continuing adult education for the applied technology sector writ large.

**3. Target Audience:** The target audience comprises aspiring computer/product technologists who are seeking an opportunity to enter and gain experience working with hardware- and software-related robotics and embedded systems design and development.

Candidates undertaking this certificate are principally programmers, technologists, hardware/software programmers and technologists, communications and networking professionals, control systems technologists, C programming software specialists and other technical professionals involved with or having an interest in Robotics and Embedded Systems design and development.

**4. Certificate Learning Outcomes:** The key learning outcomes of this certificate are for certificate graduands to have the capacity, competencies and leadership expertise to respond effectively to our collective societal need to:

- Provide innovation and advances in robotics and embedded systems product and device development, ranging from microprocessor-based control systems, to systems-on-chip (SoC) design, and to device software development for the purposes of consumer and commercial product development, green technology inventions and life-saving medical devices.
- Support the identification of opportunities, gaps and complementarities in Ontario's innovation and entrepreneurial agenda when it comes to both small and large business research and development, and commercialization of embedded systems devices and products; and
- Demonstrate leadership in the facilitation of new and rapidly advanced embedded systems design, program and software device product development in order to serve Canadian business, industry, government and its citizens well.

**5. Certificate Structure:** The certificate structure is described in the chart on the following page.

**6. Development Plan:** In planning for the development of this certificate program, the certificate's courses will be rolled-out over the next two years. Delivery would commence in Winter 2013. Near term development includes the content authorship of the certificate's six courses, with anticipated staging for roll-out over 2012-13 and 2013-2014.

**7. Societal Need:** In its new report, "The Race for Global Leadership in Innovation: An Analysis of National R&D Strategies,"<sup>5</sup> the Toronto Region Research Alliance offers a supply/demand analysis of more than 60 occupations including in applied technology, applied science, health and business. The report finds that Research and Design applied technology and engineering occupations will be in demand and undersupplied in Toronto in 2012. The report observes a high demand for combined applied technical and entrepreneurial skills by innovation leader companies in the technological industries. This certificate assists in meeting this demand. In the "Sectors to Watch" section of the 2011 Annual TOP Report – Toronto's Opportunities and Priorities, Local Labour Market Update authored by TWIG (Toronto Workforce Innovation Group), technology-centric industries were cited as having the fastest rising demand for employees. The report also notes that Toronto is the third largest "employer city" in North America in the technology sector. Also noted is the soaring demand for "technology literacy skills across applied technology and applied sciences' occupations."

Top of the list for emerging themes and priorities in the labour market are the "green economy" and 'green' careers in response to a surge in demand. Careers writ large include computer programmers, robotics and embedded systems technologists, solar panel technicians and technicians who can design and build the embedded systems technology contained in medical equipment, electronics, and commercial products (e.g. wind turbines' technology). Among other top emerging labour market priorities mentioned were technological advancement and economic transformation.

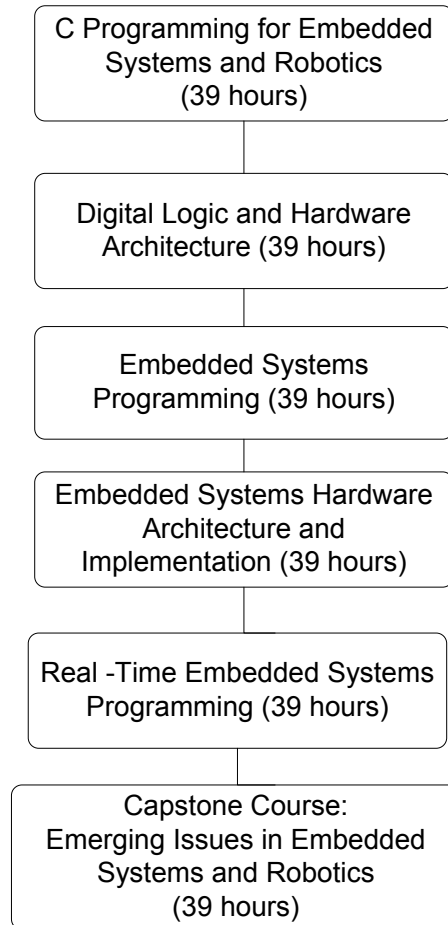
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<sup>5</sup> <http://www.trra.ca/en/index.asp>, accessed on February 26, 2012.

# Certificate in Robotics and Embedded Systems

## Curriculum Structure

### Required Courses\*



\*It is recommended that the required courses be taken before the Capstone course although the Capstone Course may be taken in conjunction with the fifth course of the certificate.

The Certificate will consist of six (6) 39-hour courses for a total of 234 hours of instruction. The last course in the certificate is a Capstone course.

In the certificate, candidates would develop current and relevant knowledge together with a set of valuable competencies and employability skills to meet the identified societal need, particularly in

perform embedded device product development found in green technology, electronics, medical equipment and commercial applications.

**8. Admissions:** The admissions requirements for this certificate program are one of the following sets of requirements depending on the status of the student:

1. Mature student status and evidence of relevant college or university level coursework; or equivalent as determined by the Academic Coordinator;  
OR
2. Mature student status and relevant industry or professional experience; or equivalent as determined by the Academic Coordinator.  
OR
3. Student who has completed the OSSD with six Grade 12 U or M credits, including a credit in English with a minimum grade of 70 percent; or equivalent; who has relevant college or university level coursework; or equivalent as determined by the Academic Coordinator;  
OR
4. Student who has completed the OSSD with six Grade 12 U or M credits, including a credit in English with a minimum grade of 70 percent; or equivalent; who has relevant industry or professional experience; or equivalent as determined by the Academic Coordinator.

It is recommended that certificate candidates have previous knowledge and experience that are technically-based in nature. For academic advising, students are encouraged to contact the Academic Coordinator for further details. This certificate is principally for programmers, technologists, hardware/software programmers and technologists, communications and networking professionals, control systems technologists, C programming software specialists and other technical professionals involved with or having an interest in Robotics and Embedded Systems design and development.

Additionally, this certificate for professionals of all backgrounds who had experience with computer programming – in any language(s) – and/or who have technical industry experience.

**9. Academic Governance:** The academic home of this certificate will be the Department of Mechanical and Industrial Engineering in close collaboration and consultation with the Department of Electrical and Computer Engineering and the Department of Computer Science. The normal procedures and prescriptions mandated by Policy #76 shall apply to the academic and administrative oversight of this certificate offering.

### **Recommendation**

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Chang School Certificate in Robotics and Embedded Systems.*

## **E. PROPOSAL FOR A CHANG SCHOOL CERTIFICATE IN MINING MANAGEMENT**

**1. The Proposal:** The Chang School, in collaboration with The Ted Rogers School of Management, is proposing a Certificate in Mining Management. The Certificate courses are all at fourth-year degree level and are for-credit courses.

**2. Certificate Goals:** The primary goal of this certificate is to provide students with additional competences in natural resource development, financing, and value creation in the mining industry. Aligned with this goal is that of providing reputable, university-level education which elevates the competency and relative desirability of certificate graduates in their fields. Ensuring employment-relevance continues to be a high priority, and so the certificate has been developed in close consultation with industry experts and Ryerson faculty. Finally, the certificate may be programmed in a 'module' format to afford students maximal flexibility.

**3. Certificate Structure:** The proposed Mining Management Certificate is designed with three components:

*Preparation* – ensuring prospective students have the correct background to be successful in the program through an application for pre-approval.

*Mining Management* – five required courses (195 hours) focus on business issues in the global mining sector (includes a specific region when partner institutions are involved); and

*Certificate completion* – 39 hours on an experiential/workplace project delivered as a capstone course.

The charts on the following two pages depict the curriculum components and structure.

**4. Development Plan:** Course development of the proposed certificate's new curriculum (six courses, certificate credit) will begin as soon as the certificate is approved and an Academic coordinator selected. The Academic Coordinator will select individuals to develop the courses. To date, individuals from TRSM, the Certificate Steering Committee, instructors from the Project Management Certificate and other interested faculty have expressed interest in developing courses for the certificate. The certificate launch date is Fall 2012.

**5. Societal Need and Target Group:** The Program Advisory Committee confirms that there is an urgent need in the mining industry for employees who have practical as well as theoretical skills such as project management, and who understand and have been exposed to real world cases and simulations. The proposed Mining Management certificate will produce graduates who can work in a global environment and span the disconnects between science and business and community development and business. They may have job titles as managers, financial analysts, environmental coordinator, community developer and other positions requiring the application of cross-disciplinary skills.

Mining is an incredibly diverse sector, with more than 120 occupations ranging from skilled trades to high tech professionals. In the assessment of the societal need for the proposed Mining Management.

## Overview of the Certificate Components

Sub Area	Courses	Code	Duration	Format
<b>Preparation</b>				
Application for Pre-Approval	To review the prospective students' education and work experience to determine what gaps, if any, need to be addressed before starting the certificate program.		TBD	Online
Mining Basics (as required)	<b>Required prerequisite courses (or their equivalent) include:</b>			
	Introduction to Mining Management	CZMM100	39 hours	Class
	Geoscience for Managers	CZMM200	39 hours	Class
Business Basics (as required)	<b>Required prerequisite courses (or their equivalent) include:</b>			
	Financial Accounting	CACC100	39 hours	Both
	Management Accounting	CACC406	39 hours	Class
	Managerial Finance I	CFIN300	39 hours	Both
	Business Law	CLAW122	39 hours	Both
<b>Mining Management</b>				
The Certificate Courses	<b>Required</b>			
	CSR, Sustainability and Mining	CZMM403	39 hours	Onsite
	Resource Valuation, Financing and Investor Relations	CZMM420	39 hours	Onsite
	<b>Electives</b> (Choose three)			
	Exploration and Development Operations	CZMM411	39 hours	Online
	Mining Sector Accounting	CZMM422	39 hours	Online
	Risk Management and the Mining Sector	CZMM421	39 hours	Online
	Mining in the Global Environment	CZMM430	39 hours	Online
<b>Certificate Completion</b>				
Capstone	Capstone Course	CZMM500	39 hours	Individual
<b>Total Hours</b>			<b>234 hours</b>	

