OPEN SESSION

4:00 Consent Agenda

Motion: That Senate approve or receive for information by consent items 1-4 [below].

1. Approval of the October 18, 2010 Minutes [enclosed]  
   Decision

2. Report of the Chair
   a. Recognition and Commendation  
      2, A1  
      Information

3. Reports from the Faculties and Conrad Grebel University College  
   2, A2-A20  
   Information

4. Other Business
   a. Conferral of Degrees  
      2, A21-A22  
      Information
   b. COU Report  
      2, A23-A25  
      Information
   c. Graduate & Research Council Appointment  
      2, A26  
      Decision

Regular Agenda

5. Business Arising from the Minutes
   4:05 a. Annual Performance Indicators [full document at: analysis.uwaterloo.ca/docs/pi.php]  
      2  
      Information

   2  
   Information

7. Undergraduate Student Financial Aid and Scholarships  
   2, A27-A33  
   Information

8. Report of the Chair
   a. Environmental Scan  
      2  
      Information

   2  
   Information

10. Report of the Vice-President, External Relations  
    2  
    Information

11. Report of the Vice-President, University Research  
    2  
    Information

12. Reports from Councils
   a. Graduate & Research [Attachment 2 enclosed]  
      2, A34-A75  
      Decision/Information
   b. Undergraduate  
      2, A76-A106  
      Decision/Information

13. Other Business
   a. Delegation of Authority to the Executive Committee  
      3, A107  
      Decision
   b. December Meeting of Senate  
      3  
      Information

CONFIDENTIAL SESSION

5:55 14. Approval of the October 18, 2010 Minutes [enclosed]  
     Decision

6:00 15. Report of the Nominating Committee for Honorary Degrees  
      4, CS1-CS6  
      Decision

LC:tadlNovember 2, 2010

Lois Claxton, Secretary of the University
The Executive Committee met on November 1, 2010 and wishes to report as follows:

**OPEN SESSION**

**Consent Agenda**

2. **REPORT OF THE CHAIR**
   Recognition and Commendation. The committee agreed to forward this report to Senate for information.

3. **REPORTS FROM THE FACULTIES AND CONRAD GREGEBEL UNIVERSITY COLLEGE**
The committee agreed to forward these reports to Senate for information.

4. **OTHER BUSINESS**
   Conferral of Degrees. The committee agreed to forward this list of graduates to Senate for information.

   **COU Report.** The committee agreed to forward this report to Senate for information.

   **Graduate & Research Council Appointment.** The committee agreed to recommend this appointment to Senate for approval.

**Regular Agenda**

5. **BUSINESS ARISING FROM THE MINUTES**
   Annual Performance Indicators. At the request of a senator, brought back to Senate for “full discussion.” The director of Institutional Analysis & Planning will provide a fuller discussion on the indicators, addressing, in particular, the percentage of female hires and noting the different ways faculty are counted.

6. **REVIEW OF THE FUAC/UW RELATIONSHIP**
The principal of Renison University College will speak to this item.

7. **UNDERGRADUATE STUDENT FINANCIAL AID AND SCHOLARSHIPS**
The registrar will speak to this item.

8. **REPORT OF THE CHAIR**
   Environmental Scan. The chair will report as appropriate.

9. **REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST**
The provost will report as appropriate.

10. **REPORT OF THE VICE-PRESIDENT, EXTERNAL RELATIONS**
The vice-president will report as appropriate.

11. **REPORT OF THE VICE-PRESIDENT, UNIVERSITY RESEARCH**
The vice-president will report as appropriate.

12. **REPORTS FROM COUNCILS**
   Graduate & Research. The committee agreed to forward this report to Senate for approval and information as indicated.

   Undergraduate. The committee agreed to forward this report to Senate for approval and information as indicated.
13. OTHER BUSINESS

Delegation of Authority. The committee agreed to recommend this motion to Senate for approval.

December Meeting of Senate. Although there currently appears to be insufficient agenda to warrant a December meeting of Senate, provided Senate approves the Delegation of Authority above, the Executive Committee will meet and advises Senate to hold its December meeting date. The secretary will advise the Executive Committee within a week of its December meeting whether a meeting of Senate is warranted and Senate will be so advised.
Recognition and Commendation

David Rudolph, professor of earth sciences and director of the Water Institute, has received the National Ground Water Association’s 2010 M. King Hubbert Award “for major science contributions to the knowledge of groundwater.” The award will be presented on December 8 at NGWA’s annual meeting in Las Vegas. Says the association: “In addition to being an educator, Rudolph has conducted extensive research broadly based on groundwater resources, with major focus on the protection of groundwater resources, groundwater contamination/remediation from agricultural sources, vadose zone processes, and the mechanisms of groundwater recharge. Since 1990, he has authored or co-authored more than 50 papers in refereed journals, more than 40 papers in refereed conference proceedings, and about 100 conference presentations — amounting to about 10 publications of various forms a year. Rudolph also is known for his balanced teaching which combines sound theoretical foundations with practical applications in the lab and in the field.”

“On recognition of efforts throughout her career at Waterloo to foster opportunities for women in the discipline of statistics,” Mary Thompson, former dean of mathematics, university professor and professor emeritus in statistics & actuarial science, was presented with the Elizabeth L. Scott award for 2010 at the Joint Statistical Meetings held in the summer in Vancouver. “The award honours the lifelong efforts of Elizabeth L. Scott to further the careers of women in academia. Professor Scott was an astronomer by training who worked with Professor Jerzy Neyman in the Statistical Laboratory at Berkeley during World War II. She had a long, distinguished career as a professor at Berkeley and worked in a variety of areas besides astronomy, including experimental design, distribution theory, and medical statistics. Later in her career, Dr. Scott became concerned about salary inequities between men and women in academia, and published several papers on this topic.”

Waterloo student Siaw Yun Poi is a recipient of the Actuarial Foundation’s John Culver Wooddy Scholarship. Poi, who was awarded $2,000, joins 12 other students from around the world recognized with this prestigious scholarship. “The John Culver Woddy Scholarship is awarded annually to college seniors who have successfully completed at least one actuarial examination, rank in the top quartile of their class and are nominated by a professor at their school.” The Actuarial Foundation was established in 1994 “to help facilitate and broaden the actuarial profession’s contribution to society. The mission of the Foundation is to develop, fund and execute education and research programs that serve the public by harnessing the talents of actuaries.”
FOR INFORMATION

A. APPOINTMENTS

Definite-term Appointment
GUINDON, Emmanuel, Research Assistant Professor, Propel Centre for Population Health Impact, Faculty of Applied Health Sciences, October 1, 2010 - September 30, 2013. [Bachelor of Arts, Economics and Management, McGill University, 1995; Master of Arts, Economics, University of Victoria, 1998; PhD, Health Research Methodology, McMaster University, 2010. “As a Propel Scientist, Guindon will focus on the economics of tobacco control and tax avoidance. He will be involved in research and knowledge exchange activities to further Propel’s strategic plan. He will be conducting research that contributes to improvements in chronic disease prevention and care at a population level, providing opportunities in population based research for graduate students and postdoctoral fellows through training programs and support.”]

Definite-term Reappointment
WARD, Glenn, Lecturer, Department of Health Studies & Gerontology, September 1, 2010 to August 31, 2011.

Visiting Appointment
DEJANOVIC, Aleksandar, Visiting Researcher, Department of Kinesiology, September 1, 2010 to December 23, 2010.

Adjunct Appointments

Undergraduate Instruction
RAFFERTY, Zara, Lecturer, Department of Recreation & Leisure Studies, January 1, 2011 to April 30, 2011.

Research and Graduate Supervision
PEARCE, Nancy, Assistant Professor, Department of Health Studies & Gerontology, January 1, 2011 to December 31, 2014.

Graduate Student to Part-time Lecturer Appointments
ARMSTRONG, Joshua, Lecturer, Department of Health Studies & Gerontology, September 1, 2010 to December 31, 2010.

NEUFELD, Eva, Lecturer, Department of Health Studies & Gerontology, January 1, 2011 to April 30, 2011.

Postdoctoral Fellow to Part-time Lecturer Appointment
GILLIES, Jennifer, Lecturer, Department of Recreation & Leisure Studies, October 1, 2010 to September 30, 2011.

Susan J. Elliott
Dean, Applied Health Sciences
A. APPOINTMENTS

**Probationary-term Appointment**

WHITE, Katherine (BA, Cornell University, 1999; PhD, Brown University, 2007), Assistant Professor, Department of Psychology, January 1, 2010 to June 30, 2013. Following a two-year Post-Doctoral Fellowship at the University of Rochester, White came to the University of Waterloo in January 2010 to join the Developmental Division in the Department of Psychology. Her area of research is the development of language in *infants*, with particular attention to the speech perception and language acquisition in bilinguals. Since arriving at Waterloo, White has established her infant laboratory, admitted a first-year graduate student, and already has a ‘waiting list’ of several undergraduates who want to volunteer as Research Assistants in her lab! This past Spring Term she taught Psychology 320 (Language Development) to 100 students—and received an outstanding course evaluation. White has gotten off to a great start at Waterloo and, clearly, following the recent retirements of two senior members of our Developmental Division, she has become a critical addition to our small, but rebuilding Division of Developmental Psychology.

**Definite-term Appointments**

DUSAILLANT-FERNANDES, Valérie (D.E.U.G. Université Paris III, 1988; MA, UW, 2004; PhD, UoT, 2010), Lecturer, Department of French Studies, September 1, 2010 to August 31, 2011. Dusaillant-Fernandes studied, in her Ph.D. dissertation, how childhood traumatic events are described and imbedded in women writer autobiographic novels. She also worked on French writers Sylvie Germain and Amélie Nothomb. Our new colleague brings to our department her expertise on French women writers from the 20\(^{th}\) and 21\(^{st}\) centuries, and also a strong teaching experience in Ontario French departments (UW, WLU, Guelph and UoT).

LEPAGE, Élise (Licence, Université Grenoble 3, 2003; MA, Université Lyon 2, 2005; PhD, UBC, 2010), Lecturer, Department of French Studies, September 1, 2010 to August 31, 2011. In her PhD dissertation, entitled “Géographie des confins”, Lepage examines the different relationships between space and literature in the works of three French Canadian writers (Pierre Morency, Pierre Nepveu and Louis Hamelin). She taught at UBC and was assistant professor, last year, at the Collège universitaire Saint-Boniface.

SORGE, Antonio (BA, McGill University, 1997; MA Carleton University, 1999; PhD, University of Calgary, 2007), Assistant Professor, Department of Anthropology, August 1, 2010 to July 31, 2012. Sorge joins the Department of Anthropology as a cultural anthropologist, specializing in cultural identity and comparative studies of masculinity, examining questions pertaining to honour-based forms of violence, the dynamics of illegal organizations such as mafia and street gangs, and is currently developing expertise in questions pertaining to global terrorism and the NATO-led “war on terror.” His geographic areas of expertise include Europe and the Mediterranean, particularly Sardinia and Sicily. He comes to us from the University of Prince Edward Island, where he held a limited-term contract position for four years. He has also taught as a sessional appointment at the University of Calgary, receiving excellent student evaluations in both places. He has taught a broad range of courses at all levels, including Native Canadians, Anthropology of Religion, Political Anthropology, Urban Anthropology, Violence and Honour, and Field Methods. His work has been published in the *Journal of the Society for the Anthropology of Europe*, the *Journal of the Royal Anthropological Institute*, and
elsewhere. He has a book under review on his research on Sardinia, titled “The Free Highlands: History, Violence, and Memory in Sardinia,” and is developing an edited volume on the face-to-face community as a unit of analysis in anthropology, titled “Resiting the Village: Place and Locality in Anthropological Practice.” His is an important contribution to our undergraduate program and to the graduate program in Public Issues Anthropology.

VIDEKANIC, Bojana (BFA, Concordia University, 2001; MA, York University, 2003; PhD candidate in the Department of Social & Political Thought, York University), Lecturer, July 1, 2010 to June 30, 2011. Videkanic brings to the department an expertise in 20th century Modernist art and culture under Socialist rule. She has taught for many years at the Ontario College of Art and Design and York University. Her courses range from visual culture theory, Eastern European Modernist art history, various art history themed courses, to specialized courses in art and ESL learning. She also has experience with telepresence courses. Videkanic’s experience and academic background in Art History, Visual Culture and Studio fit well with the academic mandate of the Department of Fine Art and broaden our course offerings in these complementary areas.

Adjunct Appointments

Instruction

KERFOOT, Alicia, Lecturer, Department of English Language & Literature, January 1, 2011 to April 30, 2011.

LEONE, Roberto, Lecturer, Department of Political Science, September 1, 2010 to December 31, 2010.

STUART, Heather, Lecturer, Department of English Language & Literature, January 1, 2011 to April 30, 2011.

ZARNOW, Leandra, Lecturer, Department of History, January 1, 2011 to April 30, 2011.

Miscellaneous (research, consultations, etc.)

HEINTZMAN, John David, Psychiatrist, Department of Psychology, September 1, 2010 to August 31, 2011.

Adjunct Reappointments

Instruction

ARNASON, Mark, Lecturer, School of Accounting & Finance, September 1, 2010 to December 31, 2010.

BENNETT, Stephen, Lecturer, Department of English Language & Literature, January 1, 2011 to April 30, 2011.

CORRIGAN, Alan, Lecturer, Department of English Language & Literature, January 1, 2011 to April 30, 2011.

HUTTER, Daniel, Lecturer, Department of Classical Studies, January 1, 2011 to April 30, 2011.

KROEKER, Ronald, Assistant Professor, Department of Classical Studies, January 1, 2011 to April 30, 2011.

LANGILL, Judy, Lecturer, Department of English Language & Literature, January 1, 2011 to April 30, 2011.
MAART, Rozena, Lecturer, Department of English Language & Literature, January 1, 2011 to April 30, 2011.

OLDHAM, Andrew, Lecturer, School of Accounting & Finance, September 1, 2010 to December 31, 2010.

PACI, Tim, Lecturer, Faculty of Arts, January 1, 2011 to April 30, 2011.

SPIELMACHER, Mark, Lecturer, Department of English Language & Literature, January 1, 2011 to April 30, 2011.

Graduate Supervision
HOWARD, Michael (Distinguished Professor Emeritus), Professor, Department of Economics, September 1, 2010 to June 30, 2011.

KEEPING, Lisa, Associate Professor, Department of Psychology, September 1, 2010 to August 31, 2011.

Miscellaneous (research, consultations, etc.)
STINSON, Danu, Research Associate, Department of Psychology, September 1, 2010 to August 31, 2011.

Graduate Student to Part-time Lecturer Appointment
FINN, Tracy, Department of Philosophy, September 1, 2010 to December 31, 2010.

B. ADMINISTRATIVE APPOINTMENTS
BIRD, Fred, Associate Chair, Graduate Studies, Department of Political Science, September 1, 2010 to August 31, 2011.

SIMPSON, Jennifer, Interim Chair, Department of Drama & Speech Communication, October 1, 2010 to June 30, 2011.

C. RETIREMENTS
BURT, Sandra, Associate Professor, Department of Political Science, effective January 1, 2011.

BUYERS, Jane, Professor, Department of Fine Arts, effective July 1, 2010.

CURCHIN, Leonard, Associate Professor, Department of Classical Studies, effective January 1, 2011.

ENGLISH, John, Professor, Department of History, effective November 1, 2009.

HOLMES, Richard, Associate Professor, Department of Philosophy, effective January 1, 2010.

KOROVKIN, Tanya, Professor, Department of Political Science, effective September 1, 2010.

KUMAR, Ramesh, Professor, Department of Economics, effective September 1, 2010.

LYONS, Harriet, Professor, Department of Anthropology, effective January 1, 2011.

RUSSELL, Delbert, Professor, Department of French Studies, effective January 1, 2010.
SOCKEN, Paul, Professor, Department of French Studies, effective September 1, 2010.

WESTHUES, Kenneth, Professor, Department of Sociology & Legal Studies, effective January 1, 2011.

WOOLSTENCROFT, Peter, Associate Professor, Department of Political Science, effective May 1, 2010.

ZELLER, Anne, Professor, Department of Anthropology, effective January 1, 2010.

D. SABBATICAL

Approved by the Board of Governors

MUSZYNSKI, Alicja, Associate Professor, Department of Sociology & Legal Studies, July 1, 2011 to June 30, 2012 at full salary.

Ken S. Coates
Dean, Faculty of Arts
FOR INFORMATION

A. APPOINTMENTS

Probationary-term Appointments

ABUKHDEIR, Nasser M., Assistant Professor, Department of Chemical Engineering, May 16, 2011 – June 30, 2014. PhD McGill University 2009; MChE Carnegie Mellon University 2002; BS Carnegie Mellon University Chemical Engineering 2002; BS Carnegie Mellon University Computer Science 2002. Abukdheir is currently a postdoctoral fellow in Chemical Engineering at the University of Delaware and prior to that worked as a Manufacturing Engineer for Merck and Co. His research interests focus on the use of multi-scale modeling and simulation of functional materials. The applications are to high-order liquid crystalline materials, block copolymer films and to studies of convolution formation in the mammalian cerebral cortex.

RICARDEZ-SANDOVAL, Luis A., Assistant Professor, Department of Chemical Engineering, January 1, 2011 – June 30, 2014. PhD University of Waterloo 2008; MSc Instituto Tecnologico de Celaya, Celaya, Guanajuato, Mexico 2000; BA Instituto Tecnologico de Orizaba, Orizaba, Veracruz, Mexico 1997. Before coming to Waterloo to study for his PhD, Ricardez-Sandoval worked for the Mexican Petroleum Institute. His research interests are in the areas of (1) integration of design and control of dynamic systems under uncertainty, (2) the application of process control techniques to macro-, micro- and nano-systems and (3) modeling and simulation of multi-scale systems.

TRIPP, Bryan, Assistant Professor, Department of Systems Design Engineering, September 1, 2011 – June 30, 2014. PhD University of Waterloo 2009; MSc University of Toronto 2002; BSc University of Waterloo 1997. Tripp will be joining the Department of Systems Design Engineering in the area of Theoretical Neuroscience. He is leaving a postdoctoral position at McGill University researching variability in the neural code of primates related to motion perception.

Definite-term Appointment

SCOTT, Andrea, Assistant Professor, Department of Systems Design Engineering, September 1, 2011 – August 31, 2014. PhD University of Waterloo 2008; MASc McMaster University 2001; BASc University of Waterloo 1999. Scott will be jointing the Department of Systems Design Engineering in the areas of Thermodynamics and Fluid Mechanics. She brings a strong background in mechanical engineering and data assimilation experience from her postdoctoral fellowship with Environment Canada.

Definite-term Reappointment

NESPOLI, Oscar, Lecturer, Department of Mechanical & Mechatronics Engineering, January 1, 2011 – December 31, 2012. PhD Queen’s University 1991; MASc University of Waterloo 1984; BSc Queen’s University 1981.

Visiting Appointments

CHEN, Le, Scholar, Department of Electrical & Computer Engineering, September 1, 2010 – August 31, 2011.
KHOSROSHAHI, Mohammad, Scholar, Department of Mechanical & Mechatronics Engineering, September 1, 2011 – August 31, 2012.

LI, Jing, Scholar, Department of Chemical Engineering, December 1, 2010 – November 30, 2011.

SINGH SURI, Gurprett, Scholar, Department of Chemical Engineering, February 15, 2011 – July 15, 2011.

SIRIWONGSARN, Ekaphol, Scholar, Department of Chemical Engineering, September 16, 2010 – April 30, 2011.

ZHU, Shomin, Scholar, Department of Chemical Engineering, October 7, 2010 – October 6, 2011.

Visiting Reappointments


RAMZAN, Muhammad, Scholar, Department of Chemical Engineering, November 1, 2010 – December 31, 2010.

SONG, Dana, Scholar, Department of Electrical & Computer Engineering, September 1, 2010 – December 31, 2010.

STEFANOWICZ-PIETA, Izabela, Scholar, Department of Chemical Engineering, September 1, 2010 – August 31, 2011.

Adjunct Appointments

Instruction

BROEDERS, Edward, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

BRUSCOLI, Beatrice, Associate Professor, School of Architecture, September 1, 2010 – December 31, 2010.

DEMAN, Andrew, Lecturer, Department of Systems Design Engineering, January 1, 2011 – April 30, 2011.

FERGUSON, John, Assistant Professor, Department of Civil & Environmental Engineering, January 1, 2011 – April 30, 2011.

HUNT, Brian, Associate Professor, School of Architecture, September 1, 2010 – December 31, 2010.

JACKSON, Tim, Lecturer, Conrad Centre for Business, Entrepreneurship and Technology, September 1, 2010 – June 30, 2011.

KRILIC, Nevena, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

LIEBERMAN, David, Associate Professor, School of Architecture, September 1, 2010 –
December 31, 2010.

**LIM TUNG, Fiona**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

**NAKAMURA, Hajime**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

**PATTERSON, Duncan**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

**POROVIC, Jelena**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

**ROBINSON, Mary**, Lecturer, Department of Chemical Engineering, September 1, 2010 – December 31, 2010.

**TAYLOR, Victoria**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

**TOWN, Chloe**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

**TAYONA, Nova**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

**WONG, Chris**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

**ZEPF, Diana**, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

*Graduate Supervision*

**DINCER, Ibrahim**, Professor, Department of Mechanical & Mechatronics Engineering, June 1, 2010 – May 31, 2015.

**DOUGLAS, Robert**, Professor, Department of Civil & Environmental Engineering, September 1, 2010 – August 31, 2012.

*Graduate Supervision and Research*

**ANJOS, Miguel**, Associate Professor, Department of Management Sciences, September 1, 2010 – August 31, 2013.

**KAISER, Peter**, Professor, Department of Civil & Environmental Engineering, September 1, 2010 – August 31, 2012.

**KOSHAK, Nabeel**, Professor, Department of Civil & Environmental Engineering, October 1, 2010 – September 30, 2012.

*Research*

**RAVICHANDRAN, Thamirajah**, Assistant Professor, Department of Systems Design Engineering, October 1, 2010 – September 30, 2013.
Other


Adjunct Reappointments

Instruction

PRZYBYLSKI, Maya, Assistant Professor, School of Architecture, September 1, 2010 – December 31, 2010.

Graduate Supervision

YEE, Eugene, Professor, Department of Mechanical & Mechatronics Engineering, October 1, 2010 – September 30, 2014.

Instruction, Graduate Supervision and Research

FADER, Christina, Associate Professor, Department of Management Sciences, September 1, 2010 – August 31, 2013.

Research

ARIARATNAM, Ariam (Professor Emeritus), Professor, Department of Civil & Environmental Engineering, October 2, 2010 – October 1, 2013.

Other

ROE, Peter, Director, Exchange Program, Engineering Undergraduate Office, October 1, 2010 – September 30, 2011.

Graduate Student to Part-time Lecturer Appointments

IZADPANAH, Pedram, Department of Civil & Environmental Engineering, January 1, 2011 – April 30, 2011.

MENESI, Wail, Department of Civil & Environmental Engineering, January 1, 2011 – April 30, 2011.

MOHAMMADZADEH, Omidreza, Department of Chemical Engineering, January 1, 2011 – April 30, 2011.


B. ADMINISTRATIVE APPOINTMENTS

CANIZARES, Claudio, Hydro One Chair, Department of Electrical & Computer Engineering, May 1, 2010 – April 30, 2015.

EL-SAADANY, Ehab, Director, Electrical Power Engineering Program, Department of Electrical & Computer Engineering, September 1, 2010 – August 31, 2011.

FIEGUTH, Paul, Chair, Department of Systems Design Engineering, September 20, 2010 – August 31, 2013.
C. RESIGNATIONS
ANJOS, Miguel, Associate Professor, Department of Management Sciences, August 31, 2010.


D. DEATH
COCKFIELD, Richard (Professor Emeritus), Adjunct Professor, Department of Civil & Environmental Engineering, October 13, 2010.

E. SABBATICALS
For Approval by the Board of Governors
FU, Liping, Professor, Department of Civil & Environmental Engineering, January 1, 2011 – June 30, 2011 at 100% salary.

HELLINGA, Bruce, Professor, Department of Civil & Environmental Engineering, January 1, 2011 – June 30, 2011 at 100% salary.

Adel Sedra
Dean, Faculty of Engineering
FOR INFORMATION

A. APPOINTMENTS

Tenured

NEPAL, Sanjay, Associate Professor, Department of Geography & Environmental Management, January 1, 2011: PhD, University of Bern, 1999; MSc, AIT, Thailand, 1991; MA, Tribhuvan University, 1984. Nepal is widely known for his research on the social aspects of conservation geographies in developing nations and tourism impacts in natural areas and remote communities. The department sees this appointment as an opportunity to build on its tourism research strengths and Nepal’s background nicely complements the existing expertise within the department and the Tourism program.

Probationary-term Reappointments

LEWIS, Geoffrey, Assistant Professor, School of Planning (60%) and School of Environment, Enterprise & Development (40%), July 1, 2011 to June 30, 2014: PhD, University of Michigan (Ann Arbor), 2006; MSc Architecture, University of Michigan, 2001; MS Natural Resources, University of Michigan, 1994; BS, Rensselaer Polytechnic Institute, 1983.

QIAN, Zhu (Joe), Assistant Professor, School of Planning, July 1, 2011 to June 30, 2014: PhD, Texas A&M University, 2008; MA, University of British Columbia, 2002; B.Arch, Tongji University (China), 1996.

VINODRAI, Tara, Assistant Professor, Department of Geography & Environmental Management (51%) and School of Environment, Enterprise & Development (49%), July 1, 2011 to June 30, 2014: PhD, University of Toronto, 2005; MA, Queen’s University, 1998; BA Hons, Queen’s University, 1996.

Adjunct Appointments

Instruction

CHEON, Jaehyun, Lecturer, School of Planning, September 1, 2010 to December 31, 2010.

FORD, Victoria, Lecturer, School of Environment, Enterprise & Development, January 1, 2011 to April 30, 2011.

MORTSCH, Linda, Assistant Professor, Department of Geography & Environmental Management, July 1, 2010 to June 30, 2013.

PHAN, Thang Chau, Assistant Professor, School of Environment, Enterprise & Development, January 1, 2011 to April 30, 2011.

ROOTS, Amy, Lecturer, School of Planning, September 1, 2010 to December 31, 2010.

SMITH, Nancy, Associate Professor, School of Planning, January 1, 2011 to April 30, 2011.

Graduate Supervision/Committee Membership

MORTSCH, Linda, Assistant Professor, Department of Geography & Environmental Management, July 1, 2010 to June 30, 2013.
Research
MORTSCH, Linda, Assistant Professor, Department of Geography & Environmental Management, July 1, 2010 to June 30, 2013.

Cross Appointments
McKILLOP, Ian, Associate Professor, Department of Health Studies & Gerontology and School of Computer Science to the School of Planning, May 1, 2010 to April 30, 2013.

SMALE, Bryan, Professor, Department of Recreation & Leisure Studies to the Department of Geography & Environmental Management, January 1, 2010 to December 31, 2013.

Change in Appointment
McCARTHY, Daniel, Assistant Professor, transfer from the Centre for Knowledge Integration to the School of Environment, Enterprise & Development (49%), effective September 1, 2010. Professor McCarthy’s home department remains Environment & Resource Studies (51%).

B. ADMINISTRATIVE REAPPOINTMENTS
YOUNG, Steven, Interim Director, School of Environment, Enterprise & Development, July 1, 2010 to June 30, 2011.

YOUNG, Steven, Director, Environment and Business Program, School of Environment, Enterprise & Development, September 1, 2010 to June 30, 2013.

C. SABBATICALS
Approved by the Board of Governors
KHIRFAN, Luna, Assistant Professor, School of Planning, January 1, 2011 to June 30, 2011 at full salary.

VINODRAI, Tara, Assistant Professor, Department of Geography & Environmental Management, January 1, 2011 to June 30, 2011 at full salary.

M. Seasons
Dean
University of Waterloo
REPORT OF THE DEAN OF MATHEMATICS TO SENATE
November 15, 2010

FOR INFORMATION

A. APPOINTMENTS

Visiting Appointments
RAHMAN, Mohammad Ziaur, Research Associate, David R. Cheriton School of Computer Science, October 1, 2010 – September 30, 2011.


WANG, Weihong, Researcher, David R. Cheriton School of Computer Science, October 1, 2010 – March 31, 2011.

Adjunct Reappointments
Research
HOFFMAN, Peter (Professor Emeritus), Professor, Dept. of Pure Mathematics, September 1, 2010 – August 31, 2013.

OLIVEIRA, Toacy, Assistant Professor, David R. Cheriton School of Computer Science, October 1, 2010 – September 30, 2013.


Cross Appointments

COLEMAN, Thomas, Professor, Dept. of Combinatorics & Optimization to the Dept. of Applied Mathematics, September 1, 2010 – August 31, 2015.