**The Curriculum Structure**

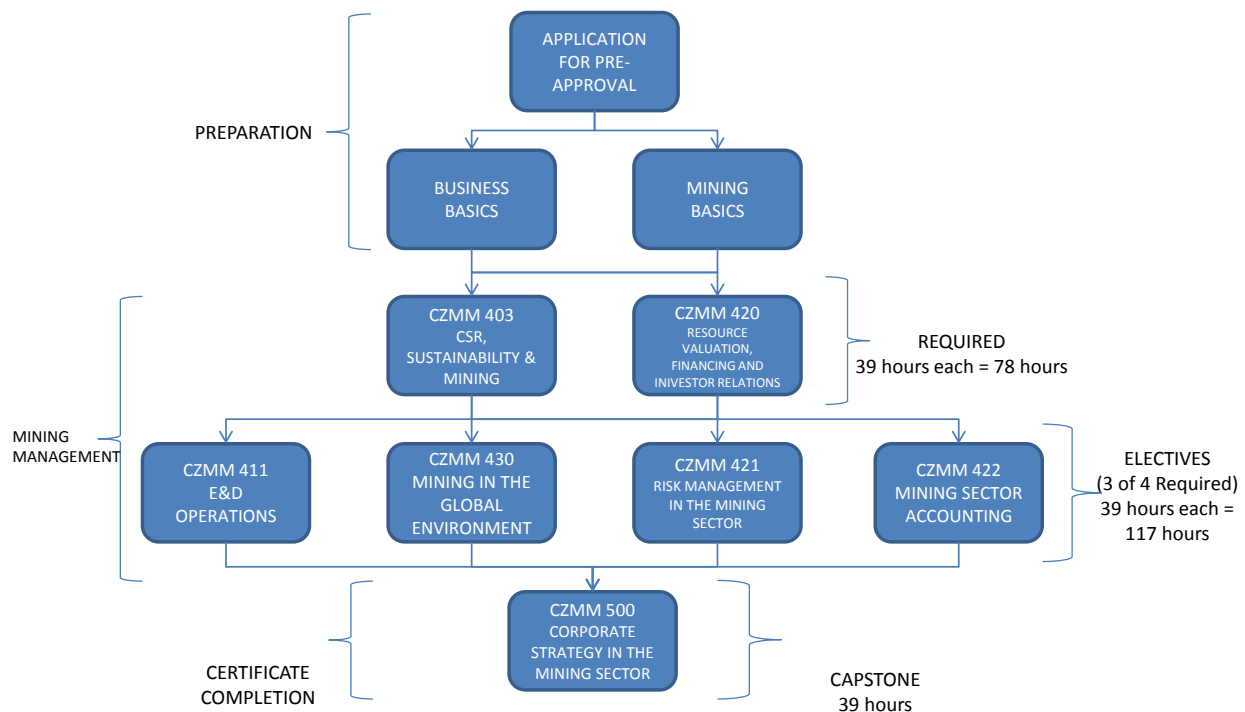


Figure 1 - Proposed Curriculum Structure – Certificate in Mining Management (234 total hours of instruction)

Certificate, current and historical employment circumstances in Canada have been examined. See Appendix D for the full report.

**6. Admissions Requirements:** To be admitted into the certificate, the candidate must have a relevant bachelor’s degree and/or a minimum of 5 years work experience in a relevant industry. Depending on the nature of their degree and of their work experience, certificate candidates may need preparatory courses. What, and how many, courses a certificate candidate may need must be determined in consultation with the Certificate Academic Coordinator, consistent with the application pre-approval process.

Specifically admission requirements are: Bachelors degree in a relevant area with a GPA of 2.0, or equivalent; **OR** A post-secondary diploma in a relevant area with a GPA of 2.0, or equivalent, subject to the approval of the academic coordinator; **OR** Five years of work experience in a related industry in a social or technical capacity, subject to the approval of the academic coordinator.

**7. Academic Management and Governance:** This certificate proposal, once approved, shall be governed by the provisions of Senate Policy No. 76, including the composition and functioning of the Certificate’s Standing Curriculum Committee.

The Standing Curriculum Committee shall consist of experts in mining and business-relevant fields including faculty members (who must comprise a majority) from the Ted Rogers School of Management

### **Recommendation**

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Chang School Certificate in Mining Management.*

## **F. PROPOSAL FOR A BACHELOR OF SCIENCE DEGREE PROGRAM IN BIOMEDICAL SCIENCES**

**1. Introduction:** There is a clear need for a workforce literate in the principles of biomedical sciences (BMS) that can take advantage of the career opportunities available now and in future. To meet this need, an undergraduate BMS Program will impart knowledge of advanced principles of genetics, cell and molecular biology, infectious diseases (microbiology) and other biomedical fields to Ryerson's undergraduate students interested in careers and graduate studies in all health-related sciences, biotechnology and pharmaceutical industries.

The proposed program has a target intake of 100 students, 310 at steady state, who will be affiliated with the Faculty of Science. The proposal calls for the hire of 7 new hires, 2.5 technical support staff and 1 administrative assistant. The program will be administered by the Department of Chemistry and Biology. The proposed degree program has no licensing or accreditation requirements. The proposed start date for the program is Fall 2013.

**2. Societal Need and Career Opportunities:** Ontario is the fourth-largest life science cluster in North America, mostly concentrated in the GTA. In downtown Toronto alone, there are nine research hospitals, two Universities (including Ryerson), 5,000 principal investigators and a research budget of \$1 billion per year. There are over 300 biotechnology and pharmaceutical companies within Ontario that include multi-nationals such as Sanofi Pasteur, Apotex, GlaxoSmithKline, AstraZeneca and Eli Lilly. Pharmaceutical companies alone employ 10,000 people and spend about \$500 million per year in research and development in the GTA. Significantly, the pharmaceutical and biotechnology industries are predicted to continue growing within the GTA. For example, the MaRS Project, an incubator for biotech start-ups steps away from Ryerson University, is now in its second phase of construction and will be adding 230,000 m<sup>2</sup> of new space when complete.

Given the significant presence of the life sciences in the Toronto area, BMS graduates may seek direct employment and develop careers in clinical and forensic laboratories, in the biotechnology and pharmaceutical industries, and in biomedical research institutions. Alternatively, a deep understanding of BMS will better position many of our students for admission to graduate studies and/or professional degrees. Lastly, individuals literate in BMS are often sought by non-standard sectors including various non-governmental organizations, health administration, policy organizations, consulting management and patent law firms. Overall, the BMS degree aims to produce highly-qualified individuals that will successfully support societally-relevant sectors including the pharmaceutical and biotech industries, and



biomedical research. The BMS Program will also be a facilitating step to establish ties with the University Health Network in Toronto and enhance SRC productivity within Ryerson.

**3. Admission Requirements:** Ontario Secondary School Diploma (OSSD) or equivalent with a minimum of six Grade 12 U or M courses including the following program specific requirements (a minimum overall average of 70% establishes eligibility for admission consideration; subject to competition individual programs may require higher pre-requisite grades and/or higher overall averages):

- English/Anglais (ENG4U/EAE4U preferred)
- Advanced Functions (MHF4U)
- Two of Biology (SBI4U), Chemistry (SCH4U) or Physics (SPH4U)

The minimum grade(s) required in the subject prerequisites (normally in the 65-70% range) will be determined subject to competition. All three grade 12U sciences are recommended. This program selects students on the basis of academic achievement /grades only. Additional non-academic requirements are not required for admission consideration.

**4. Curriculum:** The BMS program structure is composed of forty-two courses that will be integrated into a four-year B.Sc. degree and are categorized as follows:

- 1 Orientation Course (SCI 180) in year 1
- 1 BMC-specific orientation course in year 2
- 7 First-year Science courses
- 1 First-year Psychology course
- 2 Science Core courses in the second year
- 15 BLG/BCH/BMS Core courses throughout years 2, 3 and 4
- 3 BMS Core elective courses
- 6 Open elective courses
- 6 Liberal Studies Courses

The curriculum has 6 available open electives, which students can use to increase their knowledge in a specific biomedical area or complement their knowledge in some other area. The 6 open electives permit the student to obtain a minor in a different subject matter.

*Compatibility with the Common Science First Year and the BSc (Biology) Program:* A significant portion of the first and second year curriculum will be similar to the current general biology program to establish the basic fundamentals of science. This also facilitates student transfer opportunities. In third year, the students will begin to select electives designed to advance their knowledge in areas relevant to biomedical sciences which requires the development of 17 new courses (5 required, 12 elective). Some of these new courses will be carefully cross-listed with other programs including Biology, Medical Physics and Biomedical Engineering.

*Curriculum Details:* The following tables present the curriculum for both the regular and co-op versions of the program:

<b>a. COMMON TO ALL OPTIONS</b>		<b>Mode of delivery (hours per week)</b>		
		<b>Lecture</b>	<b>Lab</b>	<b>Tutorial</b>
<b>Semester 1</b>				
BLG 143	Biology I	3.0	1.5	
CHY 103	General Chemistry I	3.0		
MTH 131	Modern Mathematics I	4.0		1.0
PCS 120	Physics I	3.0	1.0	1.0
Liberal	Table A	3.0		
SCI 180	Orientation	1.0		

<b>Semester 2</b>		<b>Lecture</b>	<b>Lab</b>	<b>Tutorial</b>
BLG 144	Biology II	3.0	1.5	
CHY 113	General Chemistry II	3.0	3.0	
PCS 130	Physics II	3.0	1.0	1.0
Elective	Open Elective	3.0	*	
PSY 102	Intro to Psychology I	3.0		

<b>Semester 3</b>		<b>Lecture</b>	<b>Lab</b>	<b>Tutorial</b>
BLG 151	Microbiology I	3.0	3.0	
BLG 311	Cell Biology	3.0	1.5	
CHY 142	Organic Chemistry I	3.0	3.0	
MTH 380	Statistics I	3.0		1.0
Elective	Open Elective	3.0	*	

BMS 280	BMS Orientation II	1.0		
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<b>Semester 4</b>		<b>Lecture</b>	<b>Lab</b>	<b>Tutorial</b>
BCH 261	Biochemistry	3.0	3.0	
BLG 400	Genetics	3.0		1.0
BLG 411	Cell biology II	3.0		
BLG 600	Physiology	3.0		
Liberal	Table A	3.0		

**Mode of delivery (hours per week)**

**b. REGULAR PROGRAM**

<b>Semester 5</b>		<b>Lecture</b>	<b>Lab</b>	<b>Tutorial</b>
BCH 361	Advanced Biochemistry I	3.0	3.0	
BLG 307	Molecular Biology	3.0		
BLG 856	Immunology	3.0		
Elective	Open Elective	3.0	*	
Liberal	Table A	3.0		

<b>Semester 6</b>		<b>Lecture</b>	<b>Lab</b>	<b>Tutorial</b>
BMS XX6	Experimental Design	3.0		2.0
BLG 888	Molecular Biology Lab		3.0	1.0
Elective	Table X	3.0	*	
Elective	Open Elective	3.0	*	
Liberal	Table B	3.0		

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<b>Semester 7</b>		<b>Lecture</b>	<b>Lab</b>	<b>Tutorial</b>
BMS XX2	Systems Biology	3.0		
BMS X13	Critical Thinking in BMS	3.0		2.0
Elective	Table X	3.0	*	
Elective	Open Elective	3.0	*	
Liberal	Table B	3.0		

<b>Semester 8</b>		<b>Lecture</b>	<b>Lab</b>	<b>Tutorial</b>
BLG 8X1	Cancer Biology	3.0		
BMS X12	Stem Cell Biology	3.0		
Elective	Table X	3.0	*	
Elective	Open Elective	3.0	*	
Liberal	Table B	3.0		

**Table X: Electives. Students must select three (3) courses**

BMS 40A/B* Project-Thesis	BLG 251 Microbiology II	CHY 436 Pharmaceutical Chemistry
BMS 6X1 Molecular Genetics and Epigenetics	BLG 408 Viruses	PCS 229 Introduction to Medical Physics
BMS XX1 Advanced Immunology	BLG 409 Biometry	PCS 227 Biophysics
BMS XX3 Biochemistry of Disease	BLG 578 Pharmacology	PCS 230 Photonics and Optical Devices
BMS XX4 Medical Microbiology	BLG 678 Current Topics in Biology	PCS 300 Modern Physics
BMS XX5 Advanced Physiology	BLG 700 Anatomy	PCS 352 Nuclear Physics/Radiation Protection
BMS XX7 Infection and Immunity	BLG 702 Genomics and its Applications	PCS 354 Radiation Biology
	BLG 785 Developmental Biology	PCS XX1 Cellular Biophysics
	BLG 788 Current Topics in	

BMS XX8 Human Genetics	Biotechnology	PCS XX2 Nanophysics
BMS XX9 Medical Epidemiology	BLG 800 Genomics and Proteomics	PSY 202 Introduction to Psychology II
BMS X10 Model organisms	BME 501/ CPS 501 Bioinformatics	PSY 214 Psychopharmacology
BMS X11 Neurobiology	MTH 231 Modern Mathematics II	PSY 215 Psychology of Addictions
BCH 362 Advanced Biochemistry II	CHY 241 Organic Chemistry II	PSY 324 Biological Psychology
BCH 501 Protein Biochemistry and Proteomics		PSY 325 Psychological Disorders
BCH 580 Cell Signalling		

**c. CO-OPERATIVE EDUCATION PROGRAM**

		Mode of delivery (hours per week)		
		Lecture	Lab	Tutorial
<i>Co-operative Semester (Spring/Summer)</i>				
<i>WKT 405</i>	Work Term I	1.0		

<i>Semester 5</i>		Lecture	Lab	Tutorial
BCH 361	Advanced Biochemistry I	3.0	3.0	
BLG 307	Molecular Biology	3.0		
BLG 856	Immunology	3.0		
Elective	Open Elective	3.0	*	
Liberal	Table A	3.0		

<i>Co-operative Semester (Winter)</i>		Lecture	Lab	Tutorial
<i>WKT 505</i>	Work Term II	1.0		

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*Co-operative Semester (Spring/Summer)*

		Lecture	Lab	Tutorial
WKT 506	Work Term III	1.0		

*Co-operative Semester (Fall)*

		Lecture	Lab	Tutorial
WKT 605	Work Term IV	1.0		

*Semester 6*

		Lecture	Lab	Tutorial
BMS XX6	Experimental Design	3.0		2.0
BLG 888	Molecular Biology Lab		3.0	1.0
Elective	Table X	3.0	*	
Elective	Open Elective	3.0	*	
Liberal	Table B	3.0		

*Co-operative Semester (Spring/Summer)*

		Lecture	Lab	Tutorial
WKT 606	Work Term V	1.0		

*Semester 7*

		Lecture	Lab	Tutorial
BMS XX2	Systems Biology	3.0		
BMS X13	Critical Thinking in BMS	3.0		2.0
Elective	Table X	3.0	*	
Elective	Open Elective	3.0	*	
Liberal	Table B	3.0		

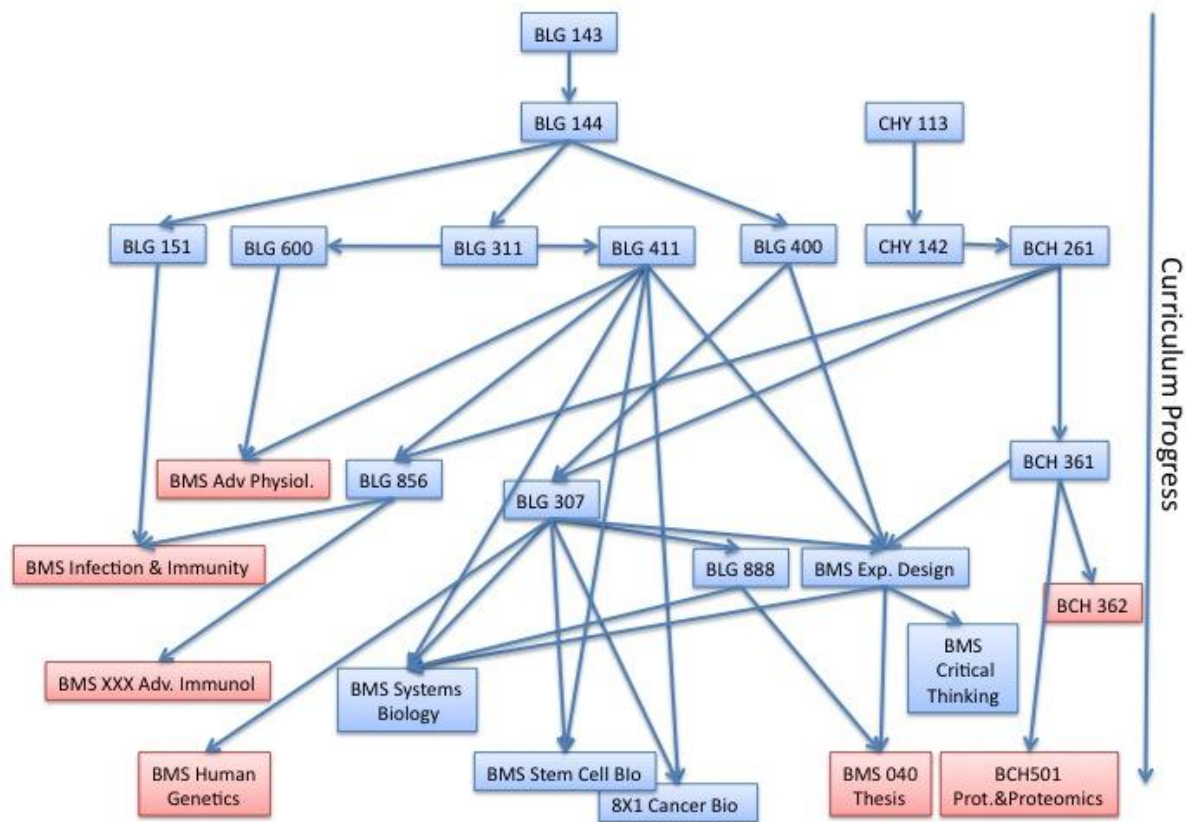
*Semester 8*

		Lecture	Lab	Tutorial
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BMS 8X1	Cancer Biology	3.0		
BMS X12	Stem Cell Biology	3.0		
Elective	Table X	3.0	*	
Elective	Open Elective	3.0	*	
Liberal	Table B	3.0		

The co-operative education curriculum is optional. Admission to the co-op option requires a minimum GPA of 2.67.

Prerequisite tree for proposed curriculum:



Blue are core courses and in those in pink are BMS elective courses. Note that the two orientation courses, SCI180 and BMS280, are also core program requirements.

*Mode of Delivery:* The course content will be delivered through a combination of lecture, laboratory and/or tutorial formats, as appropriate. These modes of instruction the curriculum will best deliver conceptual, theoretical and experiential learning to BMS students, while achieving the program goals and meeting our obligations under the IQAP (i.e., UDLEs). These modes of delivery are commonly employed in most science-based programs at Ryerson and in comparator institutions.

*Differentiation and Integration of the Program with other Existing or Planned Programs at Ryerson:* The core curriculum differs from the Department's current general biology program as it will emphasize mechanisms of disease and health, biomedical methodology and experimentation. The BMS program will greatly expand the courses offered in the Department and will synergize with programs in Biology, Chemistry and Medical Physics. The new program will facilitate the expansion or formation of additional multi-disciplinary programs that could include biology, chemistry, psychology, medical physics, engineering, business, nursing, health administration and public policy.

*Alignment of the Curriculum with Degree Level Expectations:* The BMS curriculum structure is designed to incrementally develop the program goals in compliance with UDLEs. The full proposal provides maps of the program goals to UDLEs and the course content to the program goals. The curriculum builds all program goals from an introductory to proficiency level over the four years of the program. The program goals are listed here:

1. *Demonstrate understanding of fundamental and advanced concepts, theories, models in biomedical sciences and mechanisms underlying health and disease states*
2. *Seek, interpret, summarize and primary sources and data and critically evaluate these to synthesize new questions, testable hypotheses and models*
3. *Articulate the theory, uses and limitations of research methodologies and tools employed in biomedical sciences*
4. *Select techniques, and formulate strategies for testing hypotheses.*
5. *The ability to effectively communicate concepts, models, theories and methods in biomedical sciences*
6. *Articulate the uses and value of knowledge including multi-disciplinary knowledge, and recognize and explain the limits of knowledge*
7. *Identify, recognize and apply general and professional skills related to the field of bio-medical sciences and related industries.*

**5. Peer Review Team Site Visit and Report:** The Peer Review Team (PRT)<sup>6</sup> site visit took place on April 13, 2012. The PRT "enthusiastically recommends approval of this exciting new program. The creation of this BMS program at Ryerson is timely and constitutes a logical and highly desirable extension to the

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<sup>6</sup> The PRT members were Profs. Roy Baker (University of Toronto), Justin Nodwell (McMaster University) and Catherine Beauchemin (Ryerson University).



Department of Chemistry and Biology's current offerings, building on the Department's strengths and diversity." The PRT indicates that approval of the BMS program will be instrumental in promoting growth and advancing Ryerson's reputation in research and in the delivery of a societally-relevant education. In particular, the PRT feels that the additional faculty hires requested in the proposal are not only vital to the proposed BMS program, but have the potential to be transformative for Ryerson's research landscape.

The PRT feels that the level of flexibility in the choice of courses offered to students in the proposed BMS program is unusual at the undergraduate level, is novel, and is a key asset of this program. BMS programs typically attract students seeking admission to medical school. While this is a laudable goal, given that only ~5% of medical school applicants can usually expect to gain admission, it is very important that students have alternative plans built into their degree, preferably from the outset of their time in university.

The number of elective courses (core and open) built into the proposed BMS curriculum makes it uniquely suited to facilitate this. In order to ensure the students are properly guided in making course selections that are consistent with their priorities, the PRT made recommendations to the program committee and these are listed below. The PRT encourages an approach where students would be encouraged/expected to make intelligent choices regarding specializations within the BMS program as soon as they start university. To facilitate this there should be interactive counselling and guidance provided by the BMS program office.

The proposed core curriculum is in line with the offerings of BMS programs at other institutions. Core upper year courses such as *Stem Cell Biology* and *Cancer Biology* give Ryerson's BMS program a very attractive currency. The PRT is particularly excited by the upper year core courses in *Experimental Design* and *Critical Thinking* in BMS which will compel students to apply their theoretical knowledge to practical issues. These two core courses ensure all students graduating from Ryerson's BMS program will have an opportunity to apply their knowledge to real-world problems and experience the relevance of their newly-acquired skills.

The PRT notes that upper year core courses in the BMS program do not include laboratories and that some should be added to ensure students can put into practice their newly-acquired critical thinking skills and cement these concepts. The PRT encourages the Department to seek accreditation for its courses from Canadian and US medical schools to further increase the appeal of the program.