Postdoctoral Fellow to Part-time Lecturer Appointments


GEORGIOU, Konstantinos, Dept. of Combinatorics & Optimization, September 1, 2010 – August 31, 2011.

B. ADMINISTRATIVE APPOINTMENT

VANDERBURGH, Ian, Director, Centre for Education in Mathematics and Computing, July 1, 2011 – June 30, 2014.

C. RESIGNATION

HARVEY, Nicholas, Assistant Professor, Dept. of Combinatorics & Optimization, effective June 30, 2011.
D. SABBATICAL
For Approval by the Board of Governors
POULIN, Francis, Assistant Professor, Dept. of Applied Mathematics, January 1, 2011 – June 30, 2011 with 100% salary.

Ian P. Goulden
Dean
FOR INFORMATION

A. APPOINTMENTS

Adjunct Reappointments

Graduate Supervision and Research

MAGOSKI, Neil S., Associate Professor, Department of Biology, December 1, 2010 to November 30, 2013.

STEPHENSON, Gladys L., Professor, Department of Biology, December 1, 2010 to November 30, 2013.

ZHAO, Yingming, Assistant Professor, Department of Biology, December 1, 2010 to November 30, 2013.

Undergraduate Instruction

LANG, Jane, Lecturer, Department of Earth & Environmental Sciences, September 1, 2010 to December 31, 2010.

SHANKAR, Sunita, Lecturer, School of Optometry, September 1, 2010 to December 31, 2010.

STARK, Angela, Assistant Professor, School of Pharmacy, June 1, 2010 to December 31, 2010.

Cross Appointment

CORY, David, Professor, Department of Chemistry, cross appointed to Department of Physics & Astronomy, June 1, 2010 to May 31, 2013.

Cross Reappointment

JOSEPH, Jamie, Assistant Professor, School of Pharmacy, cross appointed to Department of Biology, December 1, 2010 to November 30, 2013.

LEGGE, Raymond, Professor, Department of Chemical Engineering, cross appointed to Department of Biology, November 1, 2010 to October 31, 2013.

Change in Appointment

PUSHIN, Dmitry, Research Assistant Professor, Department of Physics & Astronomy (Institute for Quantum Computing), appointment date changed from August 1, 2010 to July 31, 2015 to September 15, 2010 to September 14, 2015.

Graduate Student to Part-time Lecturer Appointment

PEHME, Peeter, Lecturer, Department of Earth & Environmental Sciences, September 1, 2010 to December 31, 2010.

B. ADMINISTRATIVE REAPPOINTMENT

STRIKKLAND, Donna, Associate Chair, Department of Physics & Astronomy, September 1, 2010 to August 31, 2013.
C. SABBATICALS

For Approval by the Board of Governors

BOLS, Niels, Professor, Department of Biology, September 1, 2011 to February 28, 2012, 100% salary arrangement.

NAZAR, Linda, Professor, Department of Chemistry, January 1, 2011 to June 30, 2011, 100% salary arrangement.

T.B. McMahon
Dean
For Information:

A. Appointments:

Adjunct Appointments for Undergraduate Studies

Jennifer Ball, Lecturer in Peace and Conflict Studies, January 1, 2011 to April 30, 2011
Carol Bauman, Lecturer in Music, September 1, 2010 to April 30, 2011
Ben Bolt-Martin, Ensemble Instructor, September 1, 2010 to April 30, 2011
John Brownell, Lecturer in Music, September 1, 2010 to April 30, 2011
Nancy Kidd, Ensemble Instructor, September 1, 2010 to April 30, 2011
Stephanie Kramer, Lecturer in Music and Ensemble Instructor, September 1, 2010 to April 30, 2011
Debra LaCoste, Lecturer in Music, September 1, 2010 to April 30, 2011
Cam McKittrick, Lecturer in Music, September 1, 2010 to December 31, 2010
Sylvia McMechan, Lecturer in Peace and Conflict Studies, January 1, 2011 to April 30, 2011
Carolyn Mullin, Lecturer in Music, January 1, 2011 to April 30, 2011
Kim Nikkel, Ensemble Instructor, January 1, 2011 to April 30, 2011
Judah Oudshoorn, Lecturer in Peace and Conflict Studies, September 1, 2010 to April 30, 2011
Betty Pries, Lecturer in Peace and Conflict Studies, September 1, 2010 to April 30, 2011
David Schweitzer, Lecturer in History, September 1, 2010 to April 30, 2011
Richard Shields, Lecturer in Peace and Conflict Studies, September 1, 2010 to December 30, 2010
Sandy Thorburn, Lecturer in Music, September 1, 2010 to April 30, 2011

Matthew Vander Vennen, Lecturer in Peace and Conflict Studies, September 1, 2010 to December 31, 2010

Michael Wood, Ensemble Instructor, September 1, 2010 to April 30, 2011

Simon Wood, Lecturer in Music, January 1, 2011 to April 30, 2011

Adjunct Appointments in Graduate Instruction

Brice Balmer, Lecturer in Theological Studies, January 1, 2011 to April 30, 2011

Marianne Mellinger, Lecturer in Theological Studies, July 1, 2010 to June 30, 2011

Susan Steiner, Lecturer in Theological Studies, January 1, 2011 to April 30, 2011

Adjunct Appointments in Graduate Supervision

Peter Erb, Thesis Supervisor, September 1, 2010 to December 31, 2010

Music Studio Instructors

Ben Bolt-Martin, cello
Joseph Castello, trombone
Barbara Kaplanek, flute
Stephanie Kramer, voice
Linda Melsted, violin
Willem Moolenbeek, saxophone
Catherine Robertson, piano
Elaine Sweeney, clarinet
Dave Thompson, guitar
Magdelena Timsinska, guitar
Christine Vlajk, viola
Michael Wood, percussion
B. **Sabbatical Leaves**

**Ken Hull**, Associate Professor of Music, January 1, 2011 to July 30, 2011

**James Pankratz**, Dean, July 1, 2010 to December 31, 2010

**Hildi Froese Tiessen**, Professor of English and Peace and Conflict Studies, July 1, 2010 to December 31, 2010

**Carol Ann Weaver**, Associate Professor of Music, January 1, 2011 to July 30, 2011

Henry Paetkau, President

Marlene Epp, Acting Dean
Memo

To: Lois Claxton
From: Ken Lavigne, Registrar
Date: October 28, 2010
Re: Conferral of Degrees

Following is a list of graduates who have been issued their undergraduate degrees early at various times throughout the year to support employment or immigration requirements outside of Canada. Please include them for information at the next Senate meeting. These degrees have been issued according to the Senate directive of March 27, 2000, which delegates to the President and the Registrar authority to grant a degree/diploma/certificate when circumstances necessitate outside the normal schedule for such approvals by Senate.

<table>
<thead>
<tr>
<th>Full Name</th>
<th>Degree</th>
<th>Confer Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmed, Neshay</td>
<td>Bachelor of Computer Science</td>
<td>01/24/2010</td>
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<tr>
<td>Choi, Jessica</td>
<td>Bachelor of Arts</td>
<td>03/19/2010</td>
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<tr>
<td>Clark, Tara Lynn</td>
<td>Bachelor of Computer Science</td>
<td>01/25/2010</td>
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<td>De Jong, Erik Geddes Pieter</td>
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<td>05/25/2010</td>
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<td>Dendukuri, Abhinav</td>
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<td>Fang, Yi-Jen</td>
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<td>Gibbs, Victoria</td>
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<td>Govindji, Raheel</td>
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<td>Ho, Willy</td>
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<td>Hoover, Andrew</td>
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<td>Karpov, Alexandre</td>
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<td>Lo, Jonathan</td>
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<td>Lopyrev, Artem</td>
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<td>Ma, Kenny</td>
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<td>Martin, Craig</td>
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<td>McLeod, Scott Andrew</td>
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<td>Meerasa, Ayesha Neelofar</td>
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<td>Pow, Nissan</td>
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<td>09/20/2010</td>
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<tr>
<td>Name</td>
<td>Degree</td>
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<td>Shields, Catherine</td>
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<td>09/30/2010</td>
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<td>Shulman, Valdimir</td>
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<td>Smith, Kevin</td>
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<td>Titins, Roland</td>
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<td>Toracchio, Corrine</td>
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<td>07/22/2010</td>
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<td>Whiteside, Jeffrey</td>
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<tr>
<td>Zhang, Linxin</td>
<td>Bachelor of Mathematics</td>
<td>09/20/2010</td>
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</table>
Academic Colleagues Meeting – October 21, 2010
These were the first Academic Colleagues (AC) Meetings of COU for the 2010 - 2011 academic year and the first part was hosted by the Ontario College of Art and Design University (OCADU).

Among the topics up for discussion before the AC were:
- Updates from colleagues with memberships on COU committees and task forces
- Update from the Executive Committee (S. Albert and J. Logan)
- Discussion topic (led by M. Rose) on Rethinking Teaching Evaluations and Teaching Assessments
- Discussion paper on Online Education: Academic Considerations (by L. Garcia and S. Albert) sparked a lively exchange of views. Once the authors have finalized this document, it will appear on the COU web site under papers by Academic Colleagues (such as the one posted in July on Student Retention; see http://www.cou.on.ca/Issues-Resources/Publications/Papers-by-Academic-Colleagues.aspx).

David C. Smith Award Reception and Dinner – October 21, 2010
The David C. Smith Award for Significant Contribution to Scholarship and Policy on Higher Education in Canada is presented annually by COU to an individual who has significantly advanced higher education and research. It is named for the late David C. Smith, who contributed to both scholarship and public policy in higher education. This year’s award winner was Don Drummond, former Senior VP and Chief Economist, TD Financial Group. He delivered a lecture related to the theme of the award.

Link: http://www.cou.on.ca/About/Chairs-and-Awards/David-C--Smith-Award.aspx

Academic Colleagues Meeting (continued) – October 22, 2010
This meeting resumed with Bonnie Patterson (President and CEO, COU) and Peter Gooch (Senior Director, Policy and Analysis, COU) providing COU and Executive updates on:
- Differentiation (more details below from Council Meeting)
- Compensation Consultations
- Lobbying Legislation
- Teaching and Learning Task Force.

Members of AC continued to discuss upcoming topics that may be candidates for further discussion papers:
- Differentiation of Academic Labour
- Research with Industry Focus
- Differentiation Among Universities
- Internationalization
- Harmonization of Credit Transfer.

Future reports can be expected to provide specific details as additional information emerges and further consensus evolves.
Differentiation Among Ontario Universities
This topic is monitored for possible implications for institutional branding and positioning within the Ontario university system. Three recent milestones are shown below. More information is anticipated as the topic receives ongoing consideration.

A. Ministry Seeds Discussion on Differentiation
In July 2010, MTCU DM Deborah Newman seeded the notion of increased institutional differentiation within the provincial system of universities.

B. HEQCO States Benefits of Greater Differentiation of Ontario’s Universities
The Higher Education Quality Council of Ontario (HEQCO) issued a report on October 26th prepared by Harvey Weingarten and Fiona Deller. It advocates that universities should “set measureable goals based on their strengths, and the provincial government should base new funding on whether those goals are met.” This would be done to foster a postsecondary system that has greater cohesion, fluidity, sustainability and quality.


C. Ontario Universities Welcome Debate on Enhancing Differentiation
COU has responded to the release of the HEQCO position paper on differentiation in the university sector by stating that the plan provides a welcome platform for further dialogue about the evolution of universities to meet the changing needs of society. “We look forward to a robust dialogue on how to best serve our students, as well as the broader communities in which we are engaged, through the different missions of Ontario’s 20 universities,” said Sheldon Levy, Chair of COU and President of Ryerson University.

Link: http://www.cou.on.ca/News/Media-Releases/COU/Ontario-universities-welcome-the-debate-on-enhanci.aspx

Meeting of Council, COU Offices – October 22, 2010
Among the topics considered during the 290th Council Meeting were:
- Provincial Online Learning Initiative (more detail below)
- Teaching and Learning Task Force (update)
- Internationalization Working Group (update)
- Credit Transfer Harmonization (update)
- Quality Assurance (update on framework and state of institutional plans)
- COU Strategic Plan (for information)
- COU Affiliates Report (for information)
- Reports were received from COU President, AUCC and Academic Colleagues
- Motion was advanced to approve OCADU as full member of COU (approved).

Online Learning
In the Queen’s Park Speech From The Throne and Budget 2010 there was reference to establishing an Ontario Online Institute “to bring the best professors from Ontario’s postsecondary institutions into the homes of those who want to pursue higher learning”.

A. In August 2010, COU prepared a supportive document entitled The Ontario Online Institute: Achieving the Transformation (COU No. 834) that makes several recommendations, such as: rather than establishing a new degree-granting entity, build upon existing courses, programs and infrastructure among willing postsecondary institutions; this collaboration among universities and colleges should have staged and coordinated implementation; government must make necessary funding available to achieve the long-term vision of the Institute.

B. The AC discussion paper Online Education: Academic Considerations was presented by S. Albert to Council; a subsequent exchange of views occurred within a broader context
Anticipated next steps include: Ontario Government to determine how and what they are prepared to invest in support of this e-learning initiative; stakeholders to determine what should be the engagement with the Ontario college sector; collaborating institutions to address the implications for credit transfer.

**Postsecondary Education (PSE) – Strategy on Mental Health**

A. Discussion of findings from a study within the elementary/secondary sector was led by B. Desbiens (Chair, Education Quality and Accountability Office). The key message was “to prepare your institutions now for the issues, including a growing number of mental health concerns, that are working through the system toward PSE.”

B. Postsecondary Mental Health and Addiction Summit (held October 2010). The key message was that the number and complexity of issues is on the rise. Seek to address: lack of services; coordination of on- and off-campus services; reducing stigma often associated with mental health issues.

**10th Anniversary of the Canada Research Chairs (CRC) Program**

To commemorate this anniversary, the Ontario Council on University Research (OCUR) will hold a celebratory event on November 24-25 at the Metro Toronto Convention Centre.

[Link](http://www.chairs-chaires.gc.ca/about_us-a_notre_sujet/statistics-satistiques-eng.aspx)

Paul D. Guild

COU Academic Colleague

October 28, 2010
FOR APPROVAL

Graduate & Research Council Appointment

Motion:
That Senate approve the appointment of Raymond Legge (chemical engineering), replacing Fue-Sang Lien, as engineering faculty representative, term to April 30, 2012.
FOR INFORMATION

Undergraduate Student Financial Aid and Scholarships [pages A27-A33]

Ken Lavigne
Registrar
### President's and Merit Scholarship Program Summary and Comparison
### Fall 2009 and Fall 2010

<table>
<thead>
<tr>
<th>Faculty or Program</th>
<th>President's Scholarship of Distinction $2,000 + renewals</th>
<th>President's Scholarship $2,000</th>
<th>Merit Scholarship $1,000</th>
<th>Total # of awards Issued</th>
<th>Total money spent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>unlimited at 95% +</td>
<td>unlimited at 90% - 94.9%</td>
<td>unlimited at 85% - 89.9%</td>
<td></td>
<td></td>
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<tr>
<td>Applied Health Sciences</td>
<td>3</td>
<td>4</td>
<td>44</td>
<td>54</td>
<td>120</td>
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<tr>
<td>Arts</td>
<td>17</td>
<td>30</td>
<td>230</td>
<td>217</td>
<td>414</td>
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<tr>
<td>Comp &amp; Financial Mgmt</td>
<td>3</td>
<td>1</td>
<td>10</td>
<td>7</td>
<td>15</td>
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<tr>
<td>Engineering</td>
<td>113</td>
<td>118</td>
<td>481</td>
<td>488</td>
<td>503</td>
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<td>Environment</td>
<td>11</td>
<td>8</td>
<td>71</td>
<td>65</td>
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<tr>
<td>Mathematics</td>
<td>155</td>
<td>186</td>
<td>388</td>
<td>447</td>
<td>366</td>
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<tr>
<td>Science</td>
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<td>49</td>
<td>174</td>
<td>183</td>
<td>239</td>
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<tr>
<td>Software Engineering</td>
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<td>12</td>
<td>48</td>
<td>55</td>
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<td>Engineering - UAE</td>
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<td>5</td>
<td>5</td>
<td>9</td>
<td>5</td>
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<tr>
<td>Mathematics - UAE</td>
<td>na</td>
<td>2</td>
<td>na</td>
<td>10</td>
<td>na</td>
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<tr>
<td>Mathematics - ELAS</td>
<td>6</td>
<td>13</td>
<td>84</td>
<td>69</td>
<td>81</td>
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<td>Totals</td>
<td>359</td>
<td>428</td>
<td>1,535</td>
<td>1,604</td>
<td>1,947</td>
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</table>

Based on view as of October 2009 and October 2010.
## 2010/11 Renison University College
### Entrance Scholarships

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Award Type/Criteria</th>
<th>Value</th>
<th># Awarded</th>
<th>Total Value Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts</td>
<td>Principal’s Scholarship for Excellence (top 2)</td>
<td>$3,000</td>
<td>2</td>
<td>$6,000</td>
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<tr>
<td>Arts</td>
<td>Principal’s Scholarship (90%+)</td>
<td>$2,000</td>
<td>3</td>
<td>$6,000</td>
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<tr>
<td>Arts</td>
<td>Entrance Scholarship (88.0% - 89.9%)</td>
<td>$1,500</td>
<td>10</td>
<td>$15,000</td>
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<tr>
<td>Arts</td>
<td>Entrance (85.0% - 87.9%)</td>
<td>$1,200</td>
<td>18</td>
<td>$21,600</td>
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<td>Arts</td>
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<td>17</td>
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<td>Arts</td>
<td>Entrance (80.0% - 81.9%)</td>
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<td>$7,500</td>
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</table>

*Total Entrance Scholarships* 65 $69,700

## 2010/11 St. Jerome’s University
### Entrance Scholarships

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Award Type/Criteria</th>
<th>Value</th>
<th># Awarded</th>
<th>Total Value Awarded</th>
</tr>
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<tbody>
<tr>
<td>Arts</td>
<td>Board of Governors Scholarship (top students)</td>
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<td>$6,000</td>
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<td>Arts</td>
<td>President’s Scholarship of Distinction (95%+)</td>
<td>$2,000</td>
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<td>$0</td>
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<td>Arts</td>
<td>President’s (90% - 94.9%)</td>
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<td>$24,000</td>
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<td>Arts</td>
<td>Entrance (88% - 89.9%)</td>
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<tr>
<td>Arts</td>
<td>Entrance (85% - 87.9%)</td>
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<td>$30,000</td>
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<td>Arts</td>
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<td>Math</td>
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<td>Arts/Math</td>
<td>Founders (top students from Catholic high schools in select regions)</td>
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<td>$5,000</td>
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*Total Entrance Scholarships* 151 $219,000
# 2010/11 Donor and Faculty Funded Entrance Scholarship Summary

<table>
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<tr>
<th>Scholarship Category</th>
<th>Value Range</th>
<th>Criteria</th>
<th># of awards</th>
<th>Amount Awarded</th>
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<td><strong>Faculty of Applied Health Sciences</strong></td>
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<tr>
<td>Waterloo International Scholarship</td>
<td>$10,000</td>
<td>top study permit students</td>
<td>0</td>
<td>$0</td>
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<tr>
<td>Named Entrance Scholarships</td>
<td>$5,000</td>
<td>top students</td>
<td>2</td>
<td>$6,000</td>
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<tr>
<td>Named Entrance Scholarships</td>
<td>$1,001 - $2,500</td>
<td>top students</td>
<td>5</td>
<td>$10,700</td>
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<tr>
<td>Named Entrance Scholarships</td>
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<td>top students</td>
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<td>$2,000</td>
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<td>AHS Faculty Entrance Scholarships</td>
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<td>$89,500</td>
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<td>$108,200</td>
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<td><strong>Faculty of Arts</strong></td>
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<td>Waterloo International Scholarship</td>
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<td>top students</td>
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<td>CFM Program Entrance Scholarship</td>
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<td>9</td>
<td>$26,000</td>
</tr>
<tr>
<td><strong>Faculty of Engineering</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waterloo/Loran Scholars</td>
<td>$32,000</td>
<td>selected by CMSF</td>
<td>1</td>
<td>$8,000</td>
</tr>
<tr>
<td>Waterloo International Scholarship</td>
<td>$10,000</td>
<td>top study permit students</td>
<td>6</td>
<td>$60,000</td>
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<tr>
<td>Named Entrance Scholarships</td>
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<td>top students</td>
<td>11</td>
<td>$44,000</td>
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<tr>
<td>Named Entrance Scholarships</td>
<td>$4,001 - $7,000</td>
<td>top students</td>
<td>24</td>
<td>$95,332</td>
</tr>
<tr>
<td>International Student Scholarships</td>
<td>$5,000/year</td>
<td>all study permit students</td>
<td>136</td>
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<td>Named Entrance Scholarships</td>
<td>$2,501 - $4,000</td>
<td>top students</td>
<td>26</td>
<td>$93,166</td>
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<tr>
<td>Engineering Faculty Entrance Scholarships</td>
<td>$3,500</td>
<td>top students</td>
<td>63</td>
<td>$220,500</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$1,001 - $2,500</td>
<td>top students</td>
<td>31</td>
<td>$64,700</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$250 - $1,000</td>
<td>top students</td>
<td>22</td>
<td>$21,250</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>320</td>
<td>$1,286,948</td>
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<tr>
<td><strong>Faculty of Environment</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waterloo International Scholarship</td>
<td>$10,000</td>
<td>top study permit students</td>
<td>1</td>
<td>$10,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$5,000</td>
<td>top students</td>
<td>2</td>
<td>$8,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$1,001 - $2,500</td>
<td>top students</td>
<td>10</td>
<td>$16,700</td>
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<tr>
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<td>$500 - $1,000</td>
<td>top students</td>
<td>44</td>
<td>$53,500</td>
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<tr>
<td>Departmental Entrance Scholarships</td>
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<td>unlimited for 80%-84.9%</td>
<td>204</td>
<td>$204,000</td>
</tr>
<tr>
<td>Departmental Entrance Scholarships</td>
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<td>unlimited for 85%-89.9%</td>
<td>147</td>
<td>$73,500</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>408</td>
<td>$549,700</td>
</tr>
</tbody>
</table>

October 2010
## 2010/11 Donor and Faculty Funded Entrance Scholarship Summary

<table>
<thead>
<tr>
<th>Scholarship Category</th>
<th>Value Range</th>
<th>Criteria</th>
<th># of awards</th>
<th>Amount Awarded (Year One only)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Faculty of Mathematics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Scholarships</td>
<td>$25,000</td>
<td>top students</td>
<td>1</td>
<td>$6,250</td>
</tr>
<tr>
<td>National Scholarships</td>
<td>$18,000</td>
<td>top students</td>
<td>5</td>
<td>$22,500</td>
</tr>
<tr>
<td>National Scholarships</td>
<td>$14,000</td>
<td>top students</td>
<td>5</td>
<td>$17,500</td>
</tr>
<tr>
<td>Waterloo International Scholarship</td>
<td>$10,000</td>
<td>top study permit students</td>
<td>16</td>
<td>$160,000</td>
</tr>
<tr>
<td>Rene Descartes Entrance Scholarships</td>
<td>$8,000</td>
<td>top students</td>
<td>4</td>
<td>$8,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$4,001 - $7,000</td>
<td>top students</td>
<td>18</td>
<td>$58,000</td>
</tr>
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<td>FARM International Student Scholarships</td>
<td>$5,000/year</td>
<td>all FARM study permit students</td>
<td>24</td>
<td>$120,000</td>
</tr>
<tr>
<td>Rene Descartes Entrance Scholarships</td>
<td>$5,000</td>
<td>top students</td>
<td>28</td>
<td>$56,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$2,501 - $4,000</td>
<td>top students</td>
<td>11</td>
<td>$37,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$1,001 - $2,500</td>
<td>top students</td>
<td>33</td>
<td>$63,828</td>
</tr>
<tr>
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<td>$500 - $1,000</td>
<td>top students</td>
<td>15</td>
<td>$15,000</td>
</tr>
<tr>
<td>International Student Scholarships</td>
<td>$2,500 - $5,000</td>
<td>top visa students</td>
<td>8</td>
<td>$37,500</td>
</tr>
<tr>
<td>Rene Descartes Entrance Scholarships</td>
<td>$2,000</td>
<td>top students</td>
<td>63</td>
<td>$126,000</td>
</tr>
<tr>
<td>Computational Math Program Scholarships</td>
<td>$1,500</td>
<td>top students</td>
<td>5</td>
<td>$7,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>236</td>
<td>$735,078</td>
</tr>
<tr>
<td><strong>Faculty of Science</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waterloo International Scholarship</td>
<td>$10,000</td>
<td>top study permit students</td>
<td>3</td>
<td>$30,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
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<td>top students</td>
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<td>$8,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$4,001 - $7,000</td>
<td>top students</td>
<td>10</td>
<td>$34,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$2,501 - $4,000</td>
<td>top students</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$1,001 - $2,500</td>
<td>top students</td>
<td>10</td>
<td>$20,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$250 - $1,000</td>
<td>top students</td>
<td>20</td>
<td>$18,750</td>
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<tr>
<td>Science Faculty Entrance Scholarships</td>
<td>$500</td>
<td>unlimited for 80%-84.9%</td>
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<td>$171,500</td>
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<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>388</td>
<td>$282,250</td>
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<tr>
<td><strong>Software Engineering</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
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<td>top student</td>
<td>1</td>
<td>$5,000</td>
</tr>
<tr>
<td>Waterloo International Scholarship</td>
<td>$10,000</td>
<td>top study permit students</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$10,000</td>
<td>top students</td>
<td>1</td>
<td>$4,000</td>
</tr>
<tr>
<td>International Student Scholarships</td>
<td>$5,000/year</td>
<td>all study permit students</td>
<td>10</td>
<td>$50,000</td>
</tr>
<tr>
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<td>$2,501 - $4,000</td>
<td>top students</td>
<td>2</td>
<td>$8,000</td>
</tr>
<tr>
<td>SE Program Entrance Scholarships</td>
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<td>top students</td>
<td>7</td>
<td>$24,500</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$1,001 - $2,500</td>
<td>top students</td>
<td>1</td>
<td>$2,000</td>
</tr>
<tr>
<td>Named Entrance Scholarships</td>
<td>$500 - $1,000</td>
<td>top students</td>
<td>2</td>
<td>$2,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>24</td>
<td>$95,500</td>
</tr>
<tr>
<td><strong>2010/11 Overall Totals</strong></td>
<td></td>
<td></td>
<td>1,662</td>
<td>$3,032,756</td>
</tr>
<tr>
<td>2009/10 Overall Totals</td>
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<td></td>
<td>1,653</td>
<td>$2,739,000</td>
</tr>
<tr>
<td>2008/09 Overall Totals</td>
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<td></td>
<td>1,728</td>
<td>$2,855,300</td>
</tr>
<tr>
<td>2007/08 Overall Totals</td>
<td></td>
<td></td>
<td>1,469</td>
<td>$2,423,282</td>
</tr>
</tbody>
</table>

October 2010
### 2009/10 Summary of Undergraduate Awards by Faculty

(including entrance and upper-year scholarships, awards and bursaries)

<table>
<thead>
<tr>
<th>Faculty</th>
<th>*UW Merit Based Awards</th>
<th>*UW Need Based Awards</th>
<th>Externally Administered Awards</th>
<th>Totals</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Domestic</td>
<td>Visa</td>
<td>Total</td>
<td>Domestic</td>
</tr>
<tr>
<td>AHS</td>
<td>Awards</td>
<td>442</td>
<td>2</td>
<td>444</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>$385,837</td>
<td>$1,150</td>
<td>$386,987</td>
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<tr>
<td>Arts</td>
<td>Awards</td>
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<td>32</td>
<td>1,492</td>
</tr>
<tr>
<td></td>
<td>Value</td>
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<td>$34,300</td>
<td>$1,738,482</td>
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<td>CFM</td>
<td>Awards</td>
<td>25</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>$37,000</td>
<td>$6,500</td>
<td>$43,500</td>
</tr>
<tr>
<td>Engineering</td>
<td>Awards</td>
<td>1,665</td>
<td>443</td>
<td>2,108</td>
</tr>
<tr>
<td></td>
<td>Value</td>
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<td>$1,290,556</td>
<td>$3,707,612</td>
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<td>Environment</td>
<td>Awards</td>
<td>537</td>
<td>17</td>
<td>554</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>$590,016</td>
<td>$17,000</td>
<td>$607,016</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Awards</td>
<td>1,391</td>
<td>591</td>
<td>1,982</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>$2,408,350</td>
<td>$1,309,600</td>
<td>$3,717,950</td>
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<td>Science</td>
<td>Awards</td>
<td>919</td>
<td>33</td>
<td>952</td>
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<tr>
<td></td>
<td>Value</td>
<td>$986,973</td>
<td>$48,500</td>
<td>$1,035,473</td>
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<tr>
<td>Software</td>
<td>Awards</td>
<td>127</td>
<td>19</td>
<td>146</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>$196,312</td>
<td>$66,000</td>
<td>$262,312</td>
</tr>
<tr>
<td>2009/10 Totals</td>
<td>Awards</td>
<td>6,566</td>
<td>1,140</td>
<td>7,706</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>$8,726,726</td>
<td>$2,773,956</td>
<td>$11,500,682</td>
</tr>
</tbody>
</table>

| 2008/09 Totals | Awards | 6,427 | 908 | 7,335 | 5,898 | 90 | 5,988 | 2,844 | 5 | 2,849 | 16,172 |
| Value | $8,923,014 | $2,100,288 | $11,023,302 | $12,278,963 | $145,600 | $12,424,563 | $6,200,944 | $13,258 | $6,214,202 | $29,662,067 |
| 2007/08 Totals | Awards | 5,755 | 696 | 6,451 | 4,856 | 50 | 4,906 | 2,721 | 6 | 2,727 | 14,084 |
| Value | $7,707,509 | $1,527,000 | $9,234,509 | $9,062,939 | $81,200 | $9,144,139 | $5,648,402 | $12,258 | $5,660,657 | $24,039,305 |
| 2008/07 Totals | Awards | 5,535 | 582 | 6,117 | 3,530 | 35 | 3,565 | 2,681 | 6 | 2,689 | 12,371 |
| Value | $7,398,620 | $1,170,730 | $8,569,350 | $6,193,672 | $80,200 | $6,273,872 | $5,618,496 | $18,478 | $5,629,384 | $20,473,196 |
| 2005/06 Totals | Awards | 3,065 | 247 | 3,312 | 5,565 | 26 | 5,591 | 2,491 | 6 | 2,497 | 11,400 |
| Value | $4,592,180 | $590,900 | $5,183,080 | $10,438,355 | $35,796 | $10,474,151 | $5,208,970 | $15,739 | $5,224,709 | $20,881,940 |
| 2004/05 Totals | Awards | 2,763 | 113 | 2,876 | 3,079 | 21 | 3,100 | 2,496 | 5 | 2,501 | 8,482 |
| Value | $3,583,779 | $316,075 | $3,899,854 | $7,462,016 | $17,124 | $7,479,140 | $5,059,046 | $8,163 | $5,067,209 | $16,446,203 |

*includes awards administered by Waterloo and affiliate university colleges
### 2009/10 Undergraduate Awards to International Students Enrolled at the University of Waterloo

<table>
<thead>
<tr>
<th>Faculty</th>
<th># of Awards</th>
<th>Value Awarded</th>
<th># of Awards</th>
<th>Value Awarded</th>
<th># of Awards</th>
<th>Value Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHS</td>
<td>1</td>
<td>$2,000</td>
<td>2</td>
<td>$1,500</td>
<td>3</td>
<td>$3,500</td>
</tr>
<tr>
<td>Arts</td>
<td>11</td>
<td>$32,000</td>
<td>42</td>
<td>$59,910</td>
<td>53</td>
<td>$91,910</td>
</tr>
<tr>
<td>Engineering</td>
<td>340</td>
<td>$1,154,100</td>
<td>136</td>
<td>$246,108</td>
<td>476</td>
<td>$1,400,208</td>
</tr>
<tr>
<td>Environment</td>
<td>3</td>
<td>$6,600</td>
<td>16</td>
<td>$15,250</td>
<td>19</td>
<td>$21,850</td>
</tr>
<tr>
<td>Mathematics</td>
<td>225</td>
<td>$772,700</td>
<td>406</td>
<td>$650,324</td>
<td>631</td>
<td>$1,423,024</td>
</tr>
<tr>
<td>Science</td>
<td>13</td>
<td>$31,000</td>
<td>25</td>
<td>$29,670</td>
<td>38</td>
<td>$60,670</td>
</tr>
<tr>
<td>Total</td>
<td>593</td>
<td>$1,998,400</td>
<td>627</td>
<td>$1,002,762</td>
<td>1220</td>
<td>$3,001,162</td>
</tr>
</tbody>
</table>

*Some recipients may be in both the designated and undesignated category; for example, an Engineering student will likely be counted under both for receiving a President's Scholarship plus the Engineering International Student Scholarship. Similarly, some students may have received multiple of one type of award.*

### 2009/10 Undergraduate Awards to Waterloo Students Participating in an International Study or Work Experience

<table>
<thead>
<tr>
<th>Faculty</th>
<th># of Awards</th>
<th>Value Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHS</td>
<td>5</td>
<td>$14,500</td>
</tr>
<tr>
<td>Arts</td>
<td>40</td>
<td>$92,050</td>
</tr>
<tr>
<td>Engineering</td>
<td>91</td>
<td>$184,900</td>
</tr>
<tr>
<td>Environment</td>
<td>23</td>
<td>$46,250</td>
</tr>
<tr>
<td>Mathematics</td>
<td>20</td>
<td>$40,500</td>
</tr>
<tr>
<td>Science</td>
<td>16</td>
<td>$32,250</td>
</tr>
<tr>
<td>Total</td>
<td>195</td>
<td>$410,450</td>
</tr>
</tbody>
</table>

**Includes awards designated for international student experiences funded by Waterloo, private donors, or the Provincial government.**
Senate Graduate & Research Council met on October 4, 2010 and agreed to forward the following items to Senate. Further details are available at: www.adm.uwaterloo.ca/injosec/Committees/senate/sgrc.htm

FOR APPROVAL

ESTABLISHMENT OF CENTRES AND INSTITUTES

Games Institute

1. Motion: To approve the establishment of the Games Institute for an initial period of five years (December 1, 2010 to November 30, 2015) as described in Attachment 2 (enclosed with the Senate Agenda). This motion is contingent upon Senate Graduate and Research Council’s approval of changes to the proposed administrative structure, which it will consider on November 15, 2010.

Rationale: The games industry is growing rapidly throughout Ontario, Canada, the U.S., Europe, and Asia, and offers numerous and wide-ranging areas for cross-faculty and multi-institutional interdisciplinary research collaborations. Furthermore, the games field is an area of strong interest for students, as researchers, creators and industry employees. The games industry is receiving substantial funding and incentives from governments, including the Ontario government. The Games Institute is proposed to advance research and knowledge in game-related interactions and technologies. The institute aims to establish strong academic and academic-industry research projects and programs, establish a richly cross-disciplinary graduate teaching and research institution, develop commercialization projects with industry partners, strengthen community ties, encourage student engagement, and enhance educational and employment opportunities for students. Research will cover video and computer games (including online games), social games, mobile games, educational and serious games, simulations and virtual worlds, more traditional non-digital games, board games and gambling games.

Funding and Space: The institute will seek funding from government (SSHRC, NSERC, MRI, etc.) and industry (Google, Microsoft, partners in the games industry and related industries); and UW seed funding through permission from the dean of arts to allocate overhead from members’ external grants to the institute. Faculty deans have not committed additional funding or space. The institute will work from existing space with the hope of eventually developing a dedicated space as the institute and its projects evolve.

Initial Core Members: Neil Randall (English); Stacey Scott (Systems Design Engineering); Karen Collins (DAC/English); Kevin Harrigan (DAC); Catherine Burns (Systems Design Engineering); Rob Burns (Kinesiology), Brian Cullen (PDF, Arts); Mike Dixon (Psychology); Jonathan Fugelsang (Psychology); Gray Graffam (Anthropology); Mark Hancock (Management Sciences); Andy Houston (Drama); Vance MacLaren (PDF, Arts); Hannah Marston (PDF, CS); Aimée Morrison (English); Marcel O’Gorman (English); Scott Spidell (Drama); Peter Taillon (PDF, Arts); Michael Terry (Computer Science). The institute’s advisory board will initially consist of Neil Randall, Stacey Scott, Karen Collins and Kevin Harrigan. One of the institute’s first tasks will be to identify and serve as a contact point for additional faculty interested in becoming members, especially from areas such as recreation and leisure, psychology, sociology and computer science.

Waterloo Institute for Social Innovation and Resilience

2. Motion: To approve the establishment of the Waterloo Institute for Social Innovation and Resilience for an initial period of five years (December 1, 2010 to November 30, 2015) as described in Attachment 1.
**Rationale:** When council’s recommendation to approve establishment of the Centre for Social Innovation and Resilience was brought to Senate on June 21, 2010, senators raised questions and concerns re: the proposed management structure and the potential for problems relating to academic freedom, academic integrity and collegial governance, and referred the proposal back to council for reconsideration ([http://www.secretariat.uwaterloo.ca/governance/Senate/20100621aminsen.pdf](http://www.secretariat.uwaterloo.ca/governance/Senate/20100621aminsen.pdf)).

Following consultation and feedback from members of FAUW, the Graduate Studies Office and the Office of Research, the proposal was revised and resubmitted. Council believes that the revised proposal effectively responds to the concerns raised by Senate. The revised proposal includes the following changes:

- Name: changed to “institute” from “centre” to more accurately describe the interdisciplinary, cross-faculty/departmental nature of the initiative.
- Institute membership: “core members” category was reviewed and deemed unnecessary.
- Director: appointment, renewal and removal procedures were clarified as per Policy 40.
- Executive Committee: membership and responsibilities were clarified.
- Board (formerly advisory committee): included to be a committee with advisory responsibilities; membership includes both UW and external members.
- Responsibilities of membership: section deleted and relevant elements incorporated elsewhere.
- Constitution: added requirement for Senate approval of ratified changes.
- Research and Education: included more detailed explanation of design phase of curriculum; clarified that ultimate responsibility for design and delivery of the graduate level curriculum rests with the University of Waterloo faculty who are associated with the SiG@Waterloo project, all of whom are members of the proposed institute.
- Operating Budget: clarified “programming” line item by describing funding for activities that support the curriculum design.

**PROGRAM CHANGES**

**Centre for Teaching Excellence (CTE) & Graduate Studies Office Certificate in University Teaching (CUT)**

3. **Motion:** To approve changes to the CUT section of the graduate studies calendar to refocus the program on doctoral students, as described below [underline = new text; strikeout = deleted text]:

   The Certificate in University Teaching provides an opportunity for graduate students to develop their teaching skills and is targeted primarily open to doctoral students who are interested in pursuing an academic career.

   The Certificate is offered jointly by the Centre for Teaching Excellence and by the Associate Provost of Graduate Studies, and is open to interested graduate students in all Faculties. Students must obtain permission to enter the Certificate and must have completed the Centre for Teaching Excellence’s *Fundamentals of University Teaching* program.

   **Rationale:** The CUT program is a comprehensive teaching development program offered jointly by the Centre for Teaching Excellence (CTE) and the Graduate Studies Office. The CUT takes, on average, six-seven terms to complete and is therefore not suitable for master’s students. With growth in graduate student admissions and increased demand for the CUT program, the CUT is being refocused on doctoral students who have clearly selected an academic career path. CTE is developing a new prerequisite teaching development program called Fundamentals of University Teaching to address the needs of other graduate students.

   The fundamentals program will be introduced in January 2011 and will consist of a series of workshops and microteaching observation sessions. Its target audience will be master’s students and doctoral...
students interested in TA training opportunities who may or may not wish to continue on to complete the more intensive CUT program. The addition of a prerequisite to the CUT will mean that doctoral students admitted into the CUT program will already have attended introductory workshops on teaching. This will enable CTE to reduce the number of required workshops for the CUT and to focus CUT workshops on key topic areas needed by university teachers. Students registered in the current CUT program will be grandfathered.

ENGLISH LANGUAGE PROFICIENCY REQUIREMENTS

4. **Motion:** To approve acceptance of the Pearson Test of English and the Renison University College English for Academic Success program for application and admission requirements to graduate studies, effective January 2011.

**Rationale:** The Pearson Test of English is a computer-based test that assesses the readiness of non-native English speakers to participate in university-level English language instruction programs. It measures reading, writing, listening and speaking ability, and is available in 165 countries and more than 5,000 testing centres. Senate approved the test for undergraduate admissions in 2010.

The English for Academic Success program is offered by Renison University College and has been accepted as an alternative to other tests for graduate studies at the University of Waterloo for many years. It is a full-time program offering 20 hours or more of intensive training per week and is designed to meet the needs of students who want to pursue studies at universities where English is the primary language of research and instruction.

5. **Motion:** To approve standard minimum English language proficiency test scores and alternative scores in the graduate studies calendar as described below [underline = new text; strikeout = deleted text]:

**English Language Proficiency Certification**

Applicants who have not completed three or more years of post-secondary work at a Canadian institution or a university at which English was the primary language of instruction, or have not completed a graduate degree at a university where English is the primary language of instruction, or have not been employed for a similar period of time in a position in which English was the primary language of business will be required to provide certification of English language proficiency through one of the accepted examinations listed below.

Individual departments/schools may require higher scores. Test scores are valid for two years from the test date. Test results must be sent directly to the Graduate Studies Office from the original source.

<table>
<thead>
<tr>
<th>Accepted Examinations</th>
<th>Required Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test of English as a Foreign Language (TOEFL) plus Test of Written English (TWE) or Internet-based TOEFL (offered through the Educational Testing Service, Princeton, NJ, USA)</td>
<td>550 minimum overall score with a minimum of 50 in each section, plus 4.0 minimum for the TWE, or Internet based minimum overall score of 90, plus 24 minimum in Speaking and Writing sections, except the following Engineering departments: Chemical Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, Mechanical and Mechatronics Engineering and Systems Design Engineering where the minimum overall score requirement is 80 with minimum section scores of 22 in Writing, 20 in Speaking, 20 in Reading and 18 in Listening.</td>
</tr>
<tr>
<td>Michigan English Language Assessment Battery (MELAB)</td>
<td>85 minimum overall score; minimum of 80 in each section</td>
</tr>
<tr>
<td>International English Language Testing System (IELTS) (Academic)</td>
<td>6.5 minimum overall score; minimum 5.5 in each section</td>
</tr>
</tbody>
</table>
Canadian Academic English Language Assessment (CAEL) | 70 minimum overall score; minimum 60 in each section
---|---
Canadian Test of English for Scholars and Trainees (CanTEST) | 4.5 minimum overall score; minimum 4.0 in each section

Graduate Studies Accepted Examinations and Required Scores:

<table>
<thead>
<tr>
<th>Paper-based TOEFL (PBT)</th>
<th>Internet-based TOEFL (IBT)</th>
<th>IELTS</th>
<th>MELAB</th>
<th>CAEL</th>
<th>New Test PTE* (Academic)</th>
<th>EFAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>580</td>
<td>90; writing 25; speaking 25</td>
<td>7.0</td>
<td>85: 80 per section</td>
<td>70: 60 per band; 70 writing; 70 speaking</td>
<td>63; writing 65; speaking 65</td>
<td>80% overall in level 400**</td>
</tr>
</tbody>
</table>

Graduate Studies Accepted Examinations and Alternative Minimum Scores:

<table>
<thead>
<tr>
<th>Paper-based TOEFL (PBT)</th>
<th>Internet-based TOEFL (IBT)</th>
<th>IELTS</th>
<th>MELAB</th>
<th>CAEL</th>
<th>New Test PTE* (Academic)</th>
<th>EFAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>550</td>
<td>80; writing 22; speaking 20</td>
<td>6.5</td>
<td>80: 78 per section</td>
<td>60: 60 per band</td>
<td>60; writing 60; speaking 60</td>
<td>75% overall in level 300 minimum of 70% in each category</td>
</tr>
</tbody>
</table>

Departments accepting the alternative minimum scores are: Chemical Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, Mechanical and Mechatronics Engineering, and Systems Design Engineering.

Rationale: There are currently several combinations of minimum English language proficiency certification requirements across graduate programs and faculties. Council supports the recommendation of the Graduate Operations Committee to adopt a standard minimum of 580 TOEFL or equivalent level, consistent with that required for undergraduate studies, and a single alternative of 550 TOEFL or equivalent level for programs wishing to use a lower requirement. Engineering is currently the only faculty with programs using the alternative lower score; however, it has put additional English language support structures in place for its students. The recommendation also includes improvements to concordance of the various test scores.

FOR INFORMATION

CURRICULAR MODIFICATIONS
On behalf of Senate, council reviewed and approved curricular modifications for the Centre for Teaching Excellence and the Faculty of Engineering (architecture, electrical and computer engineering, and management sciences).

SCHOLARSHIPS AND AWARDS
On behalf of Senate, council approved creation of the W.J. Beynon Memorial MBET Scholarship (endowed) and, subject to approval by Senate Undergraduate Council, the David Johnston International Experience Awards (endowed). Council also approved changes to the rubric for awarding Alumni Gold Medals.

/ew 
George Dixon
Vice-President, University Research

Sue Horton
Associate Provost, Graduate Studies
Proposal to establish
A University of Waterloo Institute

Waterloo Institute for
Social Innovation and Resilience

October 6, 2010
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Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

Name of Institute

Waterloo Institute for Social Innovation and Resilience (WISIR), University of Waterloo

1. Overview

1.1. Rationale and Background

Social innovation is an initiative, product, process or program that profoundly changes the basic routines, resources and authority flows or beliefs of any social system. Successful social innovations have durability and broad impact to move systems in the direction of greater resilience. Resilience is the capacity of any system to maintain its identity in the face of shocks and disturbances while continuing to adapt and learn.

At the beginning of the 21st century, our world faces multiple complex challenges, which cross boundaries of every kind: borders, cultures, disciplines and social sectors. New ways of understanding, collaborating and acting are urgently needed to ensure a socially just and resilient society. In order to move resolutely towards a positive future, we must encourage a culture of ongoing social innovation to nurture the health, resilience and vibrancy of our linked social, economic and ecological systems. More than ever before, social innovation is of extremely high interest to governments, social sector agencies, corporations, foundations, granting councils and academics.

In 2007, the Social Innovation Generation (SiG) national project, a collaborative partnership between four nodes, was initiated. Through committed institutional resources and a major grant from the J.W. McConnell Family Foundation, the University of Waterloo has played a key leadership role from the inception of this partnership by establishing one of the primary project nodes, providing academic leadership and referred to as SiG@Waterloo. SiG@Waterloo is a research and scholarship project within the University, associated with a funded Chair (the J.W. McConnell Chair in Social Innovation), as well as two additional institutionally funded faculty positions. There is also an externally funded professional staff support team.

The University of Waterloo’s reputation as Canada’s most innovative university, its recognized expertise in a range of disciplinary areas concerned with systems, complexity and innovation, and its demonstrated commitment to cross-sectoral collaborations, provide a rich and supportive environment to create the Waterloo Institute for Social Innovation and Resilience (WISIR). The creation of this Institute will intentionally integrate the nationally recognized SiG@Waterloo within this institution. A joint venture of the Faculty of Environment in partnership with the Faculty of Arts, the Waterloo Institute for Social Innovation and Resilience is thus strategically placed to continue its emerging leadership role in generating new inter-disciplinary knowledge about social innovations and the social innovation process in Canada. This will be achieved through collaborative research across UW academic units, inter-institutionally, as well as, across sectors in society. Application and mobilization of this knowledge will be achieved through relevant design and delivery of a range of new curriculum offerings and outreach activities.
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

Social Innovation Generation (SiG) exists currently as a collaborative national partnership between the Montreal-based J.W. McConnell Family Foundation, the University of Waterloo, the MaRS Discovery District in Toronto, and the PLAN Institute in Vancouver. SiG’s ultimate goal is to support whole system change through changing the broader economic, cultural and policy context in Canada to allow social innovations to flourish. The aim is to search for solutions that engage all sectors in Canada and to do so through collaborations that enrich both the whole and its parts.

The creation of the Waterloo Institute for Social Innovation and Resilience will both support this ground-breaking national collaborative and its diverse and growing list of partners, and will ensure a long-term role for the University of Waterloo as an academic leader within this growing global field. In addition, the institutional establishment of the Waterloo Institute for Social Innovation and Resilience within the Faculty of Environment in partnership with the Faculty of Arts, will recognize current and enhance future opportunities for mutually beneficial, relevant collaborations on, for example, curriculum design with the Centre for Knowledge Integration and the Masters in Public Policy, and policy research with the Biosphere Sustainability Project. The establishment of WISIR will raise the profile of these and other meaningful collaborations, both internally and externally, and will serve to generate knowledge, to influence policy, and to design 21st century curriculum, as well as to attract faculty, students and financial resources. Also important, is that this Institute will further reinforce and realize UW’s statement that “in the next decade, the university is committed to building a better future for Canada and the world by championing innovation and collaboration to create solutions relevant to the needs of today and tomorrow.” (UW website, March 2010)

1.2. Mission
Our mission is to generate new knowledge about social innovations and the social innovation process in Canada through research. In particular, we seek to understand more deeply the dynamics of learning, adaptation and innovation for the purpose of enhancing resilience. We will seek to disseminate new knowledge to academics, policy makers, practitioners, and organizations (especially those in the social sector) through a range of publications and also design and deliver learning opportunities, including graduate programs, workshops and lecture series. We are strongly committed to ongoing collaboration across disciplines, institutions and sectors, with the belief that non-traditional partnerships are necessary to achieve the mission as described above. Whenever possible, partnerships will be developed in order to leverage and share resources of intellectual, social, human and financial capital since we believe that, together, we can achieve more than the sum of what we could achieve alone.

In pursuit of our mission, WISIR concentrates on four discrete goals:

1. Create conditions for University engagement in social innovation
2. Research and document new knowledge about social innovation
3. Design new models for educating about social innovation
4. Support community capacity to design for, and act effectively in, a complex world, with the goal of increasing social resilience
1.3. Importance

Develop partnerships to bridge academic and practitioner communities – Building on its close ties with the Waterloo Institute for Complexity and Innovation and its formal relationships with various Associates, the Institute will further facilitate thoughtful and practical interactions among academics and practitioners in various arenas, including policy advocacy, funding initiatives, applied research activities, and curriculum development. The Institute will intentionally develop these relationships to exchange knowledge and experience in order to address the challenges of our complex world.

Increase trans-disciplinary, collaborative research focused on understanding and promoting innovation and resilience - The Institute will leverage current and future funding resources to continue the exploration of its emerging research agenda which is, and will, generate new knowledge on the dynamics, stages and phases of social innovation, as well as the relationship of innovation to adaptability and resilience.

Inform and educate the public - The Institute will continue to coordinate an outreach program, including annual lecture series, public workshops, on-line and real-time consultant education and collaborative community interventions, that brings new knowledge about social innovation to the broader public and to key communities of entrepreneurs, experts, policymakers, and students.

Leave a legacy of academic programming which engages future innovators and institutional entrepreneurs - The Institute will collaborate to develop and launch a unique graduate level program in Social Innovation with the express purpose to support the network of actors and social innovators in Canada through enhancing their understanding and practice of innovation in complex social-ecological systems. This curriculum is currently conceived as a Graduate Diploma, consisting of a suite of new UW courses, some of which will be approved as equivalents for potential acceptance into a relevant UW Masters Degree program. It is the Institute’s intention to collaborate with Masters program(s) within the Faculty of Environment (currently in discussion with the proposed Masters of Knowledge Integration) and Masters program(s) within the Faculty of Arts (currently in discussion with the Masters of Public Service).

Advance the University’s reputation and strategic goals – The mission and goals of the Waterloo Institute for Social Innovation and Resilience align strongly with the Faculty of Environment’s strategic focus on excellence, collaboration, experiential education, and community engagement. Its clear societal relevance will be effectively represented and leveraged through the partnership of two of UW’s Faculties, Environment and Arts. In addition, the Institute will build upon the University of Waterloo’s reputation as a leader in solution-focused and outward looking research and teaching. Through its current and planned activities, it will contribute to the University’s long-term strategic goals, as laid out in its 2005 Strategic Research Plan (SRP) and its Sixth Decade Plan. Specifically, the Institute will provide a high-profile point of connection and proven ability to mobilize knowledge for existing and emerging world-class research, teaching and faculty involved in complexity, resilience and innovation.
1.4. Staff

1.4.1. Director
The Institute will be led by a Director, proposed as Dr. Frances Westley, current McConnell Chair in Social Innovation, who will be responsible for the overall management of the Institute, preparation of its annual budget, supervision of staff members, and, with input from the Institute’s membership, guiding the research, curriculum development and outreach agendas. Dr. Westley has previously demonstrated her outstanding leadership capacity as the Director of the Nelson Institute for Environmental Studies (2005-2007) at the University of Wisconsin- Madison, and Director of the McGill-McConnell Masters program for National Voluntary Sector leaders (2002-2005) – an innovative executive masters customized for the leaders of voluntary organizations across Canada.

1.4.2. Associate Director
The Director will be assisted by an Associate Director, proposed as Cheryl Rose, current Associate Director of Partnerships and Programs for SiG@Waterloo. This role focuses upon developing and maintaining internal and external relationships, as well as overseeing the design and delivery of workshops, seminars, and public lectures.

1.4.3. Support Staff
The current complement of three to four full-time University of Waterloo professional staff positions supporting the SiG@Waterloo project will be transferred to similar positions within the Institute and will offer significant support for the launch and next stage of development. These positions are funded by the McConnell Foundation grant and will remain in place for a period of approximately two years, after which a staff review will be undergone to reexamine the needs and available resources of the Institute.

1.5. Scope of Activities
In pursuit of our mission, the Institute, currently as SiG@Waterloo, has implemented a wide variety of activities, which are either launched or in the process of full implementation over the next 2-5 years. The Institute will continue to concentrate on these specific activities in four key goal areas:

1. Create conditions for University engagement in social innovation
2. Research and document new knowledge about social innovation
3. Design new models for educating about social innovation
4. Support community capacity to design and act in complexity

CREATE CONDITIONS FOR UNIVERSITY ENGAGEMENT IN SOCIAL INNOVATION
Activities in this goal area are already well underway and include:

Faculty Team – Dr. Westley is complemented by three additional University of Waterloo faculty members associated with, and supported by, the SiG@Waterloo project. These faculty members are shared between Faculty of Environment and Faculty of Arts. In the short term, their teaching will be focused on developing and delivering the graduate diploma curriculum that is associated with the SiG@Waterloo project. On an ongoing basis it is assumed that their teaching
activities will support programs in the School of Environment, Enterprise and Development (SEED) and other programs in the Faculty. Dr. Dan McCarthy is a full-time appointment in Environment, shared by SEED and Environment Resource Studies; Dr. Carin Holroyd is cross-appointed to SEED and Political Science; the most recent faculty appointment, Dr. Mark Weber is cross-appointed to SEED and Accounting and Finance. The Chair and these three additional faculty members are all tenure-track positions and are funded by the University of Waterloo, except for Dr. Westley’s Chair position, which is currently funded by the McConnell Foundation through the 2011-2012 academic year; after that time the University has committed to continued funding for Dr. Westley’s tenured position at Waterloo.

**Graduate Student Fellowship Program** - Ongoing recruitment, training and mentorship of an inter-disciplinary team of six graduate students into the McConnell Fellowship in Social Innovation program. These fellowships are currently funded entirely by a grant from the McConnell Foundation through 2012.

**University-Community Partnerships** - Research and publish case studies to highlight new, effective ways in which academics and non-academics are working in partnership to co-create and mobilize knowledge for social impact. We will be convening individuals and teams, from within these partnerships and across various sectors for collective learning sessions and to design ways to best share their learning about process, perspective and practice.

**Waterloo Institute for Complexity and Innovation** - Collaborate with the newly created Waterloo Institute for Complexity and Innovation (WICI) at the University of Waterloo on issues of mutual benefit.

**Knowledge Commons** - Provide leadership and support for an emerging national initiative, Knowledge Commons (www.knowledgecommons.ning.com), which is a multi-sector and multi-university exploration of the role of knowledge in society.

**RESEARCH AND DOCUMENT NEW KNOWLEDGE ABOUT SOCIAL INNOVATION**

Activities in this goal area are well underway and include:

- **Case Studies** - Research and publish case studies to highlight aspects of Canadian examples of social innovation. See Appendix B for current publications.
- **Scholarly Papers** - Research and publish new knowledge on various aspects of the dynamics of social innovation.
- **Connect Research to Social Policy** - Collaborate to move research into policy through partners, such as, Canadian Institute for Well-Being, Public Policy Forum of Canada, Policy Research Initiative, Biosphere Sustainability Project, Human Resources Development Canada.
- **Resilience Network** - Provide leadership and support for the creation of the Canadian Resilience Network, with direct ties to the international Resilience Alliance.
- **International Conference** - Coordinate an annual Global Conference on Social Innovation to network international researchers and thought leaders – inaugural event held March 4 and 5, 2010.
DESIGN NEW MODELS FOR EDUCATING ABOUT SOCIAL INNOVATION
Activities in this goal area are well underway and include:

**Graduate Curriculum** - Design, develop and deliver a unique graduate diploma program in Social Innovation – the first in North America.

**Social Innovation Workshops** - Design and deliver a series of unique workshops to educate leaders in Canada's social and environmental sectors on the dynamics and phases of social innovation.