In order to insure the program is genuinely medically relevant, the PRT recommends the Department ensures courses relate their topics to health and diseases whenever possible. The visitors strongly encourage consistent application of theoretical knowledge to real-world concerns throughout the curriculum.

For a BMS student to find her or his ultimate career goal within the program, the PRT feels that simply providing students with options will not be sufficient. The Department rightfully asks for additional administrative support to establish a program office to help guide students in the BMS program through these choices. The PRT echoes the Department's request for this resource. However, it is the opinion of

the PRT that the student's personal experience and exposure to a topic, more so than advice they receive from others, shapes their decisions. As such, the PRT proposes that the Department consider the following two suggestions:

1. Addition of a 2nd year course which would expose students to the range careers in health-related fields.
2. The construction of job-related course packages to make choosing elective courses easier for students and to encourage a more strategic approach in course selection. A near-term objective for the program director should be the identification of course packages drawing on existing courses and/or developed in collaboration with other programs in relevant career streams. These include but are not limited to, the biotechnology sector, entrepreneurship, business management, financial planning, health policy and law.

The PRT feels the new faculty positions must be tenure-stream to attract high-quality researchers. The PRT also recommends that these hires be moved up by one year (first two in 2013) to allow the new faculty to adapt to their new institution, explore funding opportunities, and set up their research laboratory before they are asked to focus on the design and construction of the program's new courses. It is critical that the new faculty members be provided with appropriate space to set up their research laboratory.

The PRT remarked that the research output of current faculty in the Department is outstanding considering their heavy teaching load (3 courses per year) which is atypical for BMS programs. The PRT cautions the administration that such a heavy teaching load could make it difficult to retain high-calibre faculty in the research areas identified in the proposal. This program will be in direct competition with existing programs at more research-intensive universities such as McMaster and the University of Toronto.

*Immediate recommendations:*

- Implementation of a course choice table (noting suitable electives from a variety of departments) for a few (1 or 2) practical employment streams with additional streams to be developed later
- The addition of a BMS-specific career-orientation course (BMS280)
- Moving the hiring of the new faculty members up by one year from 2014 to 2013
- Closer interaction with departments outside the immediate Life Science sphere (Business Management, Health Management, Economics) in designing suitable "pods" of business and health care relevant collections of elective courses

*Long-term recommendations:*

- More labs in upper year courses
- Lowering the teaching load of research intensive faculty

**6. Program Response to PRT Report:** The PRT made 6 recommendations for improvements or modifications of the program. This section describes the program's responses to these recommendations.

1. Implementation of courses choice table: One mandate of the appointed program director for this program will be to design such tables for counselling purposes and to use in the 2nd BMS year orientation course.

2. Addition of a career-focused orientation course: The program agrees with this suggestion and has already implemented such a course (BMS 280) into the curriculum in 3rd semester.

3. Move the hiring of the faculty up one year from 2014 to 2013: The program has no control over this although it is an excellent suggestion. It would allow new faculty the time to establish their research and secure funding before dedicating time to the design and delivery of new courses.

4. Closer interaction with departments outside of chemistry and biology: Again a great suggestion and the program did send the draft proposal to several other departments for their input as they envision that biomedical students with a minor in other areas such as public administration, policy development, business would be a great asset to the program. So far the program has had a very positive response from the Entrepreneurship and Strategy department and hopes to design a course choice table for this option in the very near future.

5. More labs in upper year: The program has already implemented this suggestion and added 4.5 more labs hours from semesters 4 to 8.

6. Lower teaching loads: The program has no control over this suggestion, although it does see value in the implementation of lower teaching loads for research intensive faculty.

**7. Dean's Response to the PRT Report:** The Associate Dean (writing on behalf of the Dean) is very excited about the prospective avenues that a BMS program will provide, and enthusiastically endorses the program.

The PRT and Advisory Council members expressed enthusiasm for the program. They felt that the proposed curriculum was current, in line with that at other institutions, and intellectually rigorous. They also expressed excitement over some of the program's more unique elements, such as a course in *Critical Thinking* and *Experimental Design*, as well as cutting-edge elements such as *Stem Cells* and *Systems Biology* in the core. One Advisory Council member did express reservations about the same courses that were lauded by the PRT. However, his opinion is not that these courses lack value, but that they need to be better defined, to maintain intellectual content. The Dean expressed agreement with this view.

The PRT were very positive about the open curriculum, which allows for substantial student choice; however, they also felt that providing choice would not benefit the students unless appropriate career guidance was also provided. During their discussions, the committee and PRT agreed that adding a

second-year seminar course (1 h/wk, P/F grading with mandatory attendance and brief assignments or online quizzes) would go a long way to educating students on their options. The course has been added to the core in the latest version of the proposal. Although its addition brings the total number of credits to 42, it should be kept in mind that two of those credits are for the orientation course in first year (SCI 180, 1 h/wk, P/F) and the proposed second year course (BMS280).

During the site visit, the committee and the PRT had lengthy discussions about the creation of joint programs with other departments and Faculties at Ryerson. In particular, they expressed enthusiasm for a joint program between BMS and Entrepreneurship, and felt that it would be a missed opportunity for Ryerson if we did not pursue it. At this point, the Dean does not recommend suspending the implementation of the current proposal in order to add joint programs to the document. The proposed program should rather be viewed as a foundation with tremendous potential to be built upon.

While the PRT believed that the program has the necessary intellectual rigour, they also felt that there was a lack of laboratories in the upper level courses. The committee agrees, and has added three half-labs (3 h/wk every other week) in *Immunology*, *Cancer Biology* and *Systems Biology*. The committee has also discussed linking the labs with the *Experimental Design* course; i.e., *Experimental Design* would be a prerequisite to these upper level labs and students would be expected to use the principles of experimental design to complete the labs. I am supportive of that link and believe that it will help students to develop a more independent and critical mind-set in the lab.

The addition of these labs will not be without cost to the University. The proposed program will increase the biology intake by roughly 50%, which is unlikely to be accommodated by the current teaching lab space, even with a full slate of night sections. The Department is currently conducting an analysis of the need for new lab space as is the University Planning Office.

The PRT and Advisory Council members stressed the importance of the experiential component, especially of encouraging our students to explore research opportunities. This year the Biology professors hosted 25 undergraduates as thesis students in their laboratories. That accounts for about 25% of the graduating class. Each year nearly all of the students seeking positions in the thesis course are accommodated. Because of the high faculty time commitment and materials cost of hosting a student for a lab-based research project, the committee feels, and I agree, that making the thesis course mandatory would not be achievable or desirable. On the other hand, all students will be encouraged to participate in research where possible. This can be achieved through a summer employment opportunity, for example. In terms of experiential learning, students can also opt to take the Co-op version of the degree.

The PRT has indicated that recruiting faculty with expertise in the biomedical sciences will be difficult without adequate funding and lab space. While the low teaching loads suggested by the PRT members may be unachievable at Ryerson, a *lower* teaching assignment must be seriously considered.

**8. ASC Evaluation:** The ASC agrees with the PRT evaluation of the program as being strongly designed, current, in line with those at other institutions, and intellectually rigorous. The flexibility in the curriculum, described as a program strength by the PRT, is also well aligned with the direction of Ryerson's curriculum renewal initiative.

The ASC also recognizes that a program of this type will add breadth to the offerings of the new Ryerson *Faculty of Science* as well as build its research capacity. The location of the program within the Toronto Discovery District, with its major cluster of biomedical research institutions, provides potential synergies for the program as well as opportunities for employment or further education for program graduates. The ASC would also like to recognize that the program proposal was exceptionally well prepared and written and thanks the proposers for their efforts.

The ASC recognizes the value of the program-specific orientation course BMS280 (*BMS Orientation II*) in helping program students consider career directions beyond possible admission to medical school. **The ASC recommends that as the course content is developed, the program consult with others on campus who have experience developing university-orientation courses.** In particular, BUS100 in the Ted Rogers School of Management stands out as a successful course of this type. Further, the Learning and Teaching Office has expertise and best practice advice for such courses which should be considered. The goal of this consultation is to make BMS280 as effective as possible.

The program design includes discussions of bio-ethics. ASC applauds this feature but **recommends that discussion of ethics in the program be sufficiently broad to include elements that intersect with aspects of inclusion, diversity and equity.** Personalized medicine is an example of an issue where bio-ethics and inclusion/equity intersect. In addition, the program should ensure that the bio-ethics content include discussion of ethical treatment of animal subjects, as well as alternatives to animal models in research.

### **Recommendation**

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

## **G. PROPOSAL FOR A BACHELOR OF COMMERCE DEGREE PROGRAM IN REAL ESTATE MANAGEMENT**

**1. Introduction:** Real estate is a large industry sector – of great importance to the economies of Canada and the Greater Toronto Area. Only two Canadian business schools (Guelph and UBC) offer undergraduate programs in real estate. This presents an opportunity for Ryerson to serve the community by producing well-educated management professionals to lead the real estate industry into the future.

This proposal recommends a new Major in Real Estate Management to be offered through a new Real Estate Management department within the Ted Rogers School of Business Management. The proposed

intake target is 100 students per year with a steady-state of 315 students in a four-year program. The proposal indicates a need for three new tenure-stream hires as well as one administrative staff position. Authorization to proceed on this proposal was granted by the Provost in a letter dated February 16, 2012. The anticipated program launch is Fall 2013. Since this program will share a common first year with all other Business Management Majors, the first students will not start taking specialized program courses until Fall 2014.

**2. Societal Need:** The real estate industry accounts for a significant share of Canadian employment. In Toronto, over 68,000 jobs are in the real estate sector. These jobs include professionals in real estate property development, leasing management, real estate investment, property appraisal and brokerage. Not included in the above figure are the thousands of jobs in construction management and real estate-related jobs in banking and government.

The Government of Canada website “Working in Canada” provides labour market information and projections for the number of job openings by sector. They project that there will be 236,339 openings for the jobs classified as (1) Insurance, Real Estate and Financial Brokerage Managers, (2) Real Estate Agents and Salespersons and (3) Assessors, Valuators and Appraisers over the period 2011-2020 in Canada. They also predict just 174,090 job seekers in this sector, meaning that there is a favourable employment outlook for these professions. Students graduating with Ryerson’s new Major in Real Estate Management will enjoy opportunities in these job categories and in many others as well. In addition, industry support for the proposed real estate program has been very strong. Appendix I of the proposal provides a list of distinguished real estate industry professionals who have agreed to serve on the advisory council.

One unique feature of the proposed Major is the required course on Sustainability in Real Estate and the program’s commitment to green principles. This aspect also addresses societal needs for intelligent development.

Currently, only two of the many business schools in Canada offer education in real estate management. These are the Urban Land Economics program at the Sauder School of Business at the University of British Columbia, and the Real Estate and Housing program from the Department of Marketing and Consumer Studies at the University of Guelph. There are more than 50 universities in the U.S. where undergraduate students can pursue an undergraduate degree specifically in real estate. In contrast, the vast majority of real estate practitioners in Canada do not have the benefit of a comparable educational foundation.