**Waterloo Lecture on Social Innovation** - Coordinate the annual Waterloo Lecture on Social Innovation, highlighting new thinking and applications for social innovation – inaugural event held January 27, 2010.

**Evaluation Education** - Coordinate a Professional Development offering to be designed and led by Michael Quinn Patton, widely recognized expert in Developmental Evaluation, to be launched in Fall 2010.

**Innovation in Action Speakers Series** - Coordinate an annual Practitioner Speakers Series to highlight leadership in moving ideas to action within specific systems in society – inaugural series launched Spring 2010.

SUPPORT COMMUNITY CAPACITY TO DESIGN AND ACT EFFECTIVELY IN A COMPLEX WORLD
Activities in this goal area are well underway and include:

**Institute of Wellbeing and Canadian Index on Well-Being** - Support the work of the CIW and actively work to integrate concepts related to social innovation within the Institute’s frameworks for future work.

**Watershed Scenarios Initiative** - Coordinate education, communication and evaluation for the collaboratively implemented Watershed Scenarios Initiative (Waterloo and Wellington Regions) – encouraging and measuring impact of scenario thinking process designed and implemented locally by world-renowned scenario process expert, Adam Kahane, since April 2009.

**National Youth Strategy** - Collaborate with the SiG national partners and key granting foundations such as Community Foundations Canada (CFC) and Ontario Trillium, to design a national long-term youth strategy to include education and leadership programs developed through WISIR as an intervention for creating conditions for social innovation in Canada.

### 1.6. Opportunities

1.6.1. Integrate with University Strengths and Resources
The University of Waterloo already provides an intellectual and research environment that is uniquely suited to supporting this Institute’s mission. This institution, as well as the Faculty of Environment which is launching this Institute in collaboration with the Faculty of Arts, demonstrate key supportive elements, which include:

- A demonstrated capacity to identify and build cross-sectoral partnerships for applied purposes.
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

- Existing and emerging world-class research, teaching and faculty, especially in the Faculty of Environment, involved in complexity, resilience and innovation that offers the Institute opportunities for mutually beneficial collaborations.
- A national reputation for blending first class theoretical study with real world, practical experiences as education and training for students.

1.6.2. Supporting On-Campus Collaboration
The Institute will interact closely with Departments, Centres and Institutes across the University community already pursuing research and teaching related to complexity, resilience and social innovation, including:

- Centre for Knowledge Integration (Faculty of Environment)
- Centre for Ecosystem Resilience and Adaptation (Faculty of Environment)
- The Healthy Communities Research Network (Applied Health Sciences)
- Waterloo Institute for Complexity and Innovation (VP Research)
- Centre for Business, Entrepreneurship and Technology (Faculty of Engineering)

It is noted that with proximity to UW’s world class activities related to Technology, the Institute will seek to explore opportunities that likely exist to form partnerships with Technology researchers and innovators.

1.6.3. Develop Local, National and International Connections
The Institute will continue a strategic practice of fostering strong partnerships and continue to build new relationships nationally and internationally. In addition to relevant collaborations with a number of Canadian universities (especially York University on curriculum design), the following are some key connections:

In Canada:
- Canadian Institute of Wellbeing and Canadian Research Advisory Group
- Human Resources Development Canada
- J.W. McConnell Family Foundation
- Community Foundations Canada
- MaRS Discovery District
- Plan Institute on Caring Citizenship
- Public Policy Forum of Canada
- Policy Research Initiative

In the United States:
- Stanford Social Innovation Review (Stanford University)
- Harvard Social Enterprise Initiative (Harvard University)

International:
- Stockholm Resilience Centre (Sweden)
- Young Foundation (UK)
- Resilience Alliance (ITNL)
- Oxford School of Business – Skoll Centre for Social Entrepreneurship (UK)

1.7. Advancing UW’s Strategic Plans
The Institute will ensure a long-term role for the University of Waterloo as an academic leader within this growing global field. The University’s Strategic Research Plan (SRP)
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

lays out broad objectives that include facilitating synergies between basic research and its applications, stimulating “high impact interdisciplinary research on societal problems,” and increasing knowledge exchange – all core components of this proposed Institute’s activities. The Institute will also help the University achieve the goals in its Sixth Decade Plan, which promotes interdisciplinary research and teaching.

2. Constitution

2.1. Objectives
As outlined in Section 2.5, the Institute has four discrete goal areas (see below), with relevant objectives and key activities underway within each:

1. Create conditions for University engagement in social innovation
2. Research and document new knowledge about social innovation
3. Design new models for educating about social innovation
4. Support community capacity to design and act in complexity

2.2. Administrative Structure and Officers

2.2.1. Director
The Institute will be led by a Director, reporting to the Vice-President, University Research. The Director will be appointed by the Vice-President, Academic & Provost on the recommendation of the Vice-President, University Research for a first term of up to four years. The Director will be responsible for the overall management of the Institute, the preparation of its annual budget, supervision of Institute employees, and for guiding the research agenda of the Institute, with input from its membership. The Vice-President, University Research, or designate, will annually review the performance of the Director. It is proposed that the Institute’s first Director be Dr. Frances Westley, current UW Chair in Social Innovation. It is proposed that Dr. Westley’s term be for a period of four years and be renewable once upon the recommendation of an Advisory Committee appointed by the Vice-President, University Research.

2.2.2. Associate Director
The Director will recruit, hire and be assisted by an Associate Director, Partnerships and Programs. The Associate Director will be responsible for the day-to-day direction and support of the Institute’s Partnerships and Programs. This includes developing and maintaining internal and external relationships, as well as overseeing the coordination of workshops, seminars, and public talks. It is proposed that the Institute’s Associate Director be Cheryl Rose, currently the Associate Director of SiG@Waterloo, for a period of two years, after which a review of this position is recommended.

2.2.3. Executive Committee
The Executive Committee will guide the management of the Institute through making recommendations on regular operations and development to the Director and Vice-President, University Research. Among its tasks, the Executive committee will review new membership nominations and the annual budget, discuss new initiatives (e.g. grant proposals and partnerships) and infrastructure needs, and identify new areas for future
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

growth, all of which will be provided as recommendations to the Director and Vice-President, University Research.

The Executive Committee will be chaired by the VP, University Research, or designate, and will include the Institute Director. The committee will meet two or three times per year. Inaugural committee membership will be current Institute members from departments and/or units closely associated with the SiG@Waterloo project, and consist of:

- Vice-President, University Research (Chair)
- Director of the Institute
- One representative faculty member from Department of Environment and Resource Studies
- One representative faculty member from Centre for Knowledge Integration
- One representative faculty member from School of Environment, Enterprise and Development
- One representative faculty member from Department of Political Science
- One representative faculty member from School of Accounting and Finance
- One representative faculty member from the Waterloo Institute for Complexity and Innovation
- One PhD graduate student representative from the McConnell Social Innovation Fellowship Program

The Members of the Executive Committee will be nominated by the Institute membership and approved by a simple majority of members of the Institute who are not seeking seats on the Executive Committee. For this purpose, a quorum will consist of 50 percent of Institute membership. Executive Committee members will serve for a term of three years, normally renewable once. A slate of members for the inaugural Executive Committee will be proposed; within 2 – 3 months of approval of this Institute, a full membership meeting will be called to present this slate of nominations, to seek other nominations from the membership, and to vote on the first members of the Executive Committee.

2.2.4. The Board

The Board will provide advice to the members of the Executive Committee on the Institute’s governance and scientific direction. Advisors will also help the Institute establish connections and maintain its profile within the national and international social innovation research and practitioner communities. It will consist of senior administrators, outstanding researchers and practitioners from the University, Canada, and abroad who are Institute members.

Board members will be nominated by the Executive Committee members and approved by a majority vote of the Executive Committee. Membership lasts for three years and is renewable. The Board Chair will be selected in a manner acceptable to the Executive Committee and will serve for a period of up to three years, normally renewable once.

Board Membership:
- Vice-President, University Research
- Director of the Institute
- Dean of Environment or faculty member designate
- Dean of Arts or faculty member designate
Two faculty members at large
One external university academic representative (from Academic members)
Two external professional practitioner representatives (from Practitioner members)

2.3. Categories of Membership
The Institute will convene its Academic Members, Practitioner Members, and Student Members, for a variety of purposes, and in its interactions with members will uphold the principles of academic freedom aspired to by the University of Waterloo academic community. Membership participation may include the following:

1. Direct contact related to specific research opportunities and other activities, including curriculum development. The Director or any member will initiate discussions based on perceived opportunities, e.g., a call for proposals, knowledge of a possible project, etc.
2. Small group meetings. Members of the Institute will be encouraged and facilitated in arranging meetings that advance Institute goals.
3. Think-Tank sessions. The Institute will convene Think-Tank sessions on various topics that are of interest to stakeholders, organizations or the Institute’s members.
4. Regular invited lectures and seminars. The Institute will convene several regular series of seminars.
5. An Annual Event. This will be a learning and networking event to review the activities and accomplishments of the Institute as well as to promote dialogue on social innovation topics. It will bring together the variety of Institute members, as well as external parties. The objective will be to share knowledge, further collaboration, and define new projects. This will also be means of generating new interest and membership.

2.3.1. Academic members
Academic members are regular, research, or adjunct University faculty from a recognized University or research institution, or non-University researchers, including postdoctoral fellows, who actively participate in setting the research/teaching agenda or are involved in one or more research projects affiliated with the Institute.

Academic membership will be decided by simple majority vote of the Executive Committee based on a candidate’s nomination or application and the submission of a C.V. Membership lasts for three years and is renewable.

For a list of initial Academic members, please see Section 4.1.

2.3.2. Practitioner members
Practitioner members are professionals who actively participate in Institute activities. This includes individuals in government, the voluntary section, and private sector interested in the Institute’s research and findings, and who actively participate in Institute activities, such as meetings, workshops, conferences and outreach programs.
Practitioner membership will be decided by simple majority vote of the Executive Committee based on a candidate’s nomination or application and the submission of a résumé. Membership lasts for three years and is renewable. For a list of initial Practitioner members, please see Section 4.2.

2.4. Student Members
Student Members are graduate students who currently hold Fellowships in Social Innovation at the University of Waterloo. Student membership will be decided by simple majority vote of the Executive Committee based on a candidate’s nomination or application and the submission of a résumé. Membership lasts for one year and is renewable.

2.5. Changes to the Constitution
Any member of the Institute may submit recommendations for changes to the definitions, terms and descriptions of the Institute’s constitution. Recommendations for changes must be ratified by 75 percent of the Membership of the Institute and a simple majority of the members of the Executive Committee. For this purpose, a quorum will consist of 50 percent of the Executive committee’s members (either present or by proxy). Ratified recommendations for changes will then be submitted for approval by Senate.

3. Management

3.1. Financial Responsibility
The Director will have primary responsibility for the budgeting and resource development of the Institute, with day-to-day budget management overseen by the Associate Director. The Dean of the Faculty of Environment will be the primary officer vested with financial oversight.

3.2. Reporting Mechanism
In a true spirit of collaboration and integration, the Institute will report on an annual basis to the Deans of the Faculty of Environment and the Faculty of Arts. This report will address the evaluation criteria listed in Section 8.1 and include detailed statements of:

- Research Projects (including: project title, involved faculty members and departments/schools, project total funding and annual expenditures, and a statement of progress and further work).
- Other Scholarly Activities (including publications, presentations, seminars, think-tanks, and other activities).
- Outreach Activities (including public lectures, consultations, community collaborations, etc.)
- Administrative Activities (including: promotional activities, major meeting and presentations, industry participation and support, infrastructural budget and spending).
- General Progress Towards Goals and Objectives (including strategic progress related to sustainability of the Institute) on key activities. Specific financial reports
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

will go directly to the Dean of Environment, who oversees the financial management of this Institute.

4. Membership

4.1. Academic members
The following initial Academic members are regular, research, or adjunct University of Waterloo faculty, faculty from other academic institutions or non-university researchers, including postdoctoral fellows, who actively participate in one or more projects affiliated with the Institute:

Howard Armitage – E.D. of Centre for Business, Entrepreneurship and Technology, UW
Frederick Bird – Political Science, UW
Amelia Clarke – Centre for Environment and Business, UW
Ken Coates – Dean of Faculty of Arts, UW
Diana Denton – Communication, Leadership and Social Innovation, UW
George Francis – Environment, Professor Emeritus, UW
Bob Gibson – Faculty of Environment, UW
Keith Hipel - Systems Design Engineering, UW
Carin Holroyd – Political Science and SEED, UW
Thomas Homer-Dixon – Chair, Global Systems, Balsillie School of Int’l Affairs, UW
Edward Jackson – Carleton University, Dean of Faculty of Public Affairs
Ed Jernigan – Centre for Knowledge Integration, UW
Sally Lerner – Faculty of Environment, UW
Dan McCarthy – SEED and Environment Resource Studies, UW
Walter Mittelstaedt – Director of Centre for Mental Health Research, UW
Michael Q. Patton – Utilization-Focused Evaluation
Blake Poland – University of Toronto
Stephen Quilley – Keele University (UK), Institute for Law, Politics & Justice
Emmanuel Raufflet – HEC Montreal, Associate Professor
Bryan Smale – Applied Health Sciences, Associate Dean, UW
Janice Stein – University of Toronto, Munk Centre, Director
Paul Thagard – Psychology and Computer Science, UW
Mark Weber – SEED and Accounting and Finance, UW
Olaf Weber – SEED, Faculty of Environment, UW
Frances Westley – Faculty of Environment/Faculty of Arts, UW
Steve Young - School of Environment, Enterprise & Development, UW
Brenda Zimmerman – York University, Schulich School of Business

4.2. Practitioner members
The following initial Practitioner members are professional individuals who actively participate in Institute activities:

Joanne Achoka – Centre for Community Based Research
Jeff Barnum - Reos Partners, co-founder
Rick Blickstead – Wellesley Institute
Paul Born – Tamarack Institute, Executive Director
Tim Brodhead – J.W. McConnell Family Foundation, President
Mark Cabaj – Vibrant Communities, Executive Director
John Colangeli – Lutherwood, Chief Executive Officer
Celia Cruz – Ashoka Canada, Director
Tim Draimin – Social Innovation Generation, Executive Director
Ali Etmanski – PLAN Institute on Caring Citizenship, President
Allyson Hewitt – MaRS Discovery District, Director of Social Entrepreneurship
Stephen Huddart – J.W. McConnell Foundation, Vice-President
Jane Humphries - Community Foundations of Canada, Vice-President
Andrew Hunter – DodoLab, Principal
Adam Kahane – Reos Partners, Partner
Marc Langlois – Heartwood Youth Leadership
Peter Levesque – Knowledge Matters
Bruce MacDonald – Big Brothers Big Sisters of Canada
Joe Mancini – The Working Centre
Michael Manolson – Genesis Consulting
Hulene Montgomery – Lyle S. Hallman Foundation, Executive Director
Elisha Muskat – Ashoka Canada
Lynn Randall – Region of Waterloo
Ingrid Richter – Threshold Associates
Joy Roberts – Musagettes Foundation
Tracey Robertson – Trillium Foundation, Waterloo-Wellington Region
Judith Rosenberg – Spark of Brilliance, Director
Alicia Samuel – Microsoft Corporation
Susan Scotti – Human Resources & Social Development
Roy Sharples - Microsoft Corporation, Innovation & Industry Strategist
Lynne Toupin – Human Resources Council, Executive Director
Ilse Treurnicht – MaRS Discovery District, Chief Executive Officer
Eric Young – Eric Young Enterprises, The Social Projects Studio

5. Research and Education

5.1. Specific Research Topics
The research mission of the new center will be to build theory, methods and case based data that will contribute to a richer understanding of social innovation in complex social systems. We are interested in all phases of social innovation from initial invention to widespread adoption of new approaches, practices, designs policies and programs in Canada. In particular research will focus on those social innovations which contribute to building linked social-ecological resilience and re-engaging vulnerable populations.

5.1.1. Current projects

• Building Resilience through Social innovation in Linked-Social Ecological systems.
• Understanding new forms of finance and their relationship to social innovation.
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- Mental Health: Resilience models of mental health and implications for application.

Building an elaborated framework for understanding the dynamics of scaling up social innovations in order to affect the broad social institutions that created the problem in the first place:

1. Pathways for social innovation: how starting conditions affect the course of development of social innovations from initiation to broad impact
2. The role of social, institutional and policy entrepreneurs in the process of successfully scaling social innovation in social ecological systems
3. Particular competencies associated with social, institutional and policy entrepreneurs
4. The role of government and governance in creating the conditions for social innovation.
5. Cross cultural models of government responses to social innovation (Canada, Australia on resilience approaches to mental health and social innovations that contribute to such resilience
6. Phase appropriate government and governance processes, tools, programs and incentives

5.1.2. Planned research

Design Thinking and Social Innovation: In collaboration with Ed Jernigan in the Center for Knowledge Integration, we plan to apply for funding for the study of the role of design thinking in successful innovation.

Social Innovation Through History: In collaboration with researchers from Arts, Environment and other universities we are planning to apply to SSHRC in Fall 2010 for funds to cover longitudinal case studies of successful and unsuccessful social innovation in Canada.


Methodologies for Trans-Disciplinary Research – with Stockholm Resilience Center and Stanford University.

For a complete list of available and forthcoming publications, see Appendix B.

5.2. Student activities

Graduate student fellowship program - The McConnell Fellowships in Social Innovation are awarded annually to six graduate students who will join an interdisciplinary team to research and support social innovation in Canada, particularly within arenas of social-ecological problems and challenges associated with re-engaging vulnerable populations. Students can come from any discipline and should be in the last year of a Masters program or any year of a PhD program. At this time, our fellowship program includes three outstanding PhD candidates who have been working with us for more than two years, as well as two Masters candidates who are in the second year of program participation. Our newest fellow is a PhD candidate who joined our team in January 2010.
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As the student fellows graduate or as our research support requirements change, we open our recruitment process so that a team of six is actively maintained.

5.3. Curriculum
We are progressing rapidly through the design stage of an exciting new initiative, developing a graduate level program in Social Innovation whose express purpose is to support the network of actors and social innovators in Canada with professional education. This design phase has already collaboratively involved a variety of University of Waterloo faculty members as well as leading researchers at other academic institutions, corporations, government ministries and community organizations. Ultimate responsibility for design and delivery of the graduate level curriculum rests with the University of Waterloo faculty who are associated with the SiG project, all of whom are members of this proposed Institute.

Graduate Diploma: In recent conversations with colleagues in the Faculty of Environment and in the Office of Graduate Studies, it has been determined that a most appropriate vehicle for the central curriculum of this program will be a new UW Graduate Diploma. It is expected that this Diploma will be launched in September 2011 once it has successfully proceeded through the normal approval processes in SEED, the Faculty of Environment, Senate Committees and OCGS.

The graduate diploma is conceived as an applied program, targeted at executive level professionals from three different sectors that offers a part-time, flexible schedule to accommodate learning while working. The diploma is focused on understanding the complex systems in which social problems are embedded and offers a range of learning experiences to immerse students in both conceptual models and real world issues through presentations, discussions, field trips to examine real contexts, and group work.

Small cohorts will form three groups, with multi-sector representation, but with shared interest in a particular social issue. Each of these issues-based groups will be assigned an experienced coach. These program staff will pay particular attention to engaging the students as a diverse community with common aspirations, supporting the process of revealing individual/sector assumptions as well as deepening individual/team awareness of their own and others' perceptions of context, challenges and opportunities. A key objective will be to affirm and enhance an understanding of the value of cross-sectoral initiatives and to begin developing capacities for ongoing, open communication among participants and program faculty and staff in order to support successful development of a learning community. The coaches will also act as teaching assistants and will offer these executive learners intentional support related to the learning skills necessary to successfully complete program assignments, research projects and final reports.

• The diploma will be project-focused with participants deliberately recruited because of their interest/involvement in 3 different “problem domains” that will vary from one cohort to the next, and be selected by the design team based upon tri-sector interest and relevance, as well as opportunity to support policy development.
Within each problem domain we will seek to balance representatives from private, public and social sectors. So, for example, if food security is the issue we will attempt to engage those working in the food production and distribution systems, government representatives responsible for food inspection, agriculture etc., and NGOs working in food banks, distribution systems, etc.

The development of the team research projects will be integrated throughout the diploma’s courses and focus on:

- Understanding the complex dynamics shaping the focal problem domain through research and reading;
- Identifying opportunities for innovation and existing innovation with broad impact potential;
- Identifying the financial, political and social barriers, and opportunities for scaling the innovation and creating practical recommendations for action.

5.4. Conferences and Seminars

The Institute will convene events that bring together researchers and students from across disciplines to advance research and learning focused on promoting innovation and resilience in social and ecological systems.

**Academic Conference on Social Innovation** - March 4 and 5, 2010, approximately twenty leading academic researchers and thought leaders from around the globe were hosted by SiG@Waterloo at an academic conference meant to stimulate collaborative, integrative thinking on the topic of social innovation. Plans are established to convene this group annually, around specific themes (for example, Design and Social Innovation in 2011) to intentionally build this academic learning community.

**Evaluator’s College** – Proposal in development to initiate an annual national developmental evaluation training college led by Michael Quinn Patton. This would involve 2 face-to-face training sessions that would be supported by the Institute, in conjunction with an 8-12 month period when the student practitioners would conduct a developmental evaluation project for an organization or institution while being coached by Patton.

6. Partnerships and Outreach

6.1. Local Collaborations

Scenario Planning – A group of socially engaged individuals from Waterloo and Wellington Counties have convened an on-going and co-creative process called the “Watershed Initiatives” to think creatively about what our communities might look like by the year 2020, and to act innovatively on what emerges from the process. Our staff is guiding this process, coordinating communication and evaluating impact.

Waterloo Unlimited – UW’s Waterloo Unlimited program is partnering with our staff to design a unique program to launch at the local high school level, focused on enrichment and engagement of at risk students.
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Waterloo Region Youth Project – Waterloo Region is partnering with our staff to explore the realities of youth in this Region, to identify specific risk scenarios and to intervene in innovative ways to increase the resilience of the Region’s youth population.

Community University Expo 2011 – The Associate Director is co-chairing the program committee for this Canadian-led, international conference coming to Waterloo in May 2011. The current staff team is also collaborating to coordinate a six-part public round table series on “knowledge in society”, leading up to the conference opening.

6.2. National Collaborations

Canadian Resilience Network - Dan McCarthy, SIG@Waterloo faculty member, is spearheading the organization of a Canadian Resilience Network, based in the new Institute. A website has been organized and the first meeting of Resilience scholars from across Canada will be convened in several months.

National Youth Strategy - SiG@Waterloo is partnering with Community Foundations Canada, as well as consulting with Marc Langlois, to co-design a comprehensive youth education and engagement program, with hopes of piloting elements over the course of 2010. Initial activity may include a youth summer institute to build the capacity in youth for understanding social innovation and acting as institutional entrepreneurs.

Institute of Wellbeing and Canadian Index on Well-Being (CIW) - Frances Westley is engaged in supporting the work of the CIW and actively working to integrate concepts related to social innovation within the Institute’s frameworks for future work. Its mission is to report on the quality of life of Canadians, and promote a dialogue on how to improve it through evidence-based policies that are responsive to the needs and values of Canadians.

Social Innovation Generation network – SiG is a collaborative partnership between the Montreal-based J.W. McConnell Family Foundation, the University of Waterloo, the MaRS Discovery District in Toronto, and the PLAN Institute in Vancouver. Our ultimate goal is to support whole system change through changing the broader economic, cultural and policy context in Canada to allow social innovations to flourish.

SSHRC-CURA - “Partnerships in Dementic Care” (Principle Investigator, Sherry Dupuis – Applied Health – University of Waterloo). SiG to offer support for study of innovations in approaches to care and treatment of patients with dementia.

6.3. International Collaborations

Resilience Alliance – Frances Westley and SiG are engaged in collaboration with a global network of scientists and social scientists including Stockholm Resilience Center, University of Wisconsin, Madison; Arizona State University, University of Cape Town, McGill University, CSIRO-Australia and others in a long term broad based exploration of the factors which build social-ecological resilience and maintain planetary boundaries within safe limits. This involves the development of short courses, working on the editorial board of Ecology and Society, the RA journal and working on papers with other scholars.
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in particular with regards to early warning systems of critical transitions in linked social ecological systems.

Stockholm Resilience Center – As vice-chair of the board of Stockholm Resilience Center, Frances Westley works in collaboration with scholars at SRC on a variety of projects linking social innovation to transformation and adaptation in linked social ecological systems. In the past we have developed joint curriculum, shared jointly funded doctoral students. In the near future the two organizations plan to collaborate on a workshop, synthesis paper and book on social innovation and transformations in linked social-ecological systems and potentially the development of linked doctoral courses.

South American Resilience and Sustainability (SARAS) - As part of the academic advisory board of this new organization devoted to the role of science and art in building resilience in South America, CSIR will partner on workshops and potential course development.

6.4. Outreach Program
The Institute will link its membership to the wider community in a number of ways:

6.4.1. Community initiatives
The Institute will support activities that enhance the development of meaningful partnerships and advance collaborations for innovation between academic and public, private and community sectors.

National Youth Strategy - In collaboration with our SiG national partners and Community Foundations Canada, we are currently exploring the development of an education element for a national youth strategy. Plans are underway to launch an Institute focused upon building the capacities of young people who are already involved in innovative community initiatives and/or identified by leaders in Canada's social sector as inclined towards thinking and acting as social innovators. Through these activities, this partnership will significantly enhance Canadian community and organizational capacity to support and follow the leadership of the next generation of socially aware and innovative individuals. Such a strategic investment in Canada's youth, as our emerging social sector leaders, will focus new talents and energies on social innovation. It is hoped that the Institute as part of a nation-wide strategy will launch by 2012. An additional element of a national strategy might also include: The 'café’ – SIG@Waterloo is collaborating with Marc Langlois to pilot an innovative idea for a "café" which operates as a social enterprise in Waterloo Region but also combines youth engagement and community development, having at its core a young leader able to catalyze social change. There is potential to scale up to a national program.

Workshop series – We are leading the ongoing development of series of intensely designed workshops to educate and accelerate progress through the stages and phases of socially innovative initiatives. These educational offerings are designed collaboratively, led by Dr. Westley, and will be a central focus of the offerings of a consultancy corps being developed by the McConnell Foundation to support social innovators across the country. One of three proposed workshops is currently designed, tested, and ready for dissemination in Fall 2010.
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Knowledge Commons - In collaboration with national networks associated with university-community partnerships, we are facilitating dialogue (real-time and on-line) and advocacy for systemic changes to enhance capacities for the identification, development and leveraging of meaningful partnerships between academic and non-academics for social impact on a variety of pressing issues. In addition, we are conducting research across a number of exemplary cross-sector partnerships to identify specific conditions for innovation to emerge with high impact results. These results will be disseminated through a variety of means, including a case study format, as well as the production of a documentary video.

6.4.2. Communication
The Institute will continue, and expand where possible, a strategic communication plan focused intentionally upon broad, accessible dissemination of information on Institute activities and new knowledge related to the concepts and practice of social innovation. The current communication strategies include:

- Comprehensive website (sig.uwaterloo.ca), re-designed in January 2010, which highlights events, publications and the development of other initiatives. Upon approval, this website will change its address to become a website for the Waterloo Institute for Social Innovation and Resilience, with the SiG@Waterloo project as the chief current component.
- Monthly e-newsletter with a subscription of over 1,000 individuals from across the country.
- As one of the four SiG national partners, a high profile link off the SiG national 'clearinghouse' website (sigeneration.ca).
- Sharing of a white paper series in hard copy and on-line formats – submitting papers for scholarly publication in relevant journals as they are complete.
- Sharing of a series of case studies for teaching purposes; available on-line in pdf format and also as hard copies – submitting relevant cases for publication in journals and/or books.
- Publications, including case studies, white papers and peer reviewed articles. For complete list of available and forthcoming publications, see Appendix B.

Future plans for enhancing Institute communications involve increasing the engagement of academic and non-academic thought leaders to support our efforts to communicate and to raise the profile of social innovation generally and, more specifically, the work of the Institute and its partners. Additionally, in anticipation of advancement of internet technologies, we plan to once again update and redesign our website as required within the next five years. Lastly, in collaboration with students and faculty members, we will discuss the logistics and potential impact of launching an on-line journal in the near future.

7. Outcomes

7.1. Measuring Success
Specific outcomes to track as metrics of success have already been established for activities associated with the SiG project (3 years into a 5 year grant). These and additional success markers will continue to be evaluated, measured and learned from
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

while we move forward as the Waterloo Institute for Social Innovation and Resilience. Over the next two years, and looking forward through another three years beyond 2012, we are able to forecast the achievement of the following general outputs and performance indicators. These will be tracked and measures documented by Institute staff to be shared through annual reports.
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<table>
<thead>
<tr>
<th>Expected Results / Goals</th>
<th>Outputs / Accomplishments</th>
<th>Performance Indicators</th>
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<tbody>
<tr>
<td>CREATE CONDITIONS FOR UNIVERSITY(IES) TO ENGAGE IN CREATING CONDITIONS FOR SOCIAL INNOVATION</td>
<td>• Co-found and support WICI development &lt;br&gt;• Facilitate the advancement of the Knowledge Commons Initiative &lt;br&gt;• Recruit a Social Innovation Faculty Team &lt;br&gt;• Lead to establish the Canadian Resilience Alliance</td>
<td>• WICI approved in April 2010 – support WICI goals through 2015 to increase transdisciplinary, collaborative research focused on promoting innovation and resilience. &lt;br&gt;• Knowledge Commons membership, event and on-line space participation, strategy documents developed, advocacy action plans initiated, changes noted in academic-non/academic partnerships resulting in positive social impact &lt;br&gt;• Social Innovation Faculty Team complement complete, designing and teaching curriculum, successfully gaining relevant research grants, conducting and publishing research with social innovation focus &lt;br&gt;• Resilience scholars have opportunities to more intentionally connect and collaborate on social-ecological challenges</td>
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<tr>
<td>RESEARCH AND DOCUMENT INDIVIDUAL ILLUSTRATIVE CASES; GENERATE AND SHARE NEW KNOWLEDGE ON SOCIAL INNOVATION</td>
<td>• Research, document and publish a minimum of 4 annual illustrative cases; generate and share new knowledge on social innovation through a minimum of 4 annual scholarly publications</td>
<td>• A body of publications and case studies useful to researchers and practitioners is published and made use of through citations of research in scholarly journals, mention of activities in popular media, use of the Institute's tools, methodologies, and research findings by practitioners, clinicians, policy makers, and managers engaged in social innovation</td>
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<tr>
<td>DESIGN NEW MODELS FOR EDUCATING ABOUT SOCIAL INNOVATION</td>
<td>• New curriculum development at Waterloo &lt;br&gt;• Design and implementation of Graduate Diploma in Social Innovation &lt;br&gt;• Design Workshop Series &lt;br&gt;• Train professional consultants &lt;br&gt;• Public presentations across Canada and</td>
<td>• Up to 5 new courses designed and approved at UW by 2011, and for use in a new Graduate Diploma Program as well as potentially enhancing elective options in one or more Masters Degree programs; a legacy of academic programming which engages future innovators and institutional entrepreneurs &lt;br&gt;• 2-3 uniquely designed workshops designed and used for consultant training &lt;br&gt;• A national team of consultants (@20) trained to support innovation in social sector programs; building a community of</td>
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<tr>
<th><strong>OUTREACH TO INVESTIGATE AND SUPPORT NEW STRATEGIES FOR DEVELOPING COMMUNITY CAPACITIES FOR SYSTEMS THINKING, DESIGN FOCUS, WORKING WITH COMPLEXITY, ENHANCING RESILIENCE</strong></th>
<th><strong>ESTABLISH INSTITUTE AS A UNIQUE ‘SPACE’ FOR INTERFACES BETWEEN ACADEMIC AND OTHER VARIOUS SECTORS; INSTITUTE DEMONSTRATES RICH, SKILLED CAPACITY TO CONVENE, FACILITATE DIALOGUE, GENERATE</strong></th>
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<tr>
<td>internationally</td>
<td>practice testing and applying these theories</td>
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<tr>
<td>• Watershed Initiative achieves broad engagement and impact is communicated effectively through a variety of technologies</td>
<td>• Institute staff further develop expertise and wide recognition through numerous annual presentations to both academic and non-academic audiences</td>
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<tr>
<td>• National Youth Strategy for supporting, educating and networking young social innovators is launched in Canada</td>
<td>• Waterloo Region ‘system’ becomes actively engaged in key areas identified for attention, and impact results</td>
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<tr>
<td>• Support the work of the Canadian Index for Well-Being and actively work to integrate concepts related to social innovation within the Institute’s frameworks for future work</td>
<td>• Impact of ‘scenario thinking’ documented and shared nationally</td>
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<td></td>
<td>• Youth leadership for positive social change finds new national support and Institute leads on annual education program (Summer Institute is established by 2012)</td>
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<td></td>
<td>• Increased, integrated participation and leadership by Canadian youth in social innovation initiatives</td>
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<td></td>
<td>• Measurement of Well-Being in Canada includes evaluation of conditions for social innovation to emerge and be successful</td>
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<td>• Attract, train, fund a highly effective, learning-oriented team skilled at developing relevant partnerships and ability to operationalize sophisticated plans for online and in person events/activities with goals of generating and testing new ideas, networks and action</td>
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<td>• Annual conferences and seminars are well attended</td>
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<td></td>
<td>• Participation in Institute’s events and activities is viewed as exceptionally accessible, is diverse and includes both academics and non-academics</td>
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<td></td>
<td>• Institute’s programming is evaluated highly in terms of learning and networking opportunities for research and practice</td>
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<td></td>
<td>• Appearance of innovative approaches to social innovation that have been directly stimulated by Institute activities</td>
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<td></td>
<td>• Communicate through various mediums in support of learning events/activities</td>
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## Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

<table>
<thead>
<tr>
<th>KNOWLEDGE, COMMUNICATE AND BUILD VIBRANT NETWORKS ABOUT SOCIAL INNOVATION</th>
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<tr>
<td><strong>SUSTAINABILITY FOR THE INSTITUTE</strong></td>
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<tr>
<td>• Relationships that include potential for funding opportunities are actively developed by Institute leaders as well as in collaboration with UW Development Office and the SiG national partners</td>
<td>• Funding for research, staff, facilities, communications, and programming is secured through partnerships with the public sector, private corporations and foundation support</td>
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8. Facilities

8.1. Existing Space / Facilities
The SiG@Waterloo unit is currently located in leased space at the former Public Utilities Building in downtown Kitchener, 195 King Street West – suite 202. In addition, Dr. Westley currently has an office on campus in the Modern Languages building.

8.2. Required Space / Facilities
The Institute will operate as both a virtual and place-based organization taking advantage of existing facilities. The Institute does not have a goal of centralizing its membership, but rather gains strategically from the fact that its members are deeply involved in their own disciplines, Faculties, institutions and organizations. Core functions will continue to be maintained at the present location of SiG@Waterloo until the expiration of the current lease. Over the next three years, required space off and/or on campus will be discussed and confirmed for subsequent years.

9. Financial Resources

9.1. Operating Budget
Listed below is the annual operating expenses budgeted and fully funded through a grant from the J.W. McConnell Foundation for 2010-11 and 2011-12.

<table>
<thead>
<tr>
<th>Budget item</th>
<th>Annual Expense</th>
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<tbody>
<tr>
<td>Salaries and Benefits</td>
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<tr>
<td>Institute Director</td>
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<td>Assoc. Director, Programs &amp; Partnerships</td>
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<tr>
<td>Office Manager</td>
<td></td>
</tr>
<tr>
<td>Program Coordinator</td>
<td></td>
</tr>
<tr>
<td>Communication/Events Coordinator</td>
<td></td>
</tr>
<tr>
<td>External Consultants (Web Accounting, etc)</td>
<td></td>
</tr>
<tr>
<td><strong>Total: Salaries and Benefits</strong></td>
<td>500,000</td>
</tr>
<tr>
<td>Travel</td>
<td>30,000</td>
</tr>
<tr>
<td>Supplies, Communication, Equipment</td>
<td>30,000</td>
</tr>
<tr>
<td>Graduate Students</td>
<td></td>
</tr>
<tr>
<td>Honorariums</td>
<td>126,000</td>
</tr>
<tr>
<td>Expenses, Travel</td>
<td>6,000</td>
</tr>
<tr>
<td>Professional Development</td>
<td>10,000</td>
</tr>
<tr>
<td><strong>Total: Graduate Students</strong></td>
<td>142,000</td>
</tr>
<tr>
<td>Convening SiG National Partners</td>
<td>5,000</td>
</tr>
<tr>
<td>Programming</td>
<td></td>
</tr>
<tr>
<td>Graduate/Professional Curriculum Design Support</td>
<td>(Convene focus groups, marketing, technical consultation for online module delivery)</td>
</tr>
<tr>
<td>Workshop Series Development</td>
<td></td>
</tr>
<tr>
<td>University Innovation/Knowledge Integration</td>
<td></td>
</tr>
</tbody>
</table>
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

<table>
<thead>
<tr>
<th>Scenario Thinking Exercise/Experiments</th>
<th>117,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Study Development/Publishing Activities</td>
<td></td>
</tr>
<tr>
<td>Youth Initiatives</td>
<td></td>
</tr>
<tr>
<td><strong>Total: Programming</strong></td>
<td><strong>117,500</strong></td>
</tr>
<tr>
<td><strong>Contingency</strong></td>
<td><strong>30,000</strong></td>
</tr>
<tr>
<td><strong>UW Administration Fee</strong></td>
<td><strong>87,250</strong></td>
</tr>
<tr>
<td><strong>Annual Total</strong></td>
<td><strong>941,750</strong></td>
</tr>
</tbody>
</table>

Expenses for the subsequent five years of the Institute's operation (i.e., 2012·13 to 2017·18) are anticipated to remain similar but to evolve and change as the work of the Institute continues to develop. The University will assume the salary and benefit costs for Dr. Westley at the completion of the McConnell grant; UW staff complements and programming expenses are dependant upon funding and therefore will be reviewed within the next two years. The Institute will seek funding to cover expenses for subsequent years of operation, from foundations, government agencies, and the private sector.

9.2. Strategies for Long-Term Sustainability

As part of the planning and development activities associated with SIG@Waterloo and its evolution into the Waterloo Institute for Social Innovation and Resilience, strategic plans have been evolving related to long-term financial support in collaboration with both the SiG National Partnership and the UW Development Office. Plans for on-going and active exploration of long-term financial support of the Institute are already underway. Established and evolving relationships with high potential for a financial partnership include the following:

- On-going, close connection with the McConnell Foundation who have now set 'social innovation' as the cornerstone of their foundation's activities
- Series of conversations and shared event participation with SSHRC staff and senior administration – SSHRC President, Chad Gaffield, is very aware of SiG@Waterloo and has recently asked to meet with Dr. Westley in Spring '10
- Series of conversations and shared event participation with HRSD senior staff, centering on their interest in education and university-community partnerships for social innovation

10. Statements of Sanction and Commitment

SIG@Waterloo has been operational since September 2007 and the formal relationships that already exist with the Library and other UW service departments, and any additional support requirements will continue for the new Institute. Letters of support have been received from:

Ken Coates, Dean of Faculty of Arts
Deep Saini, Dean of Faculty of Environment
Tim Draimin, Executive Director of Social Innovation Generation

See Appendix C for full letters of support.
Appendix A: Short Biographies of Initial Senior Staff and proposed slate of Executive Committee Members

Director - Frances Westley is JW McConnell Chair in Social Innovation at University of Waterloo, where she heads up Social Innovation Generation (SiG), a national initiative designed to build capacity for social innovation in Canada. Before joining University of Waterloo in 2007 she was Director of the Gaylord Nelson Institute for Environmental Studies at University of Wisconsin, Madison. She also held the position of the James McGill Professor in Strategic Management at McGill University’s Desautel Management School, where designed and directed an MA program in National Voluntary Sector Leadership and the McGill Dupont Program for Social Innovation. Her research, writing, and teaching centers on social innovation in complex problem domains, with particular emphasis on leadership and managing strategic change. She has published widely in the areas of social innovation, building resilience of linked social-ecological systems, new forms of knowledge generation, managing uncertainty and change in high-risk situations, multi-stakeholder collaborations, and visionary leadership. In 2004 she published Experiments in Consilience (Island Press), which focused on the dynamics of inter-organizational and interdisciplinary collaboration in the management of ecological and conservation challenges. Her most recent book entitled Getting to Maybe (Random House, 2006) focuses on the interrelationship of individual and system dynamics in social innovation and transformation. She serves on numerous editorial and organizational boards including: Ecology and Society, Journal of Applied Behavioral Science, Stockholm Resilience Center, CBSG/IUCN, Evergreen, National Advisory Board NSFLTER. She has worked extensively internationally, designing and facilitating workshops for science-based conservation and in management innovation. Dr. Westley received her PhD and MA in Sociology from McGill University and her BA in English Literature and Fine Arts from Middlebury College, Vermont.

Associate Director – Cheryl Rose has an extensive background in both local and national leadership initiatives enhanced her role as the Citizenship and Leadership Educator and Community Service-Learning (CSL) Specialist on the University of Guelph campus, where she developed four national award-winning programs and research projects. She was the founding Executive Director of the Canadian Alliance for Community Service-Learning and for more than three years, she encouraged the development of post-secondary courses and programs across Canada to facilitate effective teaching and research partnerships between academics and social sector agencies. In 2007, she joined Social Innovation Generation at the University of Waterloo, directing Partnerships and Projects for this new national initiative. As a key member of this collaborative, she works closely with Dr. Frances Westley for strategic program, network and communication development.

Cheryl holds a Masters of Science degree in Capacity Development and
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

Extension Studies, and she presents widely on Leadership for Social Innovation, Enhancing Individual and Organizational Resilience, and Creating Effective Networks. She is a founding and/or contributing member on a number of regional and national committees, including Community-Based Research Canada and Community Innovations Project, an innovative initiative to strengthen social sector systems in Waterloo Region.

**Proposed Inaugural Executive Committee members**

Chaired by George Dixon, VP Research, University of Waterloo

**Political Science Proposed Rep: Carin Holroyd** is associated with SiG@Waterloo as well as an Assistant Professor in the Department of Political Science, University of Waterloo. She is a Senior Fellow, Centre for International Governance Innovation and a Senior Research Analyst with the Asia-Pacific Foundation (based in Vancouver, B.C.) Carin previously taught at universities in Canada, New Zealand and Japan. She has been co-President of the Japan Studies Association of Canada and is one of the coordinators of the 2008 Japan Studies Association of Canada Conference, slated for Waterloo in October 2008. Dr. Holroyd's field of research interest includes government-business relations, Canada-Japan relations, international trade and national innovation policies.

**WICI Proposed rep: Thomas Homer-Dixon** holds the Centre for International Governance Innovation Chair of Global Systems at the Balsillie School of International Affairs in Waterloo, Canada, and is a Professor in the Centre for Environment and Business in the Faculty of Environment, University of Waterloo. He is the founding Director of the Waterloo Institute for Complexity and Innovation.

He was born in Victoria, British Columbia and received his B.A. in political science from Carleton University in 1980 and his Ph.D. from MIT in international relations and defense and arms control policy in 1989. He then moved to the University of Toronto to lead several research projects studying the links between environmental stress and violence in developing countries.

Recently, his research has focused on threats to global security in the 21st century and on how societies adapt to complex economic, ecological, and technological change. His books include The Upside of Down: Catastrophe, Creativity, and the Renewal of Civilization (Knopf, Island Press, 2006), which won the 2006 National Business Book Award, The Ingenuity Gap (Knopf, 2000), which won the 2001 Governor General's Non-fiction Award, and Environment, Scarcity, and Violence (Princeton University Press, 1999), which won the Caldwell Prize of the American Political Science Association.

**Centre for Knowledge Integration Proposed Rep: Edward Jernigan** has been interested in biomedical applications in Systems Design Engineering throughout his career, primarily in the application of vision and image processing systems to medical image analysis, interpretation and diagnosis, but he has also been involved with projects in eye movement analysis for vision diagnostics, image
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

enhancement for low vision patients, artificial vision systems and vision models. Recent projects include wavelet based medical image enhancement and compression, and the development of a content-based image archiving and retrieval system for medical image databases. He collaborates with researchers in optometry and with industry.

He founded the Vision and Image Processing research group in the Department of Systems Design Engineering in 1980, and he is the Director of the Centre for Knowledge Integration at the University of Waterloo.

Environment Resource Studies Proposed Rep: Dan McCarthy is associated with SiG@Waterloo as well as an Assistant Professor in Environment Resource Studies and the School of Environment, Enterprise and Development (SEED), University of Waterloo. He has strong research interests and partnerships that relate to fostering adaptive capacity for Community-based Natural Resource Management, working closely with Mushkegowuk Cree First Nations in James Bay. Other research that explores stewardship, livelihoods and learning is connected to the Long Point World Biosphere Reserve and the Oak Ridges Moraine. Dan is a current board member on Centre for Community Mapping (COMAP) at the University of Waterloo and the Save the Oak Ridges Moraine (STORM) Coalition.

Fellowships in Social Innovation Proposed Rep: Michele-Lee Moore is a PhD candidate in Global Governance at the Balsillie School of International Affairs and a McConnell Fellow at SiG@Waterloo. Her research interests include global environmental governance, networks, social innovation, and the mobilization of different forms of scientific knowledge into policy and practice. Previously a water strategy advisor for the Government of British Columbia, Michele-Lee completed her MSc at the University of Victoria. She has been a McConnell Fellow in Social Innovation, part of the SiG@Waterloo project, since 2008.

School of Accounting and Finance Proposed Rep: Dr. Mark Weber is associated with the SiG project and is an Assistant Professor in the School of Accounting and Finance and School of Environment, Enterprise and Development (SEED) at the University of Waterloo. His research interests include cooperation, trust, the social facilitation of leadership, negotiations, the role of values in decision-making, and social and organizational identity processes. He recently joined UW faculty after 7 years at the University of Toronto and Rotman School of Management.
School of Environment, Enterprise and Development Proposed Rep: 
Dr. Olaf Weber is an Associate Professor at the School for Environment, 
Enterprise and Development (SEED), University of Waterloo. He holds the Export 
Development Canada Chair in Environmental Finance. His interests are in the 
area of environmental and sustainable finance with a focus on sustainable credit 
risk management, socially responsible investment, and the link between 
sustainability and financial performance of enterprises. Before, he was head of 
the Sustainable Finance Group at the Swiss Federal Institute of Technology 
Zurich, Switzerland and managing partner of GOE, Switzerland.
Appendix B: List of Current and Forthcoming publications

White Papers - published
Surmountable Chasms: The Role of Cross-Scale Interactions in Social Innovation - Moore & Westley
This working paper explores the critical question of whether and how networks help facilitate innovations that address complex problems, create change across scales and thereby, create resilience. Complex problems, from homelessness and poverty to mental health, are exceedingly difficult to address, particularly since they rarely have a definition that is consistent across the sectors and scales that they affect. Due to the cross-cutting nature of networks, individuals or groups may find it difficult to be motivated or to believe that their actions can make a difference. By examining institutional or system entrepreneurship, through case studies and examples, this paper proposes that agency within networks requires specific skills from entrepreneurs, including the capacity to: enable knowledge brokering, span boundaries, generate and recognize patterns, drive strategic content and energize the network as a whole.

Resilience and Positive Disintegration in Mental Health Systems – Robinson & Westley
This working paper draws on Kazimierz Dabrowski’s theory of positive disintegration as well as theories of resilience, to propose a new interpretive framework for understanding mental illness. In the last 50 years, increases in the effectiveness of pharmacological drugs have dramatically increased the manageability of symptoms, resulting in a psychopharmacological approach that has come to dominate. However, we argue that the psychopharmacological approach is a simple approach to a complex problem and that resilience suggests the limitations of the model. Expanding this interpretive framework to include multilevel systems, that include variability and regulation through change, can help us to understand and respond to the complexities inherent in the mental illness system.

Making a Difference: Strategies for Scaling Innovation for Greater Impact – Westley & Antadze
This paper explores the strategies and dynamics of scaling up of social innovations for greater social impact. Included is a definition of social innovation and its relationship to complex environments and systems, as well as an exploration of the related concepts of social enterprise and social entrepreneurship. The model of scaling up as simply requiring ‘more’ (or the market model), is questioned and deemed unreliable in understanding the complex nature of social innovation. Rather, readers are offered a distinctive model of systems transformation for consideration; and introduced to a variety of key roles within these transformative environments, including that of the institutional entrepreneur, individuals whose perspectives, skills and relationships are critical elements for significant and durable social change.
Case Studies - published
Knowledge Generation: Community-University Research Partnerships - Dilts & Westley
This case study and attached teaching notes were created from a series of interviews and the subsequent integration of multiple perspectives on both sides of community-university research projects. The issues, opportunities and challenges raised by community organizations, academic researchers and project funders underline the complexity of such cross-sector collaborations. Common problems and questions that emerged from the interviews are highlighted; these focus generally on such aspects as role definition and the effective management of expectations, control issues and communication. In addition, included is a list of practical recommendations for developing more meaningful research partnerships with increased potential for impact that is mutually beneficial.

The Case of the Registered Disabilities Savings Plan, Canada - Westley & Antadze
This case study of the journey to establish the Registered Disability Savings Plan (RDSP), reviews the nature of complexity and inter-relationship as it applies to social innovation. The RDSP is a real-life Canadian innovation and this fascinating story offers lessons for anyone interested in widespread social change, or for those interested in how new financial mechanisms can be used to achieve positive social impact. This case study provides an illuminating look into the years of exploration and creative collaboration that resulted in a major Canadian bank offering the RDSP for the first time in 2008.

Case Study: The Great Bear Rain Forest Story –Tjornbo, Riddell & Westley
The Great Bear Rainforest campaign has made a huge impact on the province of British Columbia in the last twenty years. It is a process that is still ongoing, but which must now be acknowledged to have enjoyed huge success. Radical shifts have taken place throughout the social, ecological and economic systems of the area, empowering new groups of actors, creating new decision making processes, allowing for the emergence of new approaches in resource management, and bringing significant new sources of funding to the area. As such, it is a noteworthy example of social innovation and shows us how social innovation can provide a means for tackling the highly complex and critical problems societies are increasingly coming to face around the globe.

Additional documents
A Primer on Case Study Writing – Tjornbo & Westley
Complexity and Convergence: How Intertwining Roles and Interests Create Conditions for the Success of a Social Innovation – Dilts & Westley
The Social Innovation Dynamic – Westley

White Papers (in process)
White Paper on Social Finance - Gobey
White Paper on Policy and Social Innovation – Holroyd, Moore and Tjornbo
White Paper on Scale in Social Innovation – McCarthy, Riddell, Moore, Robinson
White Paper on Design in Social Innovation – Dwyer and Robinson
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

Other publications (in process)
"Institutional Entrepreneurship and Resilience" - Westley, Tjornbo, Olsson, Folke, Brodin, Schultz and Cronin
"Owning the Shadow; the Role of Personal Transformation in Social Innovation"
   In the forthcoming book “Incubating Research on Positive Social Change”.

Submissions for Journal Publication (in process)
"Crossing the Chasm" Ecology and Society - Moore and Westley
"Making a Difference" Journal for Social Entrepreneurship - Westley and Antadze
"Navigating the back loop: Fostering social innovation and transformation in ecosystem management" Ecology and Society - Biggs, Westley and Carpenter
"Resilience and Positive DisIntegration in Mental Health Systems" Ecology and Society - Westley and Robinson
"From Total Innovation to System Change: The Case of the Registered Disability Savings Plan, Canada" Stanford Social Innovation Journal - Antadze and Westley
"The Lens, The Loop and The Learning", special journal issue of Skoll Center for Social Entrepreneurship.
Appendix C: Letters of Support

April 6, 2010

Senate Executive Committee
University of Waterloo
200 University Avenue West
Waterloo, Ontario
N2L 3G1

Dear Committee Members,

I am delighted to provide a strong endorsement of the application of Social Innovation Generation for "centre" status at the University of Waterloo. SIG is a remarkable enterprise, drawing academics, NGOs, activists, donors, community leaders and others together to tackle the most challenging issues of our time. The SIG initiative is at the same time highly theoretical and conceptual and intensely practical. While drawing on insights from the academic literature on complexity, social movements, resilience, political change, leadership and social transformation, SIG also works directly on such fundamental issues as climate change and mental health.

SIG is best structured as a research centre, as its work spans any disciplines and most Faculties on campus. It has already sponsored a series of superb conferences, retreats and workshops, has worked with regional residents on an innovative scenario planning exercise, and has proven to be a valuable resource for many non-profit and community-based organizations. At the same time, SIG has produced excellent scholarship relating to social innovation and is attracting first-rate academics into its intellectual orbit. SIG offers an exciting model for social engagement and for research relating to the processes involved in sparking, monitoring and understanding the dynamics of system change. I am confident that the SIG Centre will, in the years to come, maintain its standing as an international focal point for research on social innovation and will continue to re-enforce the reputation of the University of Waterloo for top flight scholarship and active engagement with society at large.

I am, therefore, very pleased to support this proposal and will continue to work with the scholars and organizations associated with the Social Innovation Generation unit to ensure its ongoing success.

Sincerely yours,

[Signature]

Dr. Ken S. Coates
Dean, Faculty of Arts and Professor of History

KSC/sdc
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

March 11, 2010

Dr. George Dixon
Vice President, University Research
University of Waterloo

Dear Dr. Dixon:

I am delighted to offer my enthusiastic support to Dr. Westley’s initiative to create the Centre for Social Innovation and Resilience within the Faculty of Environment. Dr. Coates (Dean of Arts) and I are in full agreement that this is the most effective way to build on the strengths of Social Innovation Generation (SiG), which is currently housed with the Faculty of Arts.

The new Centre for Social Innovation and Resilience will provide a superb platform for collaboration between Environment’s and Arts’ faculty, students and staff and the Centre. In particular, I emphasize the importance of the strong connections that will be created between the proposed Centre and three key units in the Faculty of Environment that have complementary orientations: the Centre for Knowledge Integration, the School of Environment, Enterprise and Development, and the Department of Environment and Resource Studies.

On behalf of the Faculty of Environment, I would like to reiterate my enthusiastic endorsement of the proposal to create the Centre for Social Innovation and Resilience within the Faculty of Environment. Please do not hesitate to contact me if you require clarification or additional information.

Sincerely,

H. Deep Saini
Dean

cc. Frances Westley, Director, Social Innovation Generation
Rob de Loë, Associate Dean Research, Faculty of Environment
Proposal to Establish the Waterloo Institute for Social Innovation and Resilience

Attention: University of Waterloo, Senate Graduate and Research Council

Dear Council Members,

On behalf of the Social Innovation Generation (SiG) national partnership, I wish to convey my full support for the creation of the Centre for Social Innovation and Resilience at the University of Waterloo. The University of Waterloo has been a key partner in the ongoing SiG collaboration and our efforts to address Canada’s social and ecological challenges by creating a culture of continuous social innovation. As a collaboration, our ultimate goal is to support whole system change through changing the broader economic, cultural and policy context in Canada to allow social innovations to flourish. Our University of Waterloo node, SiG@Waterloo, plays a key role in generating new knowledge and in educating various players about the complexity of our world and how to design strategic interventions for significant social change.

Over the past two years, SiG@Waterloo has made meaningful connections with the social innovation interests evident at the Public Policy Forum of Canada and the Policy Research Initiative, as well as the Canadian Index on Well-Being. A further example of their demonstrated capacity for impact, are their well-researched and written case studies which have supported our efforts to educate and advocate for a national social finance strategy. The further formalization of a social innovation research and education agenda at the University of Waterloo through the establishment of a Centre will not only raise the profile of social innovation in Canada, but will positively affect the attainment of our collective goals and enhance relationships with a variety of key national and international partners.

We are excited to witness the evolution of the SiG node to an increasingly relevant and institutionalized entity at the University of Waterloo. This would seem in keeping with your university’s reputation as the most innovative in the country! I, and all of our SiG partners, encourage your approval and support of the creation of the Centre for Social Innovation and Resilience and we sincerely look forward to our continued relationship with the University of Waterloo.

With Best Wishes,

Tim Draimin
Executive Director, Social Innovation Generation
tim@sigeneration.ca

April 27, 2010
Senate Undergraduate Council met on October 12, 2010 and agreed to forward the following items to Senate for approval and information, as indicated below [further details may be obtained at: www.secretariat.uwaterloo.ca/Committees/senate/ugc.htm].

FOR APPROVAL

CALENDAR DATES

1. Motion: Council recommends approval of the 2011-12 calendar dates as provided in attachment #1.

UNDERGRADUATE ADMISSION REQUIREMENTS

2. Motion: Council recommends approval of the undergraduate admission requirements for 2012 as detailed in attachment #2.