**3. Alignment with Expertise/Student Demand:** Currently, students enrolled in the TRSM Master of Business Administration (MBA) may choose to specialize in Retail and Commercial Development. Existing MBA-level courses already taught by faculty associated with the planned new Department of Real Estate Management include Real Estate Finance and Real Estate Development. Therefore, this new undergraduate program is consistent with expertise already present within Ryerson. The proposed program is a natural fit because of Ryerson’s excellent existing programs in real estate related fields such as Geography and Urban Planning, our location in the heart of the city, our overarching goal to

strike a balance between theory and application, our support from industry, our existing faculty teaching in the MBA program in real estate and our level of student interest.

The anticipated student clientele for the Major in Real Estate Management are those students in the Ted Rogers School of Business Management with an interest in the field. An additional 100 students will be admitted to the Ted Rogers School of Business Management annually after the approval of this program, and it is expected that approximately this same number will choose to major in Real Estate Management. This level of interest is supported by the large size of the membership in the Ryerson Real Estate Club.

**4. Admission Requirements:** The requirements listed here are the same as all other full-time Business Management majors. The admission requirements for the direct entry and part-time programs are not included for brevity's sake, but can be found in the current edition of Ryerson's undergraduate calendar.

**ADMISSION:** O.S.S.D. with six Grade 12 U/M courses including Grade 12 U courses in: English and Mathematics (one of Grade 12 U Advanced Functions (MHF4U), Calculus and Vectors (MCV4U) or Mathematics of Data Management (MDM4U)).

**NOTES:**

1. ENG4U/EAE4U is the preferred English.
2. The grade(s) required in the subject prerequisites (normally in the 70 percent range) will be determined subject to competition.
3. Grade 12 U Advanced Functions (MHF4U) or Grade 12 U Calculus and Vectors (MCV4U) are the preferred Mathematics courses.

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

**5. Curriculum:**

*Program Description* - The structure of the program will be consistent with other Majors in the Ted Rogers School of Business Management: seventeen core business courses, six liberal studies courses, six professionally-related courses and thirteen discipline-specific real estate management courses comprise the degree. Of these thirteen real estate management courses, seven will be required and the remaining six will be selected by students from a list of professional electives. These courses are new, with the exception of the existing *Advanced Business Law* course offered by the Department of Law & Business and three courses offered by the Department of Geography.

The proposed curriculum will give students a strong foundation in real estate management. It provides students some opportunity to select courses to customize their experience given their own interests and career aspirations. There will be an emphasis on the principles of sustainability, integrity, ethical behaviour and social responsibility in the *Sustainability in Real Estate* course and in the *Real Estate Project* capstone course.

*Description of the Curriculum* – The proposed curriculum is provided in the following tables.

Overview of the entire program:

Semester 1	Semester 2
BUS100 Strategies for Success	GMS200 Introduction to Global Management
ECN104 Introductory Microeconomics	MHR523 Human Resources Management
ITM102 Business Information Systems I	MKT100 Principles of Marketing
ACC100 Introductory Financial Accounting	ACC406 Introductory Management Accounting
QMS102 Business Statistics I	ECN204 Introductory Macroeconomics
Liberal studies elective	QMS202 Business Statistics II
Semester 3	Semester 4
CMN279 Intro to Professional Communication	LAW122 Business Law
FIN300 Managerial Finance I	Liberal studies elective - Table A
GMS401 Operations Management	FIN401 Managerial Finance II
Liberal studies elective	<b>REM400 Real Estate Finance I</b>
<b>REM300 Introduction to Real Estate</b>	<b>REM420 Sustainability in Real Estate</b>
Semester 5	Semester 6
Professionally-related course	Professionally-related course
Liberal studies elective	Professionally-related course
<b>REM500 Real Estate Development and Project Mgmt</b>	Liberal studies elective
<b>REM620 Real Estate Economics I</b>	<b>Real Estate Management professional elective</b>
<b>LAW603 Advanced Business Law</b>	<b>Real Estate Management professional elective</b>



Semester 7	Semester 8
Professionally-related course	BUS800 Strategic Management
Professionally-related course	Liberal studies elective
Professionally-related course	<b>Real Estate Management professional elective</b>
<b>Real Estate Management professional elective</b>	<b>Real Estate Management professional elective</b>
<b>Real Estate Management professional elective</b>	<b>REM800 Real Estate Project Capstone</b>

Real estate management specific courses, required and professional electives:

Course name	Course code	New or existing?
REQUIRED COURSES		
Introduction to Real Estate	REM300	New
Real Estate Finance I	REM400	New
Real Estate Economics I	REM520	New
Real Estate Development and Project Management	REM500	New
Sustainability in Real Estate	REM420	New
Advanced Business Law	LAW603	Existing
Real Estate Project Capstone	REM800	New
PROFESSIONAL ELECTIVES		
<i>Students choose six.</i>		
Real Estate Law	LAW703	New
Housing and Construction Management	REM600	New
Real Estate Finance II	REM620	New
Real Estate Economics II	REM750	New
Real Estate Valuation	REM700	New
Real Estate Strategic Management	REM660	New

Location, Location, Location	GEO151	Existing
Principles of Demography	GEO231	Existing
GIS and Business	GEO719	Existing

The curriculum as described is consistent with the new curriculum framework approved by Senate in July 2011.

An additional feature of the program expected to draw students is a “career-related summer employment” opportunity planned for the summer after the third year. This summer employment opportunity will be paid whenever possible but will not be compulsory for students as it is not-for-credit. It is not part of the degree curriculum *per se*, but the Department will help students connect with potential employers.

The proposed curriculum has been discussed with chairs and directors in the Ted Rogers School of Management. The Geography department has approved the plan to allow B. Comm. students majoring in Real Estate Management to enroll in the selected Geography classes.

The proposed new program is consistent with all the criteria associated with the AACSB accreditation.

*Experiential Learning* - Classes will balance theory and practicality and will provide a very significant number of experiential learning opportunities. To date, many of the firms represented on the Advisory Council such as RealNet and Cadillac Fairview, have agreed to participate in various experiential learning programs for students. The proposed new program will use a variety of experiential learning methods. Certainly the summer employment opportunity will give students an opportunity to obtain industry experience related to their academic studies. This form of experiential learning is valuable in helping students apply concepts from the classroom to the real world. The industry experience will also give students valuable real estate-related experience on their curriculum vitae when they enter the job market after graduation.

Besides the summer employment opportunity, there are several other experiential learning activities planned for students. There are two capstone courses in the program. The first is BUS800, an existing required course for all Bachelor of Commerce students that integrates strategic thinking, finance, accounting and other business disciplines. The second capstone course is a *Real Estate Project Capstone*, a new, required course for students majoring in real estate management. This course will unite topics from earlier courses such as real estate financial analysis and real estate management through the use of a major project. Field trips to real estate sites will be an element of three courses: *Real Estate Development and Project Management*, *Sustainability in Real Estate*, and *Housing and Construction Management*.

**6. Comparable Programs in Real Estate:** The University of British Columbia (UBC) and the University of Guelph are the only universities in Canada with an undergraduate Major or specialization in real estate. Curriculum requirements are summarized in the table below.

	Required business courses	Elective courses	Real Estate courses
UBC	21	15	5
Guelph	17	11	12
Proposed new program	17	12	Select 13 of 16

UBC students earn a specialization by taking five courses in real estate. All five of these courses have an equivalent course in the curriculum for our proposed program. UBC has an internship program analogous to what Ryerson will offer. Guelph has a co-op program, while Ryerson will offer a summer employment opportunity. Guelph offers a course in Design and a course in Urban Planning. The program considers both of these to be excellent and relevant topics and plans to work with the Architecture and the Urban Planning departments in the future to find a way for Real Estate Management students to access courses of this kind.

**7. Undergraduate Degree Level Expectations:** The goals for the program are listed below with their associated learning outcomes.

**1. Analyze and solve quantitative problems arising in the real estate industry.**

- a. Analyze and solve problems in diverse areas within the real estate industry including mortgage investment, real estate investment, real estate development and real estate valuation
- b. Identify and apply appropriate mathematical tools
- c. Apply mathematical formulas to real estate decision-making
- d. Interpret the results of the quantitative analysis within the context of the issue under consideration to make appropriate recommendations

**2. Communicate information, arguments and analyses accurately and reliably, orally and in writing to a range of multi-disciplinary participants in the real estate industry.**

- a. Develop sound arguments
- b. Communicate effectively in written form for various audiences
- c. Communicate effectively in oral form for various audiences

- 3. Apply an integrated multi-disciplinary knowledge of major theories, concepts and related research to solve real estate problems.**
  - a. Identify the relevant legal framework and explain the implications
  - b. Accurately conduct quantitative analysis
  - c. Compare and contrast various stakeholder perspectives
  - d. Interpret research literature
  - e. Make decisions incorporating uncertainty and limits to knowledge and how this might influence analyses and interpretations
  
- 4. Explain the value and advantages to incorporating principles of sustainability, to respecting the diversity of the community through the values of equity and inclusivity, and to implementing ethical behavior consistent with integrity and social responsibility.**
  - a. Gather, review, evaluate and interpret information and research
  - b. Question assumptions concerning sustainability with research evidence
  - c. Compare the merits of alternative hypotheses or creative options
  
- 5. Formulate tactical and strategic directions in the management of real estate.**
  - a. Determining scope
  - b. Assessing data from various sources
  - c. Analyzing the needs and requirements of all stakeholders and developing integrated solutions
  - d. Management skills
  - e. Analyzing alternative strategies
  - f. Communicating information and preparing reports
  
- 6. Work productively in teams to solve complex, interdisciplinary problems related to real estate.**
  - a. Communicate effectively
  - b. Describe effective team dynamics
  - c. Solve team problems
  - d. Apply project management skills

- e. Work productively and effectively as team members
- f. Integrate information from various sub-disciplines to solve problems

In order to achieve mastery of a program goal, students will take courses that progress from an introductory level to reinforcement level and then finally to mastery. The curriculum mapping tables are provided in the full proposal.

**8. Peer Review Team (PRT) Report:** The PRT<sup>7</sup> visited Ryerson on March 30, 2012. The PRT noted that the proposed major clearly fits with the University's objective to provide undergraduate programs that balance theory and application, and prepare students for professional careers – in this case a professional career in real estate. The team is satisfied with the thoroughness of this pre-brief evaluation by the University.

In general, the team regards the proposed program, which dovetails nicely with the general B.Comm curriculum, as well conceived. There is a strong market for this kind of real estate education in the GTA as the only other similar programs are at the University of British Columbia and the University of Guelph. The program covers the finance, economics, and management issues that a strong real estate program must cover.

The proposed curriculum is coherent and constitutes a well-thought out package. The two business finance courses and two real estate finance courses provide ample instruction and experience to students in the most demanding aspects of any real estate program. There is more than one innovative feature to the proposed program. First, there is the course in sustainability, featuring green building, which should include significant material from environmental economics. This course would also benefit from the resources of the architecture program at Ryerson. A most important innovative feature is the inclusion of a course in GIS and its applications, along with the Principles of Demography, where GIS is applied further. The third course in law (LAW 603) is also an innovative and noteworthy feature.

In summary, this is a strong proposal and there is no doubt that it warrants approval. The team does, however, **recommend that (1) the program be strengthened by adding Real Estate Economics I to the list of required courses, and (2) inclusion of a module in real estate ethics. As the program develops a (3) planning course should also be added. Where possible, (4) presentations, reports, and like activities, should replace midterm exams in most third and fourth year courses.**

The proposed number of faculty is entirely suitable and realistic. The proposed levels of support staff and infrastructure are ample for the program.

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<sup>7</sup> Profs. Lu Han (University of Toronto), Marion Steele (Emeritus, University of Toronto), William Strange, (University of Toronto), Maurice Yeates, (Ryerson University, Team Chair).

**9. Program Response to the PRT Report:** The team considers the proposed curriculum to be coherent and recognizes the innovative features which include the emphasis on sustainability, a course in GIS and an advanced course in real estate law. The PRT has four recommendations that have already been addressed in a revised proposal document.

1. Real Estate Economics I should be made compulsory.
  - The program will implement this recommendation and will make Real Estate Finance II into an elective course. The overall level of choice will therefore not be affected.
2. A module in Real Estate Ethics should be added.
  - The program plans to address Real Estate Ethics in many courses, most specifically the Sustainability in Real Estate course.
3. A Planning course should be offered.
  - The program agrees and will pursue this idea with the Planning department in the future.
4. Presentations, reports and like activities should replace midterm exams.
  - The program plans for presentations, reports and like activities to be a significant portion of the final grade for upper level real estate courses, although these are not expected to always displace midterm exams.

**10. Dean's Response to the PRT Report:** The Peer Review Team provided an extremely positive assessment of the proposed major in Real Estate Management in our Bachelor of Commerce program. Indeed the committee was extremely supportive of a number of specific attributes of the curriculum. These Included:

- the overall goals and objectives of the program;
- the innovative nature of the curriculum and in particular courses in the program that focused on sustainability and GIS and real estate and business management;
- our proximity and ability to link with the real estate industry;
- the quality and diverse expertise of the current faculty;
- the management focus of the program and
- the financial support for the program as reflected in the plan for new hires.

Three suggestions were raised in the review. The major concern, the need to add of a compulsory course in Real Estate Economics to the program, has been addressed by a minor curricular modification. This involves a transfer of Real Estate Finance II to the Professional Elective and a corresponding switch of Real Estate Economics from the elective to the Required course category.

The second issue related to the issue that a module in real estate ethics was incorporated in the program. Real estate ethics are discussed in a number of courses throughout the program and not just in a single module.

Finally, the review team did discuss the potential benefits from providing access to the resources of the architecture and urban planning programs. One on-going initiative that could provide this benefit would be the creation an interdisciplinary minor in real estate that would include courses from real estate management, geography, urban planning and architecture. If developed this minor would provide an option for students in the program that would broaden their perspective on real estate development.

**11. ASC Evaluation:** The ASC finds that the program design is strong and the societal need and graduate career pathways are well established. The ASC was also impressed with the explicit commitment to sustainability, professional ethics, and diversity/inclusion/equity expressed in the proposal (Program Goal 4). It sees the weaving of policy elements relevant to real estate throughout the curriculum, as opposed to presenting them in a stand-alone course, as strength of the design.

The experiential learning component of the program is a bit on the light side. While the summer employment opportunity is positive, **the ASC recommends that the program seriously consider the possibility of a formal co-operative education option at some future date.** ASC felt that the REM program would be an ideal program to host a co-op version.

## Recommendation

Having satisfied itself of the merit of this proposal, ASC recommends: *That Senate approve the proposed Bachelor of Commerce degree program in Real Estate Management.*

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

Trina Gover, 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

**YEATES SCHOOL OF GRADUATE STUDIES**

***REPORT TO SENATE, MAY 1, 2012***

1. Option in Medical Physics – ***PhD and MSc in Physics*** (for approval)

**Motion:**

“That Senate approve the *Option in Medical Physics* in the *PhD and MSc Physics* program, as approved by YSGS Council at its April 12, 2012 meeting.”

Submitted by:

A handwritten signature in blue ink, appearing to read 'J Mactavish', with a large, sweeping flourish underneath.

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Jennifer Mactavish, Dean  
Chair, Yeates School of Graduate Studies Council





RYERSON UNIVERSITY

DEPARTMENT OF PHYSICS

**Proposal:**

**Master of Science and Doctor of Philosophy in the field  
of Biomedical Physics**

**Option in Medical Physics**

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Version: April 17, 2012

## **Executive Summary**

Ryerson University is one of the 18 Universities in the province of Ontario (Canada) which are governed by the [1992 University Foundations Act](#). Ryerson offers more than 100 undergraduate and graduate programs and it is home to 28,000 students, including 2,300 master's and PhD students and nearly 2,700 faculty and staff. Located in downtown Toronto, Ryerson University also has Canada's largest continuing education program, with approximately 70,000 enrollments each year.

Biomedical Physics is a branch of applied physics that aims to understand and make use of the complex interactions between the physical and biological systems. Research done in Biomedical Physics shares common themes with three other areas of study: *Biophysics*, which is known as "the branch of knowledge that applies the principles of physics and chemistry and the methods of mathematical analysis and computer modeling to understand how the mechanisms of biological systems work" (source: *Biophysical Society* ([www.biophysics.org](http://www.biophysics.org))); *Medical Physics*, described as "an applied branch of physics concerned with the application of the concepts and methods of physics to the diagnosis and treatment of human disease" (source: *American Association of Physicists in Medicine* ([www.aapm.org](http://www.aapm.org))); and *Health Physics* as "the science and practice of radiation safety: understanding, evaluating and controlling the potential risks of radiation exposure on humans and their environment" (source: *Health Physics Society* ([www.hps.org](http://www.hps.org))).

The Department of Physics at Ryerson University offers an undergraduate B.Sc. degree in Medical Physics, and a M.Sc. and Ph.D. degree in Physics in the field of Biomedical Physics. The existing Master's degree program, in place since 2006, leads to a M.Sc. in Biomedical Physics. This program consists of full-time study including coursework and the preparation of a research thesis, typically completed in two calendar years. A total of 46 students graduated from the M.Sc. program until today. They have either continued in academia (Ph.D. positions at the University of Toronto, McMaster University, McGill University and the University of Western Ontario amongst other institutions), industry or hospitals. Information about their careers can be found either at the alumni section of the Department of Physics website (<http://www.physics.ryerson.ca/people/alumni>), or the Ryerson Physics Alumni [Linkedin](#) group (<http://goo.gl/w00Dy>).

Our Ph.D. program in Physics (in the field of Biomedical Physics) started in 2011. We currently have 26 graduate students enrolled in our programs; 5 in the PhD program and 21 in the MSc program. Detailed information about program admissions and requirements can be found at: [http://ryerson.ca/graduate/programs/biomedical\\_physics](http://ryerson.ca/graduate/programs/biomedical_physics).

There are 10 core graduate faculty members in the department (15 full time faculty members in total), 15 adjunct faculty members (primarily from the surrounding hospitals in the GTA) and 7 staff members. The Department of Physics is located on the second and third floor of the south east corner of Kerr Hall, part of the main quad building at the center of Ryerson University. All faculty members have appropriately furnished individual private offices and each office is equipped with a research-quality computer, connected to the University network. All graduate students have a personal office desk in the graduate student areas and also have a personal computer. Workshop space and research facilities, both for research and teaching requirements are also available to the faculty. All students enrolled in our programs at Ryerson University have access to an excellent array of computer hardware and software resources as well as Ryerson library with holdings appropriate to the size and nature of the graduate programs and the research activities of faculty members and students. These resources are either centralized and administered by University centers or are locally owned and administered by the Department of Physics.

## Background

Medical Physics is a branch of physics which involves application of physics concepts to the diagnosis and treatment of disease. Medical physicists who practice in a clinical environment are traditionally employed in one of the four subfields: therapeutic physics; diagnostic physics; medical nuclear physics and medical health physics.

The pathway to becoming a certified clinical medical physicist (figure 1) typically follows three steps: 1) completion of a graduate degree (typically a PhD in Canada) in medical physics or another physics discipline; 2) 2 years of on the job clinical training or completion of a medical physics residency program at a Hospital; and 3) completion of board certification exams. The role of the graduate program is to provide didactic education as well as research training and some basic clinical exposure. The role of the residency program, on the other hand, is to complete the clinical training necessary for the practice of clinical medical physics. It is important to make the distinction between the graduate program, which is offered by a university, and the clinical medical physics residency, which is typically offered by a teaching hospital (usually a cancer center).

Certification permits recognition of individuals having attained a certain standard of knowledge and skill necessary for clinical practice of medical physics. The certification process is regulated by the Canadian College of Physicists in Medicine (CCPM; [www.ccpm.ca](http://www.ccpm.ca)) in Canada and the American Board of Radiology (ABR; [www.theabr.org](http://www.theabr.org)) in the United States of America (USA) and is increasingly become a requirement for employment as a clinical medical physicist. Medical physicists in Canada and the US join their national organizations, the [Canadian Organization of Medical Physics \(COMP\)](http://www.comp.ca) and the [American Association of Physicists in Medicine \(AAPM\)](http://www.aapm.org), which are part of the international organization, [International Organization of Medical Physics \(IOMP\)](http://www.iomp.org).

### Graduate Training and Career Pathways in Medical Physics

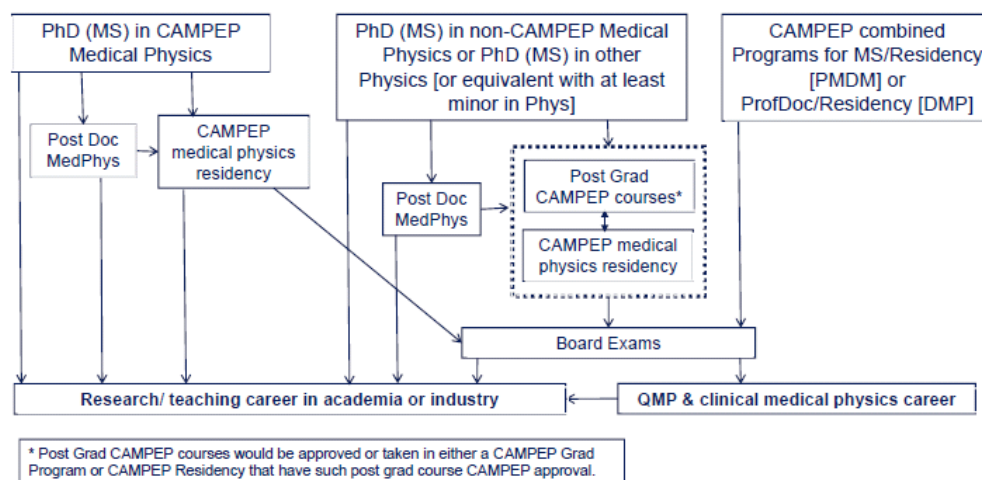


Figure 1: Education and training pathways to a career in medical physics [source: AAPM].