NEW ACADEMIC PLANS  [effective September 1, 2011]

Faculty of Mathematics
Mathematical Optimization
Operations Research Specialization and Business Specialization

3. Motion: To create two new specializations as provided below:

a) Operations Research Specialization

   All of
   CO 351 Network Flow Theory
   CS 234 Data Types and Structures
   STAT 331 Applied Linear Models
   STAT 333 Applied Probability
   (if CO 355 is taken, CO 351 may be replaced by one of CO 450-471)

   Two of
   AFM 102 Introduction to Managerial Accounting
   ECON 102 Introduction to Macroeconomics
   MSCI 311 Organizational Design and Technology
   MSCI 432 Production and Service Operations Management

   One additional course chosen from
   AMATH 250 Introduction to Differential Equations
   CO 487/CM 432 Applied Cryptography
   CS 338 Computer Applications in Business: Databases
   CS 430 Applications Software Engineering
   STAT 332 Sampling and Experimental Design
   STAT 433 Stochastic Processes
   STAT 435 Statistical Methods for Process Improvements
   STAT 443 Forecasting

   Five additional non-math courses (2.5 units).
   Two additional math courses (1.0 units).
   Four additional free choice courses (2.0 units).

b) Business Specialization

   All of
   ACTSC 371 Corporate Finance 1
AFM 102 Introduction to Managerial Accounting  
BUS 111W Introduction to Business Organization  
BUS 121W Functional Areas of the Organization  
BUS 352W Introduction to Marketing Management  
BUS 481W Business Policy  
CS 338 Computer Applications in Business: Databases  
ECON 102 Introduction to Macroeconomics  
MSCI 432 Production and Service Operations Management  
STAT 371 Statistics for Business 1  
STAT 372 Statistics for Business 2  

Two additional courses chosen from  
AMATH 350 Differential Equations for Business and Economics  
BUS 435W Supply Chain Management  
BUS 445W Information Systems for Supply Chain Management  
BUS 455W Information Systems for Supply Chain Management  
BUS 485W Environmental Management for Operations  
CM 461/STAT 440 Computational Inference  
CM 462/STAT 442 Data Visualization  
CM 464/STAT 444 Statistical Learning - Function Estimation  
CS 230 Introduction to Computers and Computer Systems  
CS 234 Data Types and Structures  
MSCI 311 Organizational Design and Technology  
MSCI 421 Strategic Management of Technology  
MSCI 423 Managing New Product and Process Innovation  
MSCI 436 Decision Support Systems  
STAT 435 Statistical Methods for Process Improvements  

Five additional free-choice courses (2.5 units).  

Notes  
1. The Mathematical Optimization Business Specialization cannot be combined with any other business or accounting plan.  
2. Students may replace the computer science courses listed above with the corresponding courses available to honours computer science major students.  

Rationale: The addition of the Business Specialization aligns the plan more closely with the already popular math/business plan. It is expected that more students will now see this area as attractive. The Operations Research Specialization is designed for more mathematically oriented students; those who may be considering graduate school or who are interested in a double major with another math faculty departmental major.  

ACADEMIC PLAN CHANGES  

Faculty of Engineering  [effective September 1, 2011]  
BASc and BSE Specific Degree Requirements  

Promotion  
4. Motion: To approve the changes to these degree plan requirements as provided below:  

To modify the 1A rules so that 1A students have the same requirements as upper year students (60% average and up to two failures). Lower averages will result in repeat term, or worse. In addition, to modify the promotion rules to allow students to take a combination of reduced load terms, thereby completing 1A in two partial terms.  

Rationale: In winter 2009 a Faculty of Engineering taskforce on first year performance reported with 25 recommendations as to how the faculty could improve the success of first year students. A
key point of several of these recommendations was to alter promotion rules. Currently, the faculty has a safety net for 1A students that is based on the experience that, in the past, some students had difficulty transitioning to university. The current promotion rules provide for progression even with an average lower than in upper years. The proposed change makes the requirements consistent through all years.

In the years following the double cohort it became clear that the students’ needs had changed. In addition, it was determined that there were more students arriving with various special needs. As a result, the proposed changes will permit students to take their 1A term as two partial load terms. This is a major step for engineering with respect to the cohort model of progression. In the past, students who may have wanted to drop one or two courses to focus on the remainder had to be told that only a full load was possible. This could lead to failing one term and passing it the next time. With these changes a student will be able to drop up to two courses, be successful in the remaining courses and then come back and take the dropped courses (and a study skills course) to complete 1A. That is, the student will have only passing terms on his/her record rather than a failed first term.

Management Engineering [effective September 1, 2011; and as provided in rationale below]

5. Motion: To approve the changes to this degree plan as provided below:

The proposed changes:

i. Workload adjustment: move MSCI 444 from 2B to 3A and MSCI 346 from 3A to 2B in order to expose students to database systems before designing information systems in MSCI 444.

ii. Introduce a more design-oriented course with a lab component in the core program by replacing MSCI 432 with MSCI 334 in the 3A term.

iii. Remove the lab component of MSCI 332 to reduce the lab load in the 3B term which currently has three labs. A new course, MSCI 334, introduced in the 3A term will have a lab component to make up for this.

iv. The 4A core course MSCI 453 is inactivated and replaced with a new course MSCI 445.

v. A 4B core course MSCI 423 is removed from core and added to the elective list 2 and an elective is then added to the 4B term.

vi. The introduction of additional electives to the upper year of the program, and revisions to elective lists 1 and 2.

Rationale: Preparation for an accreditation visit revealed issues with the program which the proposed changes address. The addition of electives in the upper year of the program will help students find more conflict-free courses and provide a wider array of elective choices. Although the changes are proposed for the 2011-2012 calendar, implementation is desired as follows: items i, ii and revisions to elective list 1 will affect the cohort who entered in 2009 and onward; item iii will affect the cohort who entered in 2008 and onward; items iv, v, and vi will affect the cohort who entered in 2007 and onward.

Faculty of Mathematics [effective September 1, 2011]
Renaming Operations Research to Mathematical Optimization & revision to plan requirements

6. Motion: To change the name of the operations research plan to mathematical optimization and revise the plan’s requirements as provided below [bold = new text; strikeout = deleted text]:

Mathematical Optimization

In conjunction with the common degree requirements in Table I in “Degree Requirements,” this plan requires at least 26 math courses. These overall requirements must include the faculty core courses outlined in Table II in “Degree Requirements” and the following courses:

One of CO 250/CM 340 Introduction to Optimization
CO 355 Mathematical Optimization

All of

MATH 237 Calculus 3 for Honours Mathematics or MATH 247 Calculus 3 (Advanced Level)
MATH 239 Introduction to Combinatorics or MATH 249 Introduction to Combinatorics (Advanced Level)
AMATH 242/CM 271/CS 371 Introduction to Computational Mathematics or CS 370 Numerical Computation
CO 351 Network Flow Theory
CO 370/CM 443 Deterministic OR Models
CS 234 Data Types and Structures
CS 330 Management Information Systems or CS 490 Information Systems Management
STAT 331 Applied Linear Models
STAT 333 Applied Probability
STAT 340 Computer Simulation of Complex Systems
(If CO 355 is taken, one of CO 450 471 may be taken instead of CO 351.)

Four of

AMATH 250 Introduction to Differential Equations
CO 342 Introduction to Graph Theory
CO 367/CM 442 Nonlinear Optimization
CO 372 Portfolio Optimization Models
CO 450 Combinatorial Optimization
CO 452 Integer Programming
CO 453 Network Design
CO 454 Scheduling
CO 456 Introduction to Game Theory
CO 463 Convex Optimization and Analysis
CO 466 Continuous Optimization
CO 471 Semidefinite Optimization
CO 487/CM 432 Applied Cryptography
CS 338 Computer Applications in Business: Databases
CS 430 Applications Software Engineering
CS 432 Business Systems Analysis
STAT 332 Sampling and Experimental Design
STAT 433 Stochastic Processes
STAT 435 Statistical Methods for Process Improvements
STAT 443 Forecasting

All of

AFM 101 Introduction to Financial Accounting
ECON 101 Introduction to Microeconomics
MSCI 211 Organizational Behaviour

Two of

AFM 102 Introduction to Managerial Accounting
ECON 102 Introduction to Macroeconomics
MSCI 311 Organizational Design and Technology
MSCI 432 Production and Service Operations Management

Recommended

ARBUS 302/ECON 344 Marketing: Principles of Marketing and Consumer Economics
BUS 352W Introduction to Marketing Management
SPCOM-223 Public Speaking

(BUS 332W is offered by Wilfrid Laurier's School of Business and Economics.)

Students enrolled in a double honours plan in Computer Science and Operations Research must replace the Computer Science courses listed above with the equivalent courses required by Honours Computer Science major students.

Three additional courses chosen from:

- CO 342 Introduction to Graph Theory
- CO 351 Network Flow Theory
- CO 353/CM 441 Computational Discrete Optimization
- CO 367/CM 442 Nonlinear Optimization
- CO 372 Portfolio Optimization Models
- CO 450 Combinatorial Optimization
- CO 452 Integer Programming
- CO 453 Network Design
- CO 454 Scheduling
- CO 456 Introduction to Game Theory
- CO 463 Convex Optimization and Analysis
- CO 466 Continuous Optimization
- CO 471 Semidefinite Optimization

In addition to the above, students must complete the requirements for one of the specializations.

Note: No course that is used to satisfy the requirements above can be used to satisfy any of the requirements for a specialization.

Rationale: The field of operations research is an important growing area in industry, it is a strength of the faculty and it should appeal to a large number of math/business students, but it has so far failed to accomplish this. The renaming of the plan aligns the plan closer to the already popular math/business plan. It is expected that more students will now see this area as attractive. The specializations are described on page one of this report.

Faculty of Science  [effective September 1, 2011]

Joint Honours Academic Plans with Science

7. Motion: To approve the changes to the science faculty’s joint honours plans as provided below [strikeout = deleted text; underline = new text where other text has been deleted; note: the remaining text is all new]:

Students from any UW faculty outside of the Faculty of Science may elect to pursue a joint honours degree with their home department/ faculty and science. There are two types of joint honours plans with science plans: (1) Joint Honours Arts Major and Science, and (2) Joint Honours X with Science discipline Y, where X can be any non-science honours plan, and Y is one of the four science disciplines (biology, chemistry, earth sciences, or physics).

The requirements listed below apply to all non-science students admitted to the science portion of joint with science plans. Students must meet requirements of both plans as stated in the calendar and should be aware that completion of these plans usually requires more than the normal number of academic terms.

All joint plans must be approved by the Associate Dean of Science and the appropriate undergraduate officer in the student’s home department in the non-science faculty. Note that some joint honours academic plans may not be permissible if there is an excessive amount of double-counting of courses. Students are advised to consult with the appropriate advisors prior to enrollment in courses associated with the joint plan.

Admission to a joint honours academic plan will occur no earlier than year two. Students must be in a satisfactory or better standing in their honours program prior to admission.
Joint Honours Arts Major and Science (BA)
In order to get this degree, a student must complete all of the requirements for an honours BA plus the following requirements for the Faculty of Science with a minimum average of 60% in the required science and mathematics courses.

1. 1.0 unit from the Faculty of Mathematics. The following cannot be counted as credits towards a joint science degree: MATH 103 or any MTHEL courses.

2. Two of the following year one sequences*:
   a) Two 100- or 200-level BIOL courses plus the associated labs;
   b) CHEM 120/123 plus the associated labs;
   c) EARTH 121/122 plus the associated labs;
   d) One of PHYS 111, 121, 115 and One of PHYS 112, 122, 125 PHYS 111/112, or 121/122, or 121/122 plus the associated labs.

3. 4.0 lecture units (8 courses) plus associated labs from biology, chemistry, earth sciences, physics, or science (except SCI 237 and 250) at the 200-, 300-, or 400-level.

4. No more than 1.0 SCI-labelled unit may be used towards the joint degree.

*Note: Any 100-level BIOL courses not required to meet the first-year science requirement will be counted as 200-level BIOL courses, except BIOL 112.

(The joint plan will have to be approved by the Associate Dean of Science and the Undergraduate Officer of the Joint Honours department in Arts.)

This will require a total of 7.0 science lecture units (14 courses) plus any associated lab units for the labs which have to be done but which will not be included in the 7.0 Faculty of Science units.

It would still be possible for a student enrolled in a joint honours arts major and science (BA) plan to earn a minor in any of the science subjects. Thus, a student could get a “BA, Honours X and Science” or “BA, Honours X and Science (Biology Minor).”

It is highly unlikely that the requirements for an honours BA and the joint Science degree could be done in 8 terms.

Joint Honours X with Biology
Admission into this plan requires an overall average of 65% in the student’s home academic plan. Continuation within the joint plan is contingent upon maintaining an overall average of 60% in biology courses, as well as meeting the requirements of their home faculty academic plan.

The successful completion of the Joint Honours X with Biology plan requires the following:

1. CHEM 120, 120L, 123, 123L (or their equivalents)

2. 6.5 BIOL lecture units excluding BIOL 112, 4.0 of which must be at the 300- or 400-level

NOTE: Students may elect to substitute one or two biology courses with CHEM 266/266L and CHEM 237/237L, provided that they are not required courses in their home department/faculty academic plan.

Any BIOL course required for a student’s home department/faculty academic plan cannot be counted toward completion of the biology joint honours plan. If a student’s home academic plan includes CHEM 120, 120L and CHEM 123, 123L as required courses, 7.5 BIOL lecture units will be required to complete the Joint Honours X with Biology plan.

Joint Honours X with Chemistry
Continuation in this plan is contingent upon maintaining an overall average of 60% in the chemistry courses, as well as meeting the requirements of their home faculty academic plan.

The successful completion of the Joint Honours X with Chemistry plan requires the following:

1. CHEM 120, 120L, 123, 123L (or equivalents)

2. CHEM 140L, 209
3. Any two of the following sequences
   a. CHEM 212, 310, 310L, 313, 313L*
   b. CHEM 220, 220L, 221, 224L, 323
   c. CHEM 233, 331, 335L, 357**
   d. CHEM 250L, 254, 350, 350L, 356*
   e. CHEM 264, 265, 265L, 360, 360L

4. Five additional 300- or 400-level CHEM lecture units (2.5 units)

*For sequences “a” and “d”, students are advised to take first-year calculus (e.g. MATH 127 and MATH 128) and first-year physics (e.g. PHYS 111 or 121; and PHYS 112 or 122).

**Students choosing sequence “c” should also choose sequence “e”, because CHEM 264 and 265 are prerequisites for CHEM 233 and 331, respectively.

Joint Honours X with Earth Sciences

Continuation within this plan is contingent upon maintaining an overall average of 60% in the EARTH courses, as well as meeting the requirements of the home faculty academic plan*.

The successful completion of the Joint Honours X with Earth Sciences plan requires the following:

1. EARTH 121, 121L, 122, 122L
2. PHYS 111, 111L or PHYS 121, 121L
3. CHEM 120, 120L, 123, 123L (or equivalents)
4. MATH 127 (or equivalent)
5. STAT 202 (or equivalent)
6. Three of EARTH 123, 221, 231, 232, 235, 238, 260 (1.5 units)
7. Two additional 200-level EARTH electives (1.0 unit)
8. Two 200-level or higher EARTH electives (1.0 unit)
9. Six EARTH 300- or 400-level electives (3.0 units)

NOTE: *This joint plan is not open to students enrolled in geological engineering. Any EARTH course required for a student’s home department/faculty plan cannot be counted towards completion of the joint honours with earth sciences plan, with the exception of the required non-EARTH courses. If a student’s home academic plan requires any of the non-EARTH courses, additional courses must be taken as substitutes and must be approved by an earth sciences advisor.

Joint Honours X with Physics

Admission into this plan requires an overall average of 65% in the student’s home academic plan. Continuation within this plan is contingent upon maintaining an overall average of 60% in the required PHYS courses, as well as meeting the requirements of their home faculty academic plan. In addition, students must have an average of at least 65% in the lecture courses PHYS 121, 122, 124, MATH 114, 127, 128 (or equivalents) in order to continue in this joint plan.

The successful completion of the Joint Honours X with Physics plan requires the following:

1. MATH 114, 127, 128, 227, 228
3. One elective 300- or 400-level PHYS lab (0.25 unit)
4. Three 400-level PHYS courses (1.5 units)

NOTE: Any PHYS course required for a student’s home department/faculty academic plan cannot be counted towards completion of the physics joint honours plan. If a student’s home academic plan includes any of the courses listed above, with the exception of PHYS 121, 122, MATH 114, 127, 128, 227 and 228, additional PHYS courses are required so that a total of 9.0 dedicated lecture units and 2.0 lab units of PHYS courses are taken to complete the Joint Honours X with Physics plan.
Rationale: The revised joint honours plans will allow non-science students to pursue a science discipline and earn a credential more substantial than a minor (typically 5.0 units) in that discipline. The structured requirements described for each discipline emerge following establishment of a solid foundation, which in some cases also includes core subjects from mathematics (e.g., joint X with earth sciences). The proposed plans will satisfy a persistent demand from high-achieving students in other faculties who wish to develop awareness and competency in a science discipline.

CHANGES TO FACULTY REGULATIONS  [effective September 1, 2011]

Faculty of Mathematics
Course Load Policy

8. Motion: To approve the deletion of the mathematics course load policy:

Students with a CAV < 60% or whose excluded units exceed half their non-excluded passed units (such students would normally be on “Academic Probation” or in “Marginal Standing”) are restricted to a course load maximum of 2.25 units for the subsequent academic term.

Rationale: The faculty cannot enforce this regulation, so requests that it be deleted.

Grade Appeals

9. Motion: To approve the deletion of the mathematics grade appeals policy:

A student may find that the grade received for a course is significantly lower than anticipated following the final exam. In this situation, the student may informally ask the instructor to check the calculation of the final grade. If questions concerning a grade cannot be resolved informally, a student may request to have the final exam re-marked by submitting a “Math Faculty Grade Appeal” form to the Mathematics Undergraduate Office. These forms may be obtained from the Mathematics Undergraduate Office. As part of this process, the student may ask to see a copy of his/her final exam.

It should be noted that failing grades are automatically reviewed by the instructor, and in a multisection course the examinations are marked in common by all instructors so that students in all sections are treated on a common basis. Students should be aware that a grade may decrease as a result of a request for a re-mark.

If, following a grade appeal, a student has serious concerns about how his/her grade was assigned, the student should discuss the matter with the Associate Dean for Undergraduate Studies. In such a situation, university Policy 70 permits a student to request a formal reassessment.

Rationale: This regulation does not agree with current practice (grade reassessments are handled under Policy 70), so the faculty requests that it be deleted.

FOR INFORMATION

RE: Motion 5 in the September 20, 2010 report to Senate

From the minutes of the September 20, 2010 Senate meeting:

Late Penalties, Engineering. Senate heard a motion to approve the recommended new text for inclusion in the engineering and architecture section of the undergraduate calendar.

Guild and Hipel.

Following discussion where senators heard various views expressed including that notwithstanding that such information is in engineering regulations and therefore ‘on the books,’ students may overlook such information; late penalties should be made explicit in all course syllabi as has been previously prescribed by Senate; that as many high school students are not familiar with ‘late’ penalties, such penalties need to be clearly communicated; where professors
do not adhere to the foregoing policy, students should not incur a late penalty.

Senate heard a motion to amend the motion to read: “Instructors will specify late penalties in the course syllabus.”


Senate heard a motion to refer motion 5 to Senate Undergraduate Council.

Freeman and Dea. Carried.

With regard to Senate referring this motion back to council, council in turn referred the motion to the Faculty of Engineering.

Academic Program Review Report

Nanotechnology Engineering – See attachment #3.

Curricular modifications

On behalf of Senate, council approved changes to academic plans, new courses, course changes and course inactivations for the faculties of: arts (economics, history, overlapping content table for statistics and research methods courses, peace and conflict studies, political science, Spanish); engineering (chemical engineering, civil engineering, computer engineering and electrical engineering, general engineering, management engineering, management sciences, mechanical engineering, mechatronics engineering, nanotechnology engineering); engineering and mathematics (software engineering); environment (environment and resource studies, environmental studies, international development, planning); mathematics (accounting and financial management, actuarial science, business administration and mathematics double degree, combinatorics and optimization, computational mathematics, computer science, mathematics, pure mathematics, statistics, teaching option); and science (biology, biotechnology/economics, science and business).

New Undergraduate Awards for 2010/11

Entrance Scholarships/Awards/Bursaries:

- Peter Olufemi Adeniyi Entrance Scholarship in Geography & Environmental Management
- Linda Behnke Entrance Scholarship in Mathematics
- Karen Cheng Memorial Entrance Scholarship
- Ivor Chow Entrance Scholarship in Mathematics for Students from Asia
- Lan Wong Chu Entrance Scholarship
- Robert M. Griffin Entrance Award
- Michael Houston Memorial Scholarship
- David Johnston International Student Scholarships
- Dominic Leung Entrance Scholarship
- Project Hero Award
- Devindra Shah Entrance Scholarship in Mathematics

Upper-Year Scholarships/Awards/Bursaries:

- Jeffrey Aho Memorial Award
- AMD Engineering Scholarships
- Sandra Burt Essay Award
- Classical Studies Prize in Visual/Material Culture
- Gage-Babcock 4th Year Fire Safety Award
- David Johnston Waterloo Awards for Refugee Students
- Richard (Rick) Matzeg Memorial Scholarship
- Walter Metzger Memorial Awards
• OARA/Summerhill Award
• Pfizer Interprofessional Health Care Award
• "Proudly She Marched" – Jocelyn Cowan Scholarship
• Catharine Scott Federation Orientation Committee Leader Award
• Spanish and Latin American Studies Outstanding Research Essay Prize
• Judy Wubnig Undergraduate Essay Prize in Philosophy

Athletic Awards:
• Dr. Stephen Garrett Athletic Excellence Award
• Kitchener-Conestoga Rotary Club Athletic Excellence Award

/kjj Geoff McBoyle
October 22, 2010 Associate Vice-President, Academic
Memo

To: Senate
From: Ken Lavigne, Registrar
CC: Carmen Roecker
Date: November 2, 2010
Re: 2011-2012 Calendar Dates

Attached are the proposed dates for 2011-2012. They reflect all specifications in the Guidelines for Establishing Calendar Dates.

Motion: That Senate approve the proposed 2011-2012 calendar dates.
**Academic Calendar Dates, 2011-2012**

The following symbols and abbreviations are used throughout this table:

- **Days of the week:** (M) Monday, (T) Tuesday, (W) Wednesday, (Th) Thursday, (F) Friday, (S) Saturday, (U) Sunday
- **N/A – Not Applicable**

<table>
<thead>
<tr>
<th></th>
<th>Fall 2011</th>
<th>Winter 2012</th>
<th>Spring 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-operative Work Term Begins</td>
<td>Aug. 29 (M)</td>
<td>Jan. 2 (M)</td>
<td>Apr. 30 (M)</td>
</tr>
<tr>
<td>Lectures Begin</td>
<td>Sept. 12 (M)</td>
<td>Jan. 3 (T)</td>
<td>May 1 (T)</td>
</tr>
<tr>
<td>Reading Week</td>
<td>N/A</td>
<td>Feb. 20-24 (M-F)</td>
<td>N/A</td>
</tr>
<tr>
<td>Convocation</td>
<td>Oct. 22 (S)</td>
<td>N/A</td>
<td>June 13-16 (W-S)</td>
</tr>
<tr>
<td>Lectures End</td>
<td>Dec. 5 (M)</td>
<td>Apr. 2(M)</td>
<td>July 25 (W)</td>
</tr>
<tr>
<td>Pre-Examination Study Days</td>
<td>Dec. 6,7 (T,W)</td>
<td>Apr. 3-6 (T-F)</td>
<td>July 26-29 (Th-U)</td>
</tr>
<tr>
<td>On-Campus Examinations Begin</td>
<td>Dec. 8 (Th)</td>
<td>Apr.7 (S)</td>
<td>July 30 (M)</td>
</tr>
<tr>
<td>On-line Class Examination Days</td>
<td>Dec. 9,10 (F,S)</td>
<td>Apr. 13,14 (F,S)</td>
<td>Aug. 3,4 (F,S)</td>
</tr>
<tr>
<td>On-Campus Examinations End</td>
<td>Dec. 22(Th)</td>
<td>Apr. 21 (S)</td>
<td>Aug. 10 (F)</td>
</tr>
<tr>
<td>Grades Due ^</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Co-operative Work Term Ends ^</td>
<td>Dec. 23 (F)</td>
<td>Apr. 27 (F)</td>
<td>Aug. 24</td>
</tr>
<tr>
<td>Teaching days</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Pre examination study days ^</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Examination days</td>
<td>13</td>
<td>13</td>
<td>11</td>
</tr>
</tbody>
</table>

* Actual dates may vary depending on employer or student requirements.
GUIDELINES FOR DETERMINING ACADEMIC CALENDAR DATES

The following are principles and guidelines either formally agreed upon by Senate or adopted as common practice in determining the dates for the academic year.

• That the practice of setting dates for each academic year continues to be an annual exercise.

• That there be no fewer than 12 examination days in the Fall and Winter Terms, and 11 examination days in the Spring Term.

• That there be no fewer than two study days (excluding Saturday, Sunday and holidays) between the end of classes and the beginning of examinations and the university will attempt to schedule a maximum of five study days when possible (including Saturday, Sunday and holidays).

• That there be no fewer than 60 teaching days in a term. A clear rationale for fewer than 60 teaching days must be communicated to Senate at the time calendar dates are approved.

• That attention be given to balancing the number of meets in courses. Where an imbalance may occur because of holidays (e.g., 11 Fridays and 13 Mondays), the last day of classes may use the class schedule for a different day in order to balance the number of meets across all courses.

• That Fall Term classes in September begin on the Monday following the Labour Day Holiday.

• That in the Fall Term no examinations begin beyond December 22.

• That the start date for Winter Term be January 3 when that date falls on a Monday, Tuesday or Wednesday. Otherwise, the start date is the first Monday following January 3. In the event of Monday, January 3 being a declared holiday, the term would begin January 4.

• That the 5-day Winter Reading Week occurs in all Faculties and must begin on the third Monday in February in keeping with an informal agreement with Wilfrid Laurier University and University of Guelph.

• The start date for Spring Term is normally May 1, 2 or 3 when these dates fall on a Monday, Tuesday, or Wednesday. Otherwise, the start date is the first Monday following May 3.

• In calculating teaching days in a term, Saturdays, Sundays and statutory or University holidays are excluded. In calculating examination days, Saturdays which fall within the period are included, whereas Sundays and statutory or university holidays are excluded. One exception to the above, approved by Undergraduate Operations Committee is that normally examinations will not be scheduled on the Saturday which follows Good Friday when that day falls within the examination schedule.

• Grades due dates for on-campus courses are normally scheduled seven days from the date of the final examination. Grades for courses without a scheduled final examination are normally due 14 days after the start of examinations. Grades for Distance Education courses are due on the last date of the grades submission period.

Prepared by:
K.A. Lavigne, Registrar
October 20, 2009 (replaces October 11, 2005)
Memo

To: Senate Undergraduate Council  
(For approval)  

From: Nancy Weiner, Associate Registrar, Admissions  

Date: October 12, 2010  

Re: Undergraduate Admission Requirements for 2012  

For your consideration and approval, changes to the 2012 admission requirements for the following programs:

1. Faculty of Arts:
   Add new program - Honours Global Business and Digital Arts - Regular
   
   2012 admission course requirements:
   
   - Any Grade 12 U English. A final grade of at least 75% is required.
   - Five other U or M courses.
   
   2012 recommended courses:
   
   - Grade 12 U Mathematics of Data Management

   Rationale:
   
   Global Business and Digital Arts program along with the admission requirements was passed at Senate April 20, 2009 and has now received approval by the province. The new program will be launched for new admits beginning in September 2012 entry.

2. Faculty of Environment:
   Knowledge Integration - Regular
   
   Current 2011 admission course requirements:
   
   - Any Grade 12 U English. A final grade of at least 75% is normally required.
   - Any Grade 12 U Science.
   - Any Grade 12 U Mathematics.
   - Three other U or M courses.

   Revised 2012 admission course requirements:
   
   - Any Grade 12 U English. A final grade of at least 75% is normally required.
   - Any Grade 12 U Science. A final grade of at least 75% is normally required.
   - Any Grade 12 U Mathematics. A final grade of at least 75% is normally required.
   - Three other U or M courses.
**Rationale:**
Effective September 2012, the minimum final grade of at least 75% normally required for math and science courses reflects the current practice of admission decisions. The minimum grades in the math and science courses will help to ensure student success in the BKI program.

3. There are no changes for the Faculties of Applied Health Sciences, Engineering (including Software Engineering and Architecture), Mathematics (including Computer and Financial Management), or Science.

4. There are no changes on this chart for Optometry, Pharmacy, or Social Work.

If you have any questions, please do not hesitate to contact me at ext. 32265 or at nweiner@uwaterloo.ca.
Ontario Secondary School Applicants presenting the Ontario High School Curriculum

Ontario secondary school (OSS) students who will be completing the Ontario high school curriculum must present the Ontario Secondary School Diploma (OSSD) including a minimum of six grade 12 U or M courses. These courses must include all required courses as specified for each program.

An overall average of 75% on the best six grade 12 courses including the required courses is normally the minimum for consideration. Higher averages are required for admission to programs in which the demand for places by qualified applicants exceeds the number of places available. The actual minimum averages required for these programs are determined each year on the basis of the number and qualifications of applicants and the number of available spaces.