Starting in 2012, the ABR will require applicants for the board certification exam in Medical Physics to either have graduated from an accredited graduate medical physics program or, if their graduate degree is from a non-accredited program, to have additionally completed an accredited residency program. In 2014, application to Part 2 of the board exams will be further restricted by making completion of an accredited

residency program **mandatory**. The CCPM will implement the same requirement effective January 2016. Thus, by 2016, all applicants to the CCPM membership certification exams in Medical Physics will have to pass through an accredited medical physics residency program.

Graduate medical physics programs in USA and Canada may apply for accreditation from the Commission on Accreditation of Medical Physics Education Programs (CAMPEP) ([www.campep.org](http://www.campep.org)). While graduation from an accredited graduate medical physics program is not a requirement for acceptance into an accredited residency program, it is an asset for a candidate applying to a residency program. Since the announcement of ABR and CCPM 2014 and 2016 initiatives, the demand for accredited residency positions has significantly increased. Moreover, personal communications with program directors for residency programs indicates that a strong preference will be given to applicants from an accredited graduate medical physics program. Furthermore, residents who have not completed the required CAMPEP courses will have to complete them during their residency as an additional coursework.

### **Rationale and Opportunity for Ryerson University**

There is currently no CAMPEP accredited medical physics graduate programs in the Greater Toronto Area (GTA) or Hamilton, an area which encompasses six of the largest cancer centers in Canada employing many clinical medical physicists. However, an accredited medical physics residency is offered by the Department of Radiation Oncology of the University of Toronto based out of the Princess Margaret Hospital (PMH) and the Odette Cancer Center at the Sunnybrook Hospital (considered a very strong program internationally). Given its mandate for career-focused University education and the Department of Physics focus in Biomedical Physics, Ryerson University is *uniquely positioned* to fill the demand for a Toronto-based CAMPEP accredited medical physics graduate program. Graduates from this program would be able to complete an accredited residency program at the major Toronto cancer centers: the Princess Margaret Hospital (PMH), Sunnybrook hospital or other Hospitals, and seek employment at one of the many cancer centers in North America.

In Canada the accreditation is obtained through passing a rigorous evaluation of the program curricula and is required for medical physicists obtaining residency or career positions in starting 2016. CAMPEP standards pay special attention to the overall quality of the program (i.e., number and competence of the teaching staff; teaching loads, breadth and depth of instructional offerings; adequacy of facilities and supporting personnel; aptitude of its students; and performance of its graduates).

**Therefore we are proposing addition of an Option in Medical Physics in the Master of Science and Doctor of Philosophy in Physics in the field of Biomedical Physics** currently offered by the Yeates Graduate School at Ryerson. The accreditation of Master of Science and Doctor of Philosophy in the field of Biomedical Physics, Option in Medical Physics, is one of the strategic objectives of the Department of Physics. Furthermore, our efforts have the full support of the Dean of Engineering, Architecture and Science, Dr. M Lachemi (Appendix A). In fact, it was ranked as the highest priority for the faculty.

### **Objectives of the Option in Medical Physics**

The objectives of the Option in Medical Physics are to prepare its graduate students

- (1) for further education, teaching, and research in the area of medical physics,
- (2) to assume appropriate responsibilities in the clinical practice of medical physics
- (3) to enter a medical physics residency program in at least one subspecialty (radiation oncology, diagnostic radiology, or nuclear medicine).

### **Curriculum of the Master of Science and Doctor of Philosophy in the field of Biomedical Physics, Option in Medical Physics**

The required courses are consistent with the topics required by CAMPEP (specified in Report #197 of the committee of Education and Training of Medical Physicists of the American Association of Physicists in Medicine, [http://www.aapm.org/pubs/reports/RPT\\_197.pdf](http://www.aapm.org/pubs/reports/RPT_197.pdf)). The Master of Science in the field of Biomedical Physics, Option in Medical Physics comprises of 9 required courses, out of which two are Master Seminar courses, and 1 elective course as indicated in Table 1.

Table 1: Degree requirements of Master of Science in the field of Biomedical Physics, Option in Medical Physics

<b>Master of Science in the field of Biomedical Physics</b>	<b>Required/ Elective</b>	<b>Credits</b>	<b>Faculty member(s) Responsible for teaching</b>
BP8102: Medical Diagnostic Techniques	<b>R</b>	1	Xu, Toronov or Douplik
BP8103: Fundamentals of Radiation Physics	<b>R</b>	1	Heath or Pejović-Milić
BP8201: Master's Seminar I	<b>R</b>	Pass/Fail	Program Director
BP8202: Master's Seminar II	<b>R</b>	Pass/Fail	Program Director
One course from elective list	<b>E</b>	1	
<b>Option in Medical Physics</b>			
BP8104: Radiation Therapy	<b>R</b>	1	Heath or adjunct medical physicist
BP8113: Advanced Imaging	<b>R</b>	1	Xu, Toronov or Douplik
BP8107: Radiation Protection and Dosimetry	<b>R</b>	1	Pejović-Milić or Heath
BP8112: Radiobiology	<b>R</b>	1	Adjunct medical physicist
BP8nnn: Anatomy and Physiology for Medical Physicists	<b>R</b>	1	

<b>Elective List</b>	<b>Credits</b>	<b>Faculty member(s) Responsible for teaching</b>
BP8101: Stats for the Health Sciences	1	Escobar
BP8105: Comp Methods in Biomed Phys	1	Kumaradas or Beauchemin
BP8108: Special Topics I	1	Guest or visiting professor
BP8109: Special Topics II	1	Guest or visiting professor
BP8106: Optical, Acoustic and Thermal Physics	1	Kolios, Tavakkoli, Karshafian or Douplik
BP8110: Biomedical Ultrasound	1	Tavakkoli, Kolios or Karshafian
Note: with permission from Supervisor and Program Director, Master's and PhD students may use one graduate course from a relevant program at Ryerson or local Universities in place of one elective.		

The Doctor of Philosophy in the field of Biomedical Physics, Option in Medical Physics comprises of 11 required courses, out of which four are Doctoral Seminar courses, and 2 elective courses, as indicated in Table 2.

Table 2: Degree requirements of Doctor of Philosophy in the field of Biomedical Physics, Option in Medical Physics

<b>Doctor of Philosophy in the field of Biomedical Physics</b>	<b>Required/ Elective</b>	<b>Credits</b>	<b>Faculty member(s) Responsible for teaching</b>
BP9201: Doctoral Seminar I	<b>R</b>	Pass/Fail	Program Director
BP9202: Doctoral Seminar II	<b>R</b>	Pass/Fail	Program Director
BP9203: Doctoral Seminar III	<b>R</b>	Pass/Fail	Program Director

BP9204: Doctoral Seminar IV	<b>R</b>	Pass/Fail	Program Director
BP9101: Science Communication	<b>R</b>	1	Karshafian, Kolios or Pejović-Milić
One course from elective list	<b>E</b>	1	
One course from elective list	<b>E</b>	1	
<b>Option in Medical Physics</b>			
BP8102: Medical Diagnostic Techniques	<b>R</b>	1	Xu, Toronov or Douplik
BP8103: Fundamentals of Radiation Physics	<b>R</b>	1	Heath or Pejović-Milić
BP8104: Radiation Therapy	<b>R</b>	1	Heath or adjunct medical physicist
BP8107: Radiation Protection and Dosimetry	<b>R</b>	1	Pejović-Milić or Heath
BP8112: Radiobiology	<b>R</b>	1	Adjunct medical physicist or Douplik
BP8nnn: Anatomy and Physiology for Medical Physicists	<b>R</b>	1	Faculty member, Chemistry & Biology

<b>Elective List</b>	<b>Credits</b>	<b>Faculty member(s) Responsible for teaching</b>
BP8101: Stats for the Health Sciences	1	Escobar
BP8105: Comp Methods in Biomed Phys	1	Kumaradas or Beauchemin
BP8108: Special Topics I	1	Guest or visiting professor
BP8109: Special Topics II	1	Guest or visiting professor
BP8106: Optical, Acoustic and Thermal Physics	1	Kolios, Tavakkoli, Karshafian or Douplik
BP8110: Biomedical Ultrasound	1	Tavakkoli, Kolios or Karshafian
<p>Note: with permission from Supervisor and Program Director, Master's and PhD students may use one graduate course from a relevant program at Ryerson or local Universities in place of one elective.</p>		

All required and elective courses are already offered to students enrolled in graduate programs in Biomedical Physics at the Ryerson Yeates School of Graduate studies. Only one new graduate course is required, BP8nnn: Anatomy and Physiology for Medical Physicists, and it will be developed and offered by the Department of Chemistry and Biology at Ryerson University.

**Sequence of course offerings of the Master of Science and Doctor of Philosophy in the field of Biomedical Physics with Option in Medical Physics**

Presently in the graduate programs offered by the Department of Physics most courses are offered bi-yearly, thus allowing students access to all courses during their tenure in the graduate programs. The following tables illustrate the proposed sequence of required and elective courses delivery for graduate students enrolled in the Option in Medical Physics entering in even and odd years (Tables 3 to 6).

Table 3: Sample course schedule for Master's student entering in Fall 2013

Fall 2013	Winter 2014	Fall 2014	Winter 2015
BP8201: Master's Seminar I		BP8202: Master's Seminar II	
BP8102: Medical Diagnostic Techniques	BP8nnn: Anatomy and Physiology	BP8112: Radiobiology	BP8104: Radiation Therapy
BP8103: Fndamntls of Radiation Physics	BP8107: Radiation Protection and Dosimetry		BP8113: Advanced Imaging
	(Elective)		(Elective)

Table 4: Sample course schedule for PhD student entering in Fall 2013

Fall 2013	Winter 2014	Fall 2014	Winter 2015
BP9201: Doctoral Seminar I		BP9202: Doctoral Seminar II	
BP8102: Medical Diagnostic Techniques	BP8nnn: Anatomy and Physiology	BP8112: Radiobiology	BP8104: Radiation Therapy
BP8103: Fndamntls of Radiation Physics	BP8107: Radiation Protection and Dosimetry	BP9101: Science Communication	BP8113: Advanced Imaging
	(Elective 1 or 2)		(Elective 1 or 2)

Fall 2015	Winter 2016	Fall 2016	Winter 2017
BP9203: Doctoral Seminar III		BP9204: Doctor Seminar IV	
	(Elective 1 or 2)		

Table 5: Sample course schedule for Master's student entering in Fall 2014

Fall 2014	Winter 2015	Fall 2015	Winter 2016
BP8201: Master's Seminar I		BP8202: Master's Seminar II	
BP8102: Medical Diagnostic Techniques	BP8104: Radiation Therapy	BP8112: Radiobiology	BP8nnn: Anatomy and Physiology
BP8103: Fndamntls of Radiation Physics	BP8113: Advanced Imaging		BP8107: Radiation Protection and Dosimetry
	(Elective)		(Elective)

Table 6: Sample course schedule for PhD student entering in Fall 2014

Fall 2014	Winter 2015	Fall 2015	Winter 2016
BP9201: Doctoral Seminar I		BP9202: Doctoral Seminar II	
BP8102: Medical Diagnostic Techniques	BP8104: Radiation Therapy	BP8112: Radiobiology	BP8nnn: Anatomy and Physiology
BP8103: Fndamntls of Radiation Physics	BP8113: Advanced Imaging		BP8107: Radiation Protection and Dosimetry
	(Elective 1 or 2)		(Elective 1 or 2)

Fall 2016	Winter 2017	Fall 2017	Winter 2018
BP9203: Doctoral Seminar III		BP9204: Doctoral Seminar IV	
BP9101: Science Communication	(Elective 1 or 2)		

**Calendar course descriptions****BP8101: Stats for the Health Sciences**

This course is designed as a first course in biostatistics with emphasis on relevance in biomedical physics applications. Topics include nonparametric statistics, linear regression, errors and structural analysis of linear relationships between variables, nonlinear estimation, survival analysis and multivariate analysis of data. A statistics computer package will be used. 1 Credit

**BP8102: Medical Diagnostic Techniques**

This course will cover a wide variety of contemporary topics in medical imaging including x-ray imaging (production, planar x-ray, fluoroscopy, dual x-ray absorptiometry), computed tomography (CT), functional CT, magnetic resonance imaging (temperature mapping, functional MRI), ultrasound, Doppler techniques, positron emission tomography, bone densitometry, trace element detection and nuclear medicine.