In some programs, applicants may be considered for early conditional admission based on factors that include their grade 11 academic record, their grade 12 record to date, and other factors noted under "Other Documentation" in the chart.

The University reserves the right to withdraw conditional offers of admission if the applicant fails to meet the requirements specified above or any specific conditions stated on the offer of admission.
Admission Requirements and Recommendations for Year One Programs 2012

<table>
<thead>
<tr>
<th>Faculty/Program</th>
<th>Requirements</th>
<th>Recommendations</th>
<th>Other Documentation</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Applied Health Sciences | All programs require six Grade 12 U or M courses including specified courses. | Undergraduate first-year entry programs: All required courses are OSS Grade 12 U courses unless otherwise specified and must be included in the required set of 6. Required courses are included in the calculation of the admission average. Programs requiring prior university studies: Requirements are as listed. | Information which is used in addition to course requirements is detailed below when applicable. The appropriate information will be requested when an application is acknowledged. | Special consideration is given on the basis of strength in Biology and Chemistry. Those not admitted to the co-op program are automatically considered for the corresponding regular program. The first co-op work term begins in Year Two. |}

| Health Studies | • Biology | • Advanced Functions | Special consideration is given on the basis of strength in Biology and Chemistry. Those not admitted to the co-op program are automatically considered for the corresponding regular program. The first co-op work term begins in Year Two. | |
| Regular and Co-op | • Chemistry | • English (ENG4U) | | |
| | A final grade of at least 70% is normally required in each of the above required courses. | For students considering the Pre-Health Professions Specialization: • Advanced Functions | | |
| | • Additional U or M courses for a total of six | • English (ENG4U) | | |
| | | • Physics | | |

| Kinesiology | • Advanced Functions | | Special consideration is given on the basis of strength in Advanced Functions, Chemistry, and Biology or Physics. Those not admitted to the co-op program are automatically considered for the corresponding regular program. The first co-op work term begins in Year Two. | |
| Regular and Co-op | • Chemistry | | | |
| | • One of Biology or Physics | | | |
| | A final grade of at least 70% is normally required in each of the above required courses. | Admission Information Form (AIF) is required. | | |
| | • Additional U or M courses for a total of six | | | |

| Recreation and Leisure Studies | • Any Grade 12 U English | | Applicants should be aware that, although this is a social science program, courses in research methods and statistics are included in the curriculum. Writing skills are important. Involvement in extracurricular activities is an important factor in admission decisions. Those not admitted to the co-op program are automatically considered for the corresponding regular program. Limited admission to co-op is also available in Year Two. The first co-op work term begins in Year Two. | |
| Regular and Co-op | A final grade of at least 70% is normally required. | • Additional U or M courses for a total of six | | |

| For all students: • one Grade 12 U or M course from Arts, Business Studies, Canadian and World Studies, Classical Studies, French as a Second Language, Interdisciplinary Studies, International Languages, or Social Sciences and Humanities courses | | | |
**Admission Requirements and Recommendations for Year One Programs 2012**

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</thead>
<tbody>
<tr>
<td><strong>Arts (All Programs)</strong></td>
<td>All programs require six Grade 12 U or M courses including a Grade 12 U English.</td>
<td></td>
<td></td>
<td>When the Admissions Committee considers an application individually, it bases its decision on the overall average, the English grade, and information provided on the Admission Information Form. If Grade 12 courses are repeated, the highest grade attained will be used for making admission decisions. Renison University College and St. Jerome's University have the same admission standards as the University.</td>
</tr>
<tr>
<td><strong>Honours Arts Regular</strong></td>
<td>In addition to the requirement for all Arts programs specified above, a final grade of at least 70% in any Grade 12 U English is required.</td>
<td>For Social Science programs such as Anthropology; Economics; Geography and Environmental Management; Political Science; Psychology; Sexuality, Marriage, and Family Studies; Social Development Studies; or Sociology: <em>Mathematics of Data Management</em></td>
<td>Admission Information Form (AIF) is strongly recommended.</td>
<td>Entry to General or Honours major programs, including departmental co-op, occurs following Year One, and is based on academic performance in Year One in relevant courses in the prospective major. Honours Arts Regular is offered through the University of Waterloo, Renison University College, and St. Jerome's University.</td>
</tr>
<tr>
<td><strong>Arts and Business Regular and Co-op</strong></td>
<td>In addition to the requirement for all Arts programs specified above, a final grade of at least 75% in any Grade 12 U English is required.</td>
<td></td>
<td></td>
<td>Selection of the Honours major which is to be combined with Arts and Business occurs following Year One and is based on academic performance in the prospective major in Year One. Honours Arts and Business is offered through the University of Waterloo, Renison University College, and St. Jerome's University. Those not admitted to the Co-op program are automatically considered for the corresponding Regular program.</td>
</tr>
<tr>
<td><strong>Global Business and Digital Arts Regular</strong></td>
<td>In addition to the requirement for all Arts programs specified above, a final grade of at least 75% in any Grade 12 U English is required.</td>
<td><em>Mathematics of Data Management</em></td>
<td>Admission Information Form (AIF) is strongly recommended.</td>
<td></td>
</tr>
<tr>
<td><strong>Social Development Studies Regular Renison University College</strong></td>
<td>In addition to the requirement for all Arts programs specified above, a final grade of at least 70% in any Grade 12 U English is required.</td>
<td><em>Mathematics of Data Management</em></td>
<td>Admission Information Form (AIF) is strongly recommended.</td>
<td>Those not admitted to Social Development Studies in Year One are automatically considered for Honours Arts Regular through Renison University College. Based on academic performance in Year One, admission to General or Honours Social Development Studies at the Year Two level is possible.</td>
</tr>
</tbody>
</table>
## Admission Requirements and Recommendations for Year One Programs 2012

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Undergraduate first-year entry programs:</strong></td>
<td><strong>Undergraduate first-year entry programs:</strong></td>
<td>Information which is used in addition to course requirements is detailed below when applicable. The appropriate information will be requested when an applicant is acknowledged.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All required courses are OSS Grade 12 U courses unless otherwise specified and must be included in the required set of 6. Required courses are included in the calculation of the admission average.</td>
<td>Courses listed are OSS Grade 12 U courses unless otherwise specified and are not required for admission but are recommended because students may find this preparation useful during their university studies.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programs requiring prior university studies: Requirements are as listed.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Arts (Continued)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting and Financial Management - Financial Management Co-op</td>
<td>• Any Grade 12 U English. A final grade of at least 75% is required.</td>
<td>• Grade 12 M Principles of Financial Accounting is strongly recommended</td>
<td>Admission Information Form (AIF) is required if the Accounting and Financial Management Admissions Assignment (APMMA) on the basis of grade 11 final marks and any interim or final grade 12 marks available at the time the AFMAA invite selection occurs. Those selected to complete the AFMAA are invited and expected to come to the University when the Assignment is scheduled. Arrangements will be made for applicants who cannot write the AFMAA on campus. Admission is based on secondary school or any post-secondary school achievement, the results of the AFMAA, and the Admission Information Form. Consideration will be given to admission at the Year Two level for students who have successfully completed the Year One prerequisites.</td>
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<td></td>
<td>• Advanced Functions</td>
<td>• Grade 12 U Mathematics of Data is strongly recommended</td>
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<td>• Calculus and Vectors</td>
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<td>• Three other U or M courses</td>
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<tr>
<td>Accounting and Financial Management - Public Accounting Co-op</td>
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<tr>
<td><strong>Independent Studies Regular</strong></td>
<td>In addition to the requirement for all Arts programs, a final grade of at least 70% in any Grade 12 U English is required.</td>
<td>Autobiographical Letter</td>
<td>Applicants should be capable of doing university-level work on their own and should be planning studies that can be done at the University of Waterloo.</td>
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<tr>
<td>Computing and Financial Management (Co-op)</td>
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<tr>
<td>Computing and Financial Management Co-op</td>
<td>• Advanced Functions</td>
<td>Grade 11 U Introduction to Computer Science</td>
<td>Admission Information Form (AIF) which includes a teacher reference. All applicants are encouraged to write the Euclid Mathematics Contest. Applicants not currently attending an Ontario Secondary School are strongly advised to write the Euclid contest to demonstrate that they have sufficient mathematical background. The Canadian Computing Competition is recommended.</td>
<td>In addition to a strong academic background, other factors considered in the admission process include performance in contests such as the Euclid Mathematics Contest and the Canadian Computing Competition, the number and variety of courses taken, involvement in extracurricular activities in the school and/or the community, and teacher recommendations. Those not offered admission to Computing and Financial Management may be considered for alternative programs in the Faculty of Mathematics.</td>
</tr>
<tr>
<td></td>
<td>• Any Grade 12 U English. A final grade of at least 75% is required.</td>
<td>• Grade 12 M Principles of Financial Accounting</td>
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<td>• One other Grade 12 U course</td>
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<td>• Two other U or M courses</td>
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<tr>
<td>Faculty/Program</td>
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<td>Undergraduate first-year entry programs:</td>
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<td>All required courses are OSS Grade 12 U courses unless otherwise specified and must be included in the required set of 6. Required courses are included in the calculation of the admission average. Programs requiring prior university studies: Requirements are as listed.</td>
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**Engineering (Co-op)**

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<thead>
<tr>
<th>Architecture Co-op</th>
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<tbody>
<tr>
<td>English (ENG4U). A final grade of at least 75% is normally required.</td>
<td>Grade 11 or 12 M Art courses</td>
<td>Interview</td>
<td>Applicants are selected for the interview on the basis of grade 11 marks and any interim or final OSS grade 12 marks available at the time interview selection occurs. Those selected for an interview are expected to come to the University. Admission is based on the results of the interview, the portfolio, the English précis-writing exercise, and secondary school achievement.</td>
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<tr>
<td>Advanced Functions</td>
<td>Independent arts studies</td>
<td>English précis-writing exercise</td>
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<tr>
<td>Calculus and Vectors</td>
<td>Creative and cultural studies such as visual arts and history</td>
<td>Portfolio</td>
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<tr>
<td>Physics</td>
<td></td>
<td>Admission Information Form (AIF) is required</td>
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<tr>
<td>A final grade of at least 70% is normally required in each of these courses.</td>
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<td>Two other U or M courses</td>
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<thead>
<tr>
<th>Chemical Engineering Co-op</th>
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<tbody>
<tr>
<td>Advanced Functions</td>
<td>Grade 11 or 12 M Art courses</td>
<td>Interview</td>
<td>In addition to a strong academic background, other factors which will be considered in the admissions process include involvement in extra-curricular activities in school and/or in the community; evidence of an interest in engineering; and strong performance in mathematics, science, or engineering-related competitions.</td>
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<tr>
<td>Calculus and Vectors</td>
<td>Independent arts studies</td>
<td>English précis-writing exercise</td>
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<tr>
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<td>English (ENG4U)</td>
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<td>A final grade of at least 70% is normally required in each of these courses.</td>
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<td>One other U or M course</td>
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<td>Advanced Functions</td>
<td>Grade 11 or 12 M Art courses</td>
<td>Interview</td>
<td>In addition to a strong academic background, other factors which will be considered in the admissions process include involvement in extra-curricular activities in school and/or in the community; evidence of an interest in engineering; and strong performance in mathematics, science, or engineering-related competitions.</td>
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<td>Independent arts studies</td>
<td>English précis-writing exercise</td>
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<td>Electrical Engineering</td>
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<td>Geological Engineering</td>
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<td>Management Engineering</td>
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<td>Mechanical Engineering</td>
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<td>Mechatronics Engineering</td>
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<td>Nanotechnology Engineering</td>
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<tr>
<td>Systems Design Engineering Co-op</td>
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Admission Requirements and Recommendations for Year One Programs 2012

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<td>Environment</td>
<td>Undergraduate first-year entry programs: All required courses are OSS Grade 12 U courses unless otherwise specified and must be included in the required set of 6. Required courses are included in the calculation of the admission average. Programs requiring prior university studies: Requirements are as listed.</td>
<td>Undergraduate first-year entry programs: Courses listed are OSS Grade 12 U courses unless otherwise specified and are not required for admission but are recommended because students may find this preparation useful during their university studies. Programs requiring prior university studies: Recommendations are as listed.</td>
<td>Information which is used in addition to course requirements is detailed below when applicable. The appropriate information will be requested when an application is acknowledged.</td>
<td></td>
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</table>

Environment and Business Co-op

- Any Grade 12 U English. A final grade of at least 70% is normally required.
- Five other U or M courses

- One Grade 12 U Mathematics
- One Grade 12 U Science
- Grade 12 M Principles of Financial Accounting
- Analyzing Current Economics Issues (where offered)

Admission Information Form (AIF)

Those not admitted to Honours Environment and Business Co-op are automatically considered for Honours Geography and Environmental Management.

The first co-op work term begins in Year Two.

Environment and Resource Studies Regular and Co-op

- Any Grade 12 U English. A final grade of at least 70% is normally required.
- Five other U or M courses

At least one Grade 12 U or M course from each of
- Canadian and World Studies or Social Sciences and Humanities or the Arts
- Mathematics or Science

Admission Information Form (AIF)

In accordance with the trans-disciplinary nature of ERS, we value flexibility and breadth of learning and experience.

Those not admitted to the co-op program are automatically considered for the corresponding regular program.

Limited admission to co-op is also available in Year Two. The first co-op work term begins in Year Two.

Geography and Aviation Regular

- Any Grade 12 U English. A final grade of at least 70% is normally required.
- A Grade 12 U Mathematics. A final grade of at least 70% is required.
- Four other U or M courses

- One or more Grade 12 U or M Geography courses are strongly recommended.
- A second Grade 12 U Mathematics
- Earth and Space Science

Admission Information Form (AIF) Program Briefing Session Transport Canada Category 1 Medical Certification

Those not admitted to Honours Geography and Aviation are automatically considered for Honours Geomatics Regular.

Geography and Environmental Management Regular and Co-op

- Any Grade 12 U English. A final grade of at least 70% is normally required.
- Five other U or M courses

- One or more Grade 12 U or M Geography courses are strongly recommended.
- A Grade 12 U Mathematics
- Earth and Space Science

Admission Information Form (AIF)

Those not admitted to the co-op program are automatically considered for the corresponding regular program.

Limited admission to co-op is also available in Year Two. The first co-op work term begins in Year Two.
## Admission Requirements and Recommendations for Year One Programs 2012

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<tr>
<td><strong>Geomatics</strong></td>
<td>Undergraduate first-year entry programs: All required courses are OSS Grade 12 U courses unless otherwise specified and must be included in the required set of 6. Required courses are included in the calculation of the admission average. Programs requiring prior university studies: Requirements are as listed.</td>
<td>Undergraduate first-year entry programs: Courses listed are OSS Grade 12 U courses unless otherwise specified and are not required for admission but are recommended because students may find this preparation useful during their university studies. Programs requiring prior university studies: Recommendations are as listed.</td>
<td>Information which is used in addition to course requirements is detailed below when applicable. The appropriate information will be requested when an application is acknowledged.</td>
<td></td>
</tr>
<tr>
<td><strong>Regular and Co-op</strong></td>
<td>Any Grade 12 U English. A final grade of at least 70% is normally required. A Grade 12 U Mathematics. A final grade of at least 70% is required. Four other U or M courses</td>
<td>A second Grade 12 U Mathematics. Grade 11 U Introduction to Computer Science is highly recommended. Grade 12 U Computer Science would be an asset.</td>
<td>Admission Information Form (AIF)</td>
<td>Those not admitted to the co-op program are automatically considered for the corresponding regular program. Limited admission to co-op is also available in Year Two. The first co-op work term begins in Year Two.</td>
</tr>
<tr>
<td><strong>International Development</strong></td>
<td>Any Grade 12 U English. A final grade of at least 70% is normally required. At least one Grade 12 U Science or Mathematics course. A final grade of at least 70% is normally required. Four other U or M courses</td>
<td>At least one Grade 12 U course in a second language</td>
<td>Admission Information Form (AIF) is required.</td>
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<tr>
<td><strong>Regular</strong></td>
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<tr>
<td><strong>Knowledge Integration</strong></td>
<td>Any Grade 12 U English. A final grade of at least 75% is normally required. Any Grade 12 U Science. A final grade of at least 75% is normally required. Any Grade 12 U Mathematics. A final grade of at least 75% is normally required. Three other U or M courses</td>
<td></td>
<td>Admission Information Form (AIF) is required.</td>
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<tr>
<td><strong>Regular</strong></td>
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<tr>
<td><strong>Planning Co-op</strong></td>
<td>Any Grade 12 U English. A final grade of at least 75% is required. Five other U or M courses</td>
<td>Grade 12 U or M courses from the following: Canadian and World Studies Mathematics Science, preferably Biology or Earth and Space Science</td>
<td>Admission Information Form (AIF)</td>
<td>Those not admitted to the co-op program are automatically considered for the corresponding regular program. Limited admission to co-op is also available in Year Two. The first co-op work term begins in Year Two.</td>
</tr>
</tbody>
</table>

**Environment (cont'd)**

- Any Grade 12 U Science would be an asset.
Admission Requirements and Recommendations for Year One Programs 2012

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<tr>
<td><strong>Mathematics</strong></td>
<td><strong>Undergraduate first-year entry programs:</strong> All required courses are OSS. Grade 12 U courses unless otherwise specified and must be included in the required set of 5. Required courses are included in the calculation of the admission average. Programs requiring prior university studies: Requirements are as listed.</td>
<td><strong>Undergraduate first-year entry programs:</strong> Courses listed are OSS. Grade 12 U courses unless otherwise specified and are not required for admission but are recommended because students may find this preparation useful during their university studies. Programs requiring prior university studies: Recommendations are as listed.</td>
<td>Information which is used in addition to course requirements is detailed below when applicable. The appropriate information will be requested when an application is acknowledged.</td>
<td>All Mathematics programs are offered through the University of Waterloo and St. Jerome's University. The decision to register at St. Jerome's occurs after admission.</td>
</tr>
<tr>
<td>Computational Mathematics</td>
<td>- Advanced Functions</td>
<td>- Admission Information Form (AIF) which includes a teacher reference. All applicants are encouraged to write the Euclid Mathematics Contest. Applicants not currently attending an Ontario Secondary School are strongly advised to write the Euclid Contest to demonstrate that they have sufficient mathematical background. For those applying to Bioinformatics, Computer Science, Business Administration, and Computer Science Double Degree, the Canadian Computing Competition is recommended.</td>
<td></td>
<td>In addition to a strong academic background, other factors considered in the admissions process include performance in contests such as the Euclid Mathematics Contest and the Canadian Computing Competition, the number and variety of courses taken, involvement in extracurricular activities in the school and/or the community, and teacher recommendations. Those not offered admission to their first choice program will be considered for other Mathematics programs.</td>
</tr>
<tr>
<td>Regular and Co-op Computer Science</td>
<td>- Calculus and Vectors</td>
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<td></td>
<td>The Faculty administers the English Language for Academic Studies (ELAS) program for those with exceptional mathematics skills who do not meet normal English language requirements.</td>
</tr>
<tr>
<td>Mathematics</td>
<td>- Any Grade 12 U English</td>
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<td></td>
<td>Admission to the Mathematics Co-op Teaching Option occurs in Year Two after successful completion of Year One in either Honours Co-op Computer Science or Honours Co-op Mathematics.</td>
</tr>
<tr>
<td>Regular and Co-op Mathematics/Chartered Accountancy</td>
<td>- Advanced Functions</td>
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<td></td>
<td>Honours Business Administration and Mathematics Co-op is a double degree program offered jointly by Wilfrid Laurier University and UW leading to BBA and BMath degrees.</td>
</tr>
<tr>
<td>Co-op</td>
<td>- Calculus and Vectors</td>
<td></td>
<td></td>
<td>Honours Business Administration and Computer Science Co-op is a double degree program offered jointly by Wilfrid Laurier University and UW leading to BBA and BCS degrees.</td>
</tr>
<tr>
<td>Mathematics/Financial Analysis and Risk Management</td>
<td>- Chemistry</td>
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<td>Biotechnology/Chartered Accountancy Co-op</td>
<td>Undergraduate first-year entry programs: All required courses are OSS Grade 12 U courses unless otherwise specified and must be included in the required set of 6. Required courses are included in the calculation of the admission average. Programs requiring prior university studies: Requirements are as listed.</td>
<td>Undergraduate first-year entry programs: Courses listed are OSS Grade 12 U courses unless otherwise specified and are not required for admission but are recommended because students may find this preparation useful during their university studies. Programs requiring prior university studies: Recommendations are as listed.</td>
<td>Information which is used in addition to course requirements is detailed below when applicable. The appropriate information will be requested when an application is acknowledged.</td>
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<tr>
<td>Biotechnology/Economics Co-op</td>
<td>Six Grade 12 U or M include: Service Biology, Chemistry and Grade 12 M Principles of Financial Accounting.</td>
<td>• Biology • Chemistry • Grade 12 M Principles of Financial Accounting</td>
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</tr>
<tr>
<td>Honours Science Regular</td>
<td>• Any Grade 12 U English. A final grade of 70% is normally required.</td>
<td>• Biology • Chemistry</td>
<td>Admission Information Form (AIF) is strongly recommended.</td>
<td>Where an entry program is available in both co-op and regular, those not admitted to co-op are automatically considered for the corresponding regular program.</td>
</tr>
<tr>
<td>Environmental Science Regular and Co-op</td>
<td>• Advanced Functions A final grade of 70% is normally required.</td>
<td>• Chemistry • Earth and Space Science • Physics</td>
<td></td>
<td>In some programs, limited admission to co-op is possible in Year Two.</td>
</tr>
<tr>
<td>Life Sciences Regular and Co-op</td>
<td>• Calculus and Vectors A final grade of 70% is normally required.</td>
<td>• Chemistry • Earth and Space Science • Physics</td>
<td></td>
<td>The first co-op work term begins in Year Two for all Faculty of Science students.</td>
</tr>
<tr>
<td>Physical Sciences Regular and Co-op</td>
<td>Two of • Biology • Chemistry • Earth and Space Science • Mathematics of Data Management</td>
<td>• Chemistry • Earth and Space Science • Physics</td>
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<tr>
<td>Science and Aviation Regular</td>
<td>• Physics One additional U or M course.</td>
<td>• Chemistry • Earth and Space Science • Physics</td>
<td>Admission Information Form (AIF) is strongly recommended. Program Briefing Session. Transport Canada Category 1 Medical Certification</td>
<td>Please refer to the School of Optometry website regarding required and recommended university-level courses.</td>
</tr>
<tr>
<td>Science and Business Co-op (All specializations)</td>
<td>• Chemistry International Business Fundamentals</td>
<td>• Chemistry International Business Fundamentals</td>
<td></td>
<td>Please refer to the School of Optometry website regarding required and recommended university-level courses.</td>
</tr>
<tr>
<td>Optometry Regular</td>
<td>Successful completion of at least three full years of university-level science with specific course requirements.</td>
<td>• Optometry Admissions Test (OAT) • Autobiographical Sketch • Essay • Optometrist and Academic References</td>
<td></td>
<td>Please refer to the School of Optometry website regarding required and recommended university-level courses.</td>
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<td><strong>Pharmacy Co-op</strong></td>
<td>Undergraduate first-year entry programs: All required courses are OSS Grade 12 U courses unless otherwise specified and must be included in the required set of 6. Required courses are included in the calculation of the admission average.</td>
<td>Undergraduate first-year entry programs: Courses listed are OSS Grade 12 U courses unless otherwise specified and are not required for admission but are recommended because students may find this preparation useful during their university studies. Programs requiring prior university studies: Requirements are as listed.</td>
<td>Information which is used in addition to course requirements is detailed below when applicable. The appropriate information will be requested when an application is acknowledged.</td>
<td>Please refer to the School of Pharmacy website regarding admission averages and required university-level courses. Secondary School applicants applying to Honours Science or Honours Life Sciences may also be considered for conditional admission to Pharmacy. Refer to the School of Pharmacy website regarding requirements.</td>
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</table>

| **Social Work** | Successful completion of either a three-year or a four-year undergraduate university degree with a B average and at least 6.0 units in the social sciences, including 10 specified courses from the Renison curriculum or their equivalents. | | Letter of reference and personal statement which demonstrates sufficient practical experience and personal suitability are required. | Please refer to the Social Work website regarding required university-level courses. |

| **Software Engineering (Co-op)** | Advanced Functions, Calculus and Vectors, Chemistry, English (ENG4U), Physics, A final grade of at least 70% is normally required in each of these courses. One other U or M course | Grade 11 U Introduction to Computer Science is highly recommended. Grade 12 U Computer Science would be an asset. | Admission Information Form (AIF). Experience in developing well-structured, modular programs is required, as demonstrated by at least one of the following: (1) strong performance in a programming course such as Grade 11 U Intro to Computer Science or Grade 12 U Computer Science or equivalent, (2) strong performance in a programming contest, such as the Canadian Computing Competition, (3) significant work experience, (4) other (must be explained on the Admission Information Form). | In addition to a strong academic background, other factors which will be considered in the admissions process include involvement in extracurricular activities in school and/or the community; evidence of interest in software engineering, additional OSS Grade 12 courses; and participation in mathematics, science, engineering, or programming competitions. All applicants are encouraged to write the Euclid Mathematics Contest. Those not offered admission to Software Engineering may be considered for alternate engineering programs or for computer science; applicants specify their preferences for alternate programs on their Admission Information Form. |
NANOTECHNOLOGY ENGINEERING

Review Process

This was the first formal review of the undergraduate program in Nanotechnology Engineering. Since the engineering accreditation process overlaps greatly with the undergraduate program review process, the University of Waterloo (UW) used the accreditation review to satisfy the requirements of the undergraduate program review process for the Nanotechnology Engineering program. The program’s self study was submitted November 30, 2008; the site visit was conducted January 17 to 19, 2010; the report of the visiting team on the accreditation visit was received February 3, 2010. Accreditation was granted to Nanotechnology Engineering for three years with a visit in three years.

Characteristics of the Program

Historical Overview

There is no Department of Nanotechnology Engineering. The Nanotechnology Engineering program is a collaboration among three departments – the Department of Chemical Engineering and the Department of Electrical and Computer Engineering in the Faculty of Engineering, and the Department of Chemistry in the Faculty of Science. The leadership for the program is provided by the Nanotechnology Engineering Program Director, normally a faculty member chosen from one of the three sponsoring departments who holds a joint or cross appointment in the other departments. It is fully acknowledged by all stakeholders in the program that the Director must be a licensed professional engineer regardless of the home department. The Nanotechnology Engineering Program Board, comprising the Nanotechnology Engineering Program Director, the Deans of the sponsoring departments, and the Chairs and Undergraduate officers of the collaborating departments, oversees the program operations and evolution. The Board has delegated issues of the program’s operations to the Nanotechnology Operations Committee, and issues of program curriculum content to the Nanotechnology Curriculum Committee.

Faculty members hired to instruct in this program are appointed in one of the sponsoring departments and are evaluated by their home department.

At the time when the self study was written there were 358 students in the program.

Program Objectives

Nanotechnology commonly refers to the design, fabrication, manipulation and exploitation of systems and structures when at least one dimension is on the nanometre length scale (1 to 100nm).

The objective of the Nanotechnology Engineering program is to build the knowledge and skills demanded of graduate engineers by a cluster of industries seeking to capitalize on the unique advantages conferred on a plethora of materials, devices and processes by the ability to control matter at the nanoscale. The program is designed to provide students with the firm grasp of fundamental physical, chemical, and biological aspects of nanoscale systems, as well as with a solid understanding of the principles and practices of engineering design and analysis of materials, devices and processes involving such systems. The Nanotechnology Engineering program seeks to balance multidisciplinary breadth with depth in four main application areas: nanostructured materials, nanoelectrics, nanobiosystems and nanoinstruments.
Distinctiveness/Benchmarking

The Nanotechnology Engineering program is the first of its kind in Canada. Although the program’s administrative home is in the Department of Chemical Engineering its unique set of courses requires equal collaboration between the Departments of Chemical Engineering, Chemistry, and Electrical and Computer Engineering.

Academic Plans Offered:

The Faculty of Engineering offers a BASc co-operative education degree in Nanotechnology Engineering which takes four years and eight months to complete.

Options in this program are: International Studies in Engineering, Management Sciences, and Mathematics and Physics.

In the Engineering accreditation process the Nanotechnology Engineering program has to meet certain levels of accreditation units (AUs) and “Qualified” (Q) AUs. An Accreditation Unit (AU) is defined on an hourly basis for an activity which is granted academic credit and for which the associated number of hours corresponds to the actual contact time of that activity between the student and the faculty members or alternates responsible for delivering the program. One hour of lecture is equal to 1 AU while one hour of laboratory or scheduled tutorial equals half an AU. A QAU refers to one hour of curriculum content in courses that relate to engineering science and/or engineering design delivered by faculty members who are licensed professional engineers (PEng).