Antirequisite: PCS 405. 1 Credit

**BP8103: Fundamentals of Radiation Physics**

This course is designed for students with an undergraduate background in radiation physics. Topics include the Bohr atomic model, Rutherford scattering, emission of photons, x-ray spectra, Bremsstrahlung and characteristic radiation, homogeneous and heterogeneous photon beams, thin and thick x-ray targets, absorption and scatter of photon beams, beam attenuation, Thomson scattering, Photoelectric effect, Rayleigh scattering, Compton effect, pair production, interactions of neutrons with matter, radiation quantities and units, radiation decay, exposure, kerma, dose, and dose equivalent. 1 Credit

**BP8104: Radiation Therapy**

This course is an introduction to radiation therapy physics, including topics such as radiation teletherapy units; interaction of radiation with tissue; dosimetry of a single beam of x-ray; beam calibration and patient dose calculation; combination of beams and treatment planning, brachytherapy; radiation detection. Prerequisite: BP8103. 1 Credit

**BP8105: Computational Methods in Biomedical Physics**

The course will focus on the use of computational modeling techniques for hypothesis driven investigation of problems in biomedical physics. The student will apply and integrate fundamental knowledge of mathematics, physics and life sciences to design and implement appropriate models and to analyse and interpret simulation results. Emphasis will be placed on simulation methods such as Monte Carlo methods, and finite element and finite difference techniques. 1 Credit

**BP8106: Optical, Acoustic and Thermal Physics**

The course will begin with basic optical, acoustic and thermal propagation in biomaterials. This will be followed by the presentation of the principles of photodynamic therapy, optical sensing, ultrasound biomicroscopy, optoacoustics imaging, thermal therapy and thermography. 1 Credit

**BP8107: Radiation Protection and Dosimetry**

The course will focus on health physics, radiation safety and radiation protection (shielding). Students will learn the essentials of determining radiation doses from internal and external ionizing radiation sources. A survey of sources, applications, risks and control of environmental radiation will be presented. The final part of the course will review microdosimetry. 1 Credit

**BP8108: Special Topics I**

This course examines selected topics in areas related to the program that are not covered by existing courses. The topic(s) will vary depending on the needs and interests of the students and the instructor. The course description will be announced prior to scheduling the course. 1 Credit



**BP8108: Special Topics II**

This course examines selected topics in areas related to the program that are not covered by existing courses. The topic(s) will vary depending on the needs and interests of the students and the instructor. The course description will be announced prior to scheduling the course. 1 Credit

**BP8110: Biomedical Ultrasound**

This course covers the essential elements in the physics of ultrasound and its current applications in medicine and biology. Topics include: physics of ultrasound, linear and non-linear ultrasound field calculations, scattering of ultrasound, ultrasound transducers, ultrasound imaging systems, Doppler ultrasound, and therapeutic ultrasound. 1 Credit

**BP8112: Radiobiology**

Fundamentals of physics and chemistry of radiation interactions, free radicals, oxidation and reduction. Subcellular and cellular effects: killing, repair, sensitization and protection. Measurement methods. Survival curves and their significance. Modification of the radiation response. Tissue effects, genetic and carcinogenic effects, mutations, hazards. Anti-requisite: PCS354. 1 Credit

**BP8113: Advanced Imaging**

This advanced level course will include mathematical methods in imaging science (linear systems and image processing), image reconstruction techniques for CT, cone-beam CT, PET and MRI, and MRI imaging. Image registration, Rose Model, ROC curves, signal-to-noise ratio and DQE will also be discussed. Pre-requisite BP8102 or equivalent. 1 Credit

**BP8nnn: Anatomy and Physiology for Medical Physicists**

An overview of the structure of the main regions of the human body including the thorax, abdomen, bones, brain and central nervous system. Function of respiratory, circulatory, nervous, digestive, urinary and reproductive systems. Anatomical nomenclature and the radiographic appearance of different body regions will be discussed. 1 Credit

**BP8201: Master's Seminar I**

This course consists of weekly seminars with emphasis on current research in the specialization fields and emerging areas of medical physics. This is a two term course (Fall and Winter) in the first year of the program, and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail

**BP8202: Master's Seminar I**

This course consists of weekly seminars with emphasis on current research in the specialization fields and emerging areas of medical physics. This is a two term course (Fall and Winter) in the first year of the program, and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail

**BP9101: Science Communication**

The course is designed for students who are interested in pursuing an academic career as well as those intending to work outside the academic environment after graduating. Specific course goals are to provide graduate students with insight into, and practice in effective means of science communication as well as an awareness of ethical issues in research and professional environments. This will be done through various activities that include writing and reviewing research grant proposals, teaching physics mini-lessons, literature and presentation critiques, manuscript and thesis/dissertation preparation, and oral presentation for a range of audiences (scientist, media, lay audience, school children) and subjects

(including research-related and more general topics). The course is suitable for students in other scientific or engineering disciplines. 1 Credit

**BP9201: Doctoral Seminar I**

This course consists of weekly seminars with emphasis on current research in the specialization fields, and emerging areas of medical physics. This is a two term course (Fall and Winter) in the first year of the Doctoral program, and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail

**BP9202: Doctoral Seminar II**

This course consists of weekly seminars with emphasis on current research in the specialization fields, and emerging areas of medical physics. This is a two term course (Fall and Winter) in the second year of the Doctoral program, and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail

**BP9203: Doctoral Seminar III**

This course consists of weekly seminars with emphasis on current research in the specialization fields, and emerging areas of medical physics. This is a two term course (Fall and Winter) in the third year of the Doctoral program, and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail

**BP9204: Doctoral Seminar IV**

This course consists of weekly seminars with emphasis on current research in the specialization fields, and emerging areas of medical physics. This is a two term course (Fall and Winter) in the fourth year of the Doctoral program, and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail

### **Entrance requirements for the Option in Medical Physics**

Only graduate students enrolled in the Master of Science and Doctor of Philosophy in the field of Biomedical Physics will be considered for enrolment in the Option in Medical Physics. To be consistent with CAMPEP requirements, students entering the Option in Medical Physics must also have a physics or engineering-related background and must have completed a minimum of 3 upper-level physics courses at the undergraduate level. The program director and the admissions committee will assess the background of the applicants at the time of application/transfer to the Option in Medical Physics.

In addition, students wishing to enroll in the Medical Physics Option from the Biomedical Physics graduate programs must do so by the end of their first semester; January starting date is permitted only for PhD students due to the course scheduling.

### **Demand and Availability of Option in Medical Physics**

It is anticipated that the interest in the Option in Medical Physics will be strong due to new requirement imposed by the ABR and CCPM professional societies, as well as the lack of an accredited graduate program in the GTA and Hamilton. Graduate students are required to consult with the Department of Physics Graduate Program Director and their thesis supervisor before commencing courses in the Option in Medical Physics.

All policies and supplemental policies of the existing Master of Science and Doctor of Philosophy in the field of Biomedical Physics will stay in effect for the students selecting the Option in Medical Physics. The Option in Medical Physics is not offered part-time.

### **Implementation of Option in Medical Physics**

The Option in Medical Physics is targeted to begin in Fall 2013 and once the CAMPEP accreditation of the Master of Science and Doctor of Philosophy in the field of Biomedical Physics, Option in Medical Physics is completed. It is important to note that students enrolled in the Master of Science and Doctor of Philosophy in the field of Biomedical Physics will not be graduating from an accredited graduate program, since they will not obtain required knowledge in Medical Physics as specified in Report #197 of the committee of Education and Training of Medical Physicists of the American Association of Physicists in Medicine. Only students enrolled in the Option in Medical Physics will be considered to be graduating from an accredited graduate program.

Implementation of this Option would not require new faculty positions contingent upon the faculty hire, with expertise in Medical Imaging, approved by the Board of Governors in 2010 for the launching of the PhD program in Physics. Resources on space, library, and computers are adequate if these requirements outlined and approved in the PhD brief are followed through. Changes in the current graduate student funding formula are not also foreseen. Furthermore, changes in the enrolment targets (10 Master and 5 Doctoral students) are not anticipated at this time. If interest in the Master of Science and Doctor of Philosophy in the field of Biomedical Physics, Option in Medical Physics dramatically increases, the programs will work with the Yeates School of Graduate Studies at Ryerson University to adjust the enrolment targets to accommodate higher demand.

**Appendix A:** Support letter of Dr. M Lachemi, Dean, Faculty of Engineering, Architecture and Science



OFFICE OF THE DEAN  
FACULTY OF ENGINEERING, ARCHITECTURE AND SCIENCE

March 1, 2012

Dr. Chris Evans  
Vice Provost, Academic  
Chair, Academic Standards Council

**Re: Proposed Option in Medical Physics for the Master of Science and Doctor of  
Philosophy in the field of Biomedical Physics**

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Dear Chris,

I am writing to express my support for the development of an option in medical physics for the Master of Science and Doctor of Philosophy degrees in the field of biomedical physics. Having reviewed the proposal, I feel that the document makes a strong case for both the societal need and viability of the option.

The Faculty of Engineering, Architecture and Science recognizes the importance of the dynamic field of medical physics in today's world. Medical physicists help to ensure that medical conditions are properly diagnosed and treated. The proposed option would truly complement our current biomedical physics graduate programs, and is likely to be quite popular amongst our students. Furthermore, I am confident that the impressive level of scholarship of the core faculty in the Department of Physics is more than sufficient to offer the proposed option.

Based on the above, I strongly support the development and implementation of the proposed option in medical physics for the Master of Science and Doctor of Philosophy degrees in the field of biomedical physics.

Sincerely,

A handwritten signature in blue ink, appearing to read "M. Lachemi".

Dr. Mohamed Lachemi, P.Eng., FCAE, FCSCE  
Dean  
Faculty of Engineering, Architecture and Science