The minimum requirements and the actual AUs for each component of the Nanotechnology Engineering program are listed in Table 1.

<table>
<thead>
<tr>
<th>Curriculum Component</th>
<th>Minimum</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>195</td>
<td>251.1</td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>195</td>
<td>397.2</td>
</tr>
<tr>
<td>Mathematics and Natural Sciences Combined</td>
<td>420</td>
<td>648.1</td>
</tr>
<tr>
<td>Engineering Science</td>
<td>225</td>
<td>520.7</td>
</tr>
<tr>
<td>Engineering Design</td>
<td>225</td>
<td>275.8</td>
</tr>
<tr>
<td>Engineering Science and Engineering Design Combined</td>
<td>900</td>
<td>1,027.7</td>
</tr>
<tr>
<td>Complementary Studies</td>
<td>225</td>
<td>448.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,950</td>
<td>2,215.2</td>
</tr>
</tbody>
</table>

Nanotechnology Engineering exceeds the minimum requirements for all the curriculum components. However, with regard to QAUs the program does not meet the minimum requirement of 225 QAUs for engineering design. Its total is 101. This low value is due to the time required for new faculty members to establish their teaching and research programs at the university before proceeding to apply for PEng registration. Of the 14 faculty members who do not have PEng status nine have applied for registration. Within three years the program will easily satisfy the QAU figure for engineering design.
The Nanotechnology Engineering program consists of two four-month work terms and two eight-month work terms of which five four-month work terms are required for graduation. Credit for work term employment is shown on student grade reports as a CR/NCR for a co-op course.

In addition, students have to complete four work terms reports which are recorded on a student’s transcript as a weight of 0.13 for each successful work term report, to a maximum of 0.5.

While on work terms, engineering co-op students have to complete successfully five professional development courses for engineers (PDEng courses). These courses address the following issues: professionalism; communications; problem solving; ethics and equality; individual and team work; economic and project management; and the impact of engineering on society and the environment.

Students

Admission into first year for all UW Engineering programs is undertaken and controlled by the Faculty with the assistance of the Registrar’s Office.

In determining the admissibility of applicants, the following criteria are considered: admission averages; the high school adjustment factor (HSAF); and the admission information form (AIF).

HSAF is intended to account for variations in marking standards between high schools. The adjustment is derived from an eight year rolling average mark drop from grade 12 to first year university (i.e. the 1B term average minus the admission average, averaged over students from a given high school for the previous eight years). This drop, averaged over all Ontario high schools, is approximately 16 per cent, while the approximate range for different high schools is about six to 21 per cent. Data are updated yearly.

AIF is intended to identify students who have a higher probability of success in the program as demonstrated by individual strengths and time management skills. The AIF describes enriched academic activities, honours and awards, athletic activities, employment while a student, community work and other extra-curricular activities. These forms are read and scored by a group of retired engineering professors. A bonus in the range of zero to five points is added to the admission average based on the AIF score.

The target and actual first year enrolment for the first three years of the program is given in Table 2. The steady state total target of 110 students was set to be met in three years. The actual number over the last two years has “settled down” at 99 per cent of target.

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
<th>Actual</th>
<th>% of Target</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C*</td>
<td>I*</td>
<td>Total</td>
</tr>
<tr>
<td>2005/06</td>
<td>95</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>2006/07</td>
<td>102</td>
<td>8</td>
<td>110</td>
</tr>
<tr>
<td>2007/08</td>
<td>100</td>
<td>10</td>
<td>110</td>
</tr>
<tr>
<td>2008/09</td>
<td>100</td>
<td>10</td>
<td>110</td>
</tr>
</tbody>
</table>

*C = Canadian/Permanent Resident; I = Visa Student; T = Total.
The steady state target for visa students is 10; actual numbers have ranged, in the last couple of years, from seven to 11.

Females accounted for 12.4 per cent of the Nanotechnology Engineering students in November 2005. This percentage ranged from 16.9 to 17.2 in the next three years.

Co-op employment for Nanotechnology Engineering students is 100 per cent in the winter and fall terms but falls to between 85 and 90 per cent for the spring term. Over the six four-month work terms between winter 2007 and fall 2008 inclusive, 70 per cent of the jobs were in Ontario, 17 per cent in the rest of Canada, and the remainder, 13 per cent, were outside the country.

On graduation every student has to possess the following 12 outcomes to meet the term “engineer”: a knowledge base for engineering and the ability to: analyse problems; conduct investigations; design solutions; apply appropriate techniques and tools to a range of engineering activities; work effectively as a member and leader in teams; communicate complex engineering concepts within the profession and with society; analyse social and environmental aspects of engineering activities; incorporate economics and business practices into the practice of engineering; apply professional ethics, accountability, and equity; understand the roles and responsibilities of the professional engineer in society; and identify and address their own educational needs in a changing world.

Although no student had graduated from the program as of the submission of the self study, all the above outcomes are addressed in the Nanotechnology Engineering program through the collective activities that students have to undertake in their studies while at UW.

Faculty

The team of faculty members in charge of delivering the Nanotechnology Engineering curriculum is rather diverse in terms of academic background and research expertise. Such diversity is essential to the success of a program as inter-disciplinary as Nanotechnology Engineering. The instructor team expertise ranges from basic sciences (chemistry, biochemistry, physics and mathematics), to aspects of basic science that underpin nanotechnology (quantum and statistical mechanics, surface science etc.), to electrical engineering (transport phenomena, catalysis, materials engineering, modelling and simulation), and biomedical engineering (controlled drug release, targeted drug therapy, nanobiosensors, etc.). There are 42 instructors who teach or have taught at least one course during the last two years that contains engineering science or engineering design content; five are full professors; 12 are associate professors; 15 are assistant professors; one is an emeritus professor; one is a senior lecturer; three are lecturers; and three are graduate students.

Twenty-one tenure track positions have been created to support the program: seven in Chemical Engineering, seven in Electrical and Computer Engineering, and seven in Chemistry. Fifteen of these positions have been filled spanning all levels of seniority and interviews are ongoing for filling the remaining six positions.

Five full professors, four associate professors and three assistant professors, 12 in total, are listed on the web site of the Nanotechnology Engineering program. These faculty members have each averaged $85,000 a year for the last five years in research funding. In addition, an average of 5.4 journal articles a year and 2.1 refereed conference proceedings have been published by each of them over the last six years.
Further, an average of 0.7 patents per year for the last six years has been obtained by each of the 12 faculty members.

**Main Strengths**

The accreditation team considers that the Nanotechnology Engineering is blessed with a number of significant strengths: exceptional student quality; outstanding leadership; an innovative and highly interdisciplinary program; very enthusiastic instructors; and a very strong hands-on student experience with leading edge equipment.

**Concerns and Opportunities for Improvement**

The evaluation team considered 68 criteria under five headings: curriculum content; program environment; faculty members; financial resources; and accreditation procedures. Curriculum content consists of 32 criteria of which 30 were judged to be acceptable but two were marginal. All eight criteria for program environment were acceptable. The faculty members’ section has 17 criteria of which 15 were acceptable and two were judged unacceptable. Lastly, the four and seven criteria of financial resources and accreditation procedures respectively were all considered acceptable.

*Marginal Criterion:* While the program is very broad in items of natural science content, the program in its current form appears to have limited engineering science content beyond the elements of Electrical and Chemical Engineering core to the field of Nanotechnology Engineering.

*Response:* Nanotechnology Engineering contains engineering science content from several distinct engineering disciplines which include, but are not limited to, Chemical Engineering and Electrical Engineering. Engineering science content from the discipline of Mechanical Engineering is also present. Not only does the Nanotechnology Engineering program contain adequate engineering science content from other engineering disciplines, but this content is appropriately integrated, so as to enable engineering design in four main application areas: nanomaterials, nanaelectronics, nanoinstruments and nanobiosystems.

At present, the Nanotechnology Engineering students take virtually no courses in conjunction with students outside their program. To address this issue, and the issue of the lack of breadth in engineering science content, the accreditation team suggests that it would be sensible if Nanotechnology Engineering students were exposed to students in related disciplines through their coursework and projects.

*Marginal Criterion:* Elements of sustainable development and environmental stewardship were noted in the PDEng courses and the Class Professor seminar series. However, the PDEng program is more evaluative than instructive and the Class Professor seminar series was not mandatory for the 2010 graduating class.

*Response:* While evaluative in nature, the PDEng program does require students to demonstrate competency with respect to professional skills in order to receive course credit. A review of the PDEng program has been completed; a Task Force was set up to consider its recommendations; and changes are underway.
A curriculum review concerning the Class Professor seminar series is currently underway. The seminar series will be mandatory for the 2011 graduating class and beyond.

*Unacceptable Criterion:* The 2010 graduating class has 101 AUs of engineering design delivered by licensed instructors. This is less than the 225 units required. Also the amounts of QUAs, for engineering science and engineering design combined, for the 2010 graduating class is 401 which is less than the 600 required. For the 2010 graduating class the total qualified engineering design AUs (140) would also be less than the minimum. The team noted the efforts by several instructors to become licensed, including by those in the Department of Chemistry under a limited license arrangement.

*Response:* The maturation of the faculty members teaching in the Nanotechnology Engineering program and the completion of their licensure requirements will ultimately result in the program meeting all requirements. This expectation is based on the fact that a number of faculty members teaching courses with engineering design content have applied and are already or are expected to be registered by the time they will be teaching these courses.

*Unacceptable Criterion:* The Canadian Engineering Accreditation Board requires that the curriculum committee of any engineering program has a majority of licensed professional engineers. The Nanotechnology Engineering Curriculum Committee has three out of a committee of eight, which does not constitute a majority.

*Response:* The composition of the Nanotechnology Engineering Curriculum Committee has been modified and now has a majority of professional engineers.
DELEGATION OF AUTHORITY TO THE EXECUTIVE COMMITTEE

New Graduate Programs

1. Motion: In the event that Senate Graduate & Research Council approves the following new programs at its November 15, 2010 meeting: Diploma in Social Innovation (School of Environment, Enterprise & Development; Faculty of Environment), Master of Development Practice (School of Environment, Enterprise & Development; Faculty of Environment) and Master of Digital Innovation (Department of Anthropology; Faculty of Arts) and Senate does not meet in December, to delegate authority to the Senate Executive Committee to approve the foregoing new graduate programs on behalf of Senate.

Rationale: These three programs have received the approval of their respective faculty councils and will be considered by Senate Graduate & Research Council at its meeting on November 15, 2010. If the programs are approved in December, they will be submitted to the Ministry of Training, Colleges and Universities in time to begin admitting students for next fall. If they are not submitted in December, it will be another full year until students can be admitted to the programs, which will impact UW’s ability to meet its targets for graduate enrolment.
Proposition for a Games Institute
University of Waterloo

This proposal is for the formation of a Games Institute at the University of Waterloo.

23/09/2010
THE GAMES INSTITUTE

For Research in Games-Driven Content, Technology, and Interactions

1. Overview

This proposal is for a cross-faculty collaborative research institute at the University of Waterloo whose focus is on game-related content (game concepts, graphics, sound, narrative, simulation); technologies (hardware and software); and interactions (social and human-computer interactions). We define "games" here as broadly encompassing video and computer games (including online games), social games, mobile games, educational and serious games, simulations and virtual worlds, more traditional non-digital games, board games and gambling games. The Institute's focus lies with the future of game-related and game-driven design and development across a range of current and upcoming technologies and markets, and will seek national and international partnerships in the fields of games and games-related simulations for medical, informational, entertainment and educational media.

Games are a highly interdisciplinary media and entertainment form, and what we propose spans every Faculty at Waterloo. For instance:

- Faculty of Applied Health Sciences: public policy on gambling or gaming, wellness games, physical fitness games, medical simulation and education games, etc.
- Faculty of Arts: music and sound in games, graphics and animation, psychology of games, VR research, motion capture of dramatic performances, understanding interaction and communication, social interactions, semiotics of games, persuasive games, games and narrative, etc.
- Faculty of Engineering: new hardware development, human-computer interaction, use of game technology for architecture design, software engineering, etc.
- Faculty of Environment: simulations and modelling technologies, using games for public awareness and education, etc.
- Faculty of Math & Computer Science: many areas of computer science, procedural generation algorithms, probability theory, optimization, computer graphics, etc.
- Faculty of Science: educational gaming, simulations, neurobiology of gaming, physics and modelling, etc.

The types of questions that we could explore together as a cross-faculty initiative for instance, are:

- How can we use game technologies (hardware or software) in interactive art?
- How can we use games for better student learning?
- What are the psychological and psychophysiological aspects of gaming that contribute to addiction?
- What aspects of interface design can we learn from games?
- Can we develop an audio physics engine?
- How can machine learning and AI influence new games?
- What new technologies can we develop with that might have game-related applications?
- What modes of interaction do new game technologies afford?
- How can we optimize code for networked mobile games?
• Can we develop a game engine that requires no scripting?
• What security measures do we need to use for networked social games?
• How do we incorporate ideas from board games into new digital technologies?
• What public policy recommendations should be made with regard to games?
• What new critical theories emerge from the multidisciplinary nature of games?
• How does game design influence augmented reality applications?
• How do the social interactions in games influence designs in social media and collaborative applications?
• What are the most effective uses for games in transmedia ventures?
• How does game play affect story reception and thus television and film applications?

As shown, our vision is very broad, incorporating game research that may have non-gaming applications, non-gaming research that may have game-related applications, hardware, software, and interaction.

We envisage an equally open-minded approach to the Institute, in which anyone working in an area that has research links to games could share in our resources (human, financial and technological).

We believe, therefore, that the creation of an Institute will help to foster cross-faculty collaboration on campus and create new interdisciplinary research and teaching opportunities, funding opportunities, external bridges to other academics and to industry, and an exciting place for faculty and students to connect and undertake research.

1.1 Why a Games Institute in Waterloo?

In addition to the reasons outlined above, an overview of the game industry (with a focus on Ontario) will highlight the benefits that an Institute can help to bring to the University and community at large.

The video game industry represents approximately $11.7 billion worldwide (2008 statistic). Although we were unable to find worldwide statistics for board games or slot machines, in the USA board games represent about $870 million a year in sales, and the gambling industry represents about $365 billion a year.

Canada is the third largest centre worldwide in terms of game development, after the United States and Japan. About half of all Canadian households have at least one video game console. The industry in Canada comprises about 250 companies and employs about 14000 people. Ontario has the greatest number of game companies, but accounts for only 14% of employment (most are small companies and start-ups). One important figure to note is the expected growth: "Up to 29 per cent more videogame employees are expected in Canada by 2011, and with Ubisoft opening up shortly in Toronto, they are already suggesting that its headcount will nearly double in the country to 3,000 employees by 2013." In other words, there is a reasonable prediction for growth in Southern Ontario in particular.


and the Province of Ontario's own "Ontario's Digital Gaming Industry: Play to Win" (2009) provide us with very useful information about the industry, summarized here:

- Geographically, much of Canada's entertainment software industry is concentrated in 3 regions: Vancouver, Montreal and the Greater Toronto Area (GTA). It is suggested that the industry tends to have a clustering tendency like that of other tech-based clusters.  
  
- The GTA has the largest number of small companies, which is remarkable given that there is currently no anchor in Toronto (although the new Ubisoft development centre in Toronto will change this). In addition to the immediate GTA, there are significant firms in St. Catherines (Silicon Knights) and London (Digital Extremes). One benefit the GTA has is that the national headquarters of major console manufacturers are located (Sony, Nintendo and Microsoft). Waterloo, of course, has RIM located close by, who is just beginning to get into the game market (with its first Game Developer Days at the Game Developers Conference in March 2010). We can also expect to see more growth in Ontario, due to the fairly recent improvements in tax credits and grants made available (now ranking Ontario higher than BC or Quebec, according to developers).  
  
One report highlights a few key elements to help grow the industry:

- "Investments in infrastructure & R&D: The digital game industry places a premium on technological innovation, but the cost of technological innovation can be prohibitive. Developing companies lack the scale to invest in infrastructure and the resources to invest in research and development."

- "Talent incubation: A broad range of universities and colleges providing training in game programming and design is often found within regional hubs and regional contenders, creating a talent and technology pipeline between local schools and companies that enhances the relationship between the academic community and regional digital game industry. This can be further facilitated by establishing incubation facilities on university campuses... In addition, several regions have established large scale research and education centres which create direct linkages between students and future employers."

In light of these documents, we can expect support and encouragement from the Province, the Federal government, as well as local industry. The Ontario 2012 report makes a specific recommendation to the Ontario government to establish academic-industry committees and mentioned the University of Waterloo as a leader that could help to grow the industry. They suggested that, "Academic institutions should take the lead on reaching out to industry to ensure that they are tightly linked and highly responsive to future needs around talent," and that "Other elements to be addressed by these committees would be the identification and completion of necessary gaming research (i.e. academic institutions could partner with industry to accomplish new initiatives) and the development of programs.

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for ongoing developer training. All activities would ultimately focus on keeping capabilities in Ontario and developing sources of competitive advantage with regards to talent.\textsuperscript{5}

In addition to video games, gambling games (especially slot machines) represent a large income generator for the province. OLG generates about $3.7 billion annually in Ontario. The University of Waterloo already has a gambling research group who have been working on research into the properties of slot machines that give rise to addiction. It is our hope that the Institute can become a place to research and disseminate information on slot machines, and to become a leader in public policy making when it comes to slot machines. Moreover, there is considerable cross-over between the slots and video game industry, and many of the same techniques for gambling research developed by the research group could be applied to video games.

The areas of serious games, educational games and simulations is, we predict, a particularly strong growth area for Canada's digital media economy. Game technologies can be used for many educational and training purposes and there is much room to grow in this area.

1.2 Importance and Benefits

Game-related research centres exist primarily in Scandinavia [e.g. Centre for Computer Games Research Copenhagen (@ IT University of Copenhagen), and the Interactive Institute (Sweden)], although a few have very recently been created in the United States [Game Research and Immersive Design Lab (GRID @ Ohio University), Games For Learning Institute (consortium of US universities funded by Microsoft Research), NC State Digital Games Research Centre, NYU Game Centre, USC Games Institute]. The majority of these American centres focus on games for learning and/or serious games and virtual reality.

There are also a number of centres worldwide that focus on gambling-related research [e.g. Center for Gaming Research (gambling: UNLV)], although these tend to focus on addiction and social issues rather than the actual games.

There are, to our knowledge, no formalized, dedicated games research centres in Canada. There are labs and hubs of activity in Vancouver (notably at GNWC and SIAT), Montreal (Concordia and as a part of the larger digital initiative Hexagram), York University, Algoma University, University of Alberta and University of Calgary, and smaller groups of faculty working on game-related research at most Canadian institutions. There is, therefore, room for—and a need for—a formalized Canadian group of researchers interested in games. The closest to our vision is the forthcoming (2011) "Eight: The Hamilton Institute for Interactive Digital Media," which bills itself not as a research centre, but as an institute that is developed with the City of Hamilton, Mohawk College, Silicon Knights and the Art Gallery of Hamilton, along with McMaster University. They list only four faculty members initially involved, all from the Computing and Software department. Our vision is much broader than this, and while we intend on including industry, we envisage a more international collaborative and cross-faculty effort.

We have outlined above why Waterloo is situated well geographically, but the University of Waterloo is also uniquely situated in other ways. For instance, UW has a world-wide reputation as a leader in computer science and engineering, it has established ties with some of the key industry players in the console and mobile space (e.g. Microsoft, Google, RIM), and has the talent and expertise to lead in

\textsuperscript{5} 'Ontario 2012: Stimulating Growth in Ontario’s Digital Game Industry’ August 2008
http://www.omdc.on.ca/AssetFactory.aspx?did=6290
games research. Waterloo also has a large Arts faculty that can collaborate on projects. With the interdisciplinary nature of games, it is essential that projects develop from cross-faculty collaborations.

Games offer many areas for research, and due to the recent academic interest in games and the rapid rise of the industry, there is considerable space for both academic theoretical research as well as more technical R&D and commercialization. Moreover, games now have technical problems which, if solved, can be applied to other sectors. For instance, distributed mobile gaming requires solutions of synchronization of streamed media files, compression technologies, security and networking, as well as more 'global' issues of IP and copyright, in addition to theoretical questions relating to privacy, collaboration, and social networking.

We believe that a Games Institute will offer interesting research problems, opportunities for academic and industry collaboration, potential for significant funding, opportunities for student learning, research and co-operative education, as well as social and economic benefits to the community and to Canada as a whole.

1.3 Mission

Our mission is to advance research and knowledge in game-related interactions and technologies. By doing so, we aim to establish strong academic and academic-industry research projects and programs, establish a richly cross-disciplinary graduate teaching and research institution, develop commercialization projects with industry partners, strengthen community ties, encourage student engagement, and enhance educational and employment opportunities for students.
2.0 Scope of Activities and Benchmarking

Our scope of activities is broad, encompassing:

1. **Research**: As noted above, there are many opportunities for research and development within the scope of games. Moreover, these are often cross-disciplinary problems that require collaboration across faculties. Under the umbrella of the Institute, theoretical as well as practical project-based research will be produced, including journal articles, papers, monographs, books, conference papers, and so on. We will collect and share these papers (where copyright permits) on our Institute’s website as a clear measure of progress and success. Benchmarking can be determined by the number and quality of these papers (citations, ranking, awards, etc.).

2. **Funding**: Tied in with Research Activities, we aim to obtain funding for infrastructure and research. There are industry and government grants available to projects such as we envisage. Our success in this area is quantifiable in dollars and number of awards.

3. **Commercialization projects, consulting and problem-solving for industry**: We anticipate the creation of new IP, as well as developing expertise in areas that will be of benefit to industry. Our success here is measurable in patent activity, royalties paid, new product creation, and consulting contracts.

4. **Outreach**: We will participate in outreach activities, including workshops and guest speaking, public policy recommendations. We will host guest speakers, as well as speak publically ourselves, along with periodically offering workshops. In addition, it is anticipated that in particular the Problem Gambling Research Group will continue to advise on legal cases and to create public policy recommendations. We will also quantify our media appearances and mentions.

5. **Education**: Education will take place in a variety of forms, most obviously in the form of training of HQPs on research projects. We also set as a long-term future goal the establishment of a cross-faculty degree at the graduate level that will enable students from different disciplines to come together on collaborative projects. Our outreach projects listed above will help to train and disseminate information not only to students, but also to industry, government, and the public at large. Waterloo students are already engaged in game production as part of UW’s game developer club and in courses such as the upper-level Digital Arts Communication courses. We wish to enhance cross-faculty ties to offer co-supervision of projects at the graduate level in particular, but also to involve students at all levels (including post-doctoral fellows) in research projects as part of our training of HQPs.

2.1 Cross-Faculty Research Projects

As a way of encouraging large-scale cross-faculty research, we will periodically propose one or more large research projects that require expertise from a number of different disciplines. Members will not have to work on these projects, but may elect to work on one or more projects if they see opportunities to share their expertise and collaborate with others.

The first projects we are proposing to explore as a group is as follows (and are intentionally vague and broad at this stage):
1. **Collaborative/Distributed gaming with new technologies**—we will explore ideas for distributing games across a network of mobile phones, on their own and in conjunction with other technologies, such as smart tables, iPads, and augmented reality technology, and Christie Digital's micro-tiles. This might include, for instance, distributed mobile phone games that require geographic position and more specific co-ordinates (using cameras and markers in an enclosed space, for instance). We also envisage using a collaborative display of micro-tiles in the 'fishbowl' of the Davis Centre, that students may interact and play games with by using their mobile phones as controllers.

2. **3D Gaming** - here we examine the various roles 3D technology will and might have in the design and play of various types of games. Issues include: determining guidelines for designing for 3D; envisioning and implementing new play experiences with 3D, researching and establishing new gaming paradigms based on 3D, effects of 3D on visual, audio, and tactile experiences, developing transmedia game-based artefacts using 3D.

3. **Educational Simulation Gaming** - working with partners in field such as medicine, psychology, business, education, and the military, we will explore the roles and methods for training through simulation games.

4. **Immersiveness across platforms**: We will explore how interface and interaction devices impact the game playing experience across platforms. We have a SSHRC SRG underway on this project.

The technologies afford new ways of interacting with each other, and offers unique opportunities for the development of health-based or educational-based games or public art, but also has many technical problems that need exploring, such as Wi-Fi/Bluetooth multicast streaming delays, mesh networking and security issues, and so on.
3.0 Objectives: Goals and Opportunities

We will work on our short-term goals within the first 3 years. The long term goals will become our focus starting in year 4.

3.1 Short Term Goals:

- Identify potential funding partners and obtain infrastructure and research funding
- Set up cross-faculty projects in which students and faculty could work together on game-related projects
- Increase offerings of game-related courses on campus
- Host a workshop
- Establish lab space for short-term and ongoing projects

3.2 Long Term Goals:

- Set up cross-faculty degree program at graduate level
- Establish a “neutral ground” research and teaching space in which we can work collaboratively
- Host a regular conference
- Host an interactive game-related art exhibition on campus (for instance, using game hardware or software as interface for art/sound)
- Obtain funding for research fellows, Post-doctoral fellows, and/or an annual "artist in residence"
- Create a larger network of associated researchers from outside the university
- Commercialize technologies developed
- Set up regular industry partners for co-op jobs
4.0 Affiliations

We recognize that some existing labs and centres/institutes on campus could be affiliated with and also share in resources of a Games Institute. We see the Institute as having a symbiotic relationship with existing centres such as the Institute for Computer Research, the Canadian Centre of Arts and Technology, and the proposed Stratford Institute. We anticipate that new technologies and ideas that develop from these other centres that have applications to games could be developed in parallel. For instance, if graduate students at Stratford Institute become involved in a new hardware technology relating to 3D projection, they may share that idea and explore the potentials of that technology in the game realm by becoming members of the GRI. Likewise, if someone working from under the hub of the Games Institute on gambling research develops new methods of exploring psychophysical response to slot machines, these methods may prove useful to areas of computer science that are not related to games.

There are many areas where technologies not designed originally for games are developed and incorporated into games (for instance, accelerometers) and games technology becomes incorporated into non-gaming practice (virtual reality health projects, simulations for sports training or education, for instance). Therefore, we see significant benefits of encouraging a dialogue between game-related work and other on-campus work. In particular, we see affinities with the following existing labs that could become affiliated with or produce research relevant to GRI (this list is not exhaustive):

- Gambling research group
- Computer graphics lab
- Virtual reality lab
- HCI (Human-Computer Interactions) and Collaborated Systems Lab in Systems Design
- CRIME lab (Critical Media Lab)
- Coding and Signal Transmissions lab
- Generative Software Development lab
- RELIVE (Research Lab for Immersive Virtual Environments)
- Advanced Interface Design Lab
- Tetherless Computing
- Logic Programming and AI Group
- Distributed System Research Group
- Canadian Centre of Arts and Technology
- Stratford Institute
- Institute for Computer Research

4.1 Fit with UW's Strategic Research Plan

In addition to the synergy with the Provincial and Federal Governments' funding areas of communication, digital media, and information technologies, we also see a strong fit with the aims of the University of Waterloo. The creation of a Games Institute fits into two of UW's Major Thrust Areas in the University's Strategic Research Plan; Information Technology and Innovation, Society and Culture. The Institute aims to both produce technological innovation, as well as understand social ramifications of technologies related to gaming. The inter-disciplinary, cross-faculty nature of the Institute, along with our aims for developing research, fits directly with the University's goals to:
- "emphasize basic and applied research in all disciplines, and facilitate the synergy between basic research and the application of knowledge";
- "stimulate high impact multi- and inter-disciplinary research on societal problems by increasing collaborations between researchers in science, mathematics and engineering and their counterparts in the humanities and social sciences, the health sciences and the environmental sciences";
- "commit energy and resources to becoming noted for research in "knowledge exchange", connecting and communicating with people technologically, cognitively and comprehensively";
- "attract increasing numbers of high quality graduate students and postdoctoral fellows into research that is deep, broad and challenging";
- "develop a passion for research among undergraduate students at an early stage by involvement in research activities through seminar courses, research assistantships and other research interactions"; and
- "ensure timely and effective dissemination and application of research through presentation and publication of results and, when appropriate, commercialization, and enhance and encourage the entrepreneurial spirit in students and faculty."

4.2 Affiliations Off-Campus

In addition to the on-campus affiliations described above, we anticipate growing off-campus affiliations, locally (Southern Ontario), nationally and internationally. With regards to academic affiliations, we propose an immediate formal collaboration with members from UOIT (University of Ontario Institute of Technology), Queen's University, University of Saskatchewan and University of Shizuoka (Japan) where our core faculty are already engaged in formal research partnerships. We also anticipate working with the GRAND NCE initiative to develop games-related research as part of their network.

It is also our aim to develop formal partnerships with non-academic partners. Initially, we hope to align ourselves with the proposed Canadian Centre for the Commercialization of Digital Game Technology that is developing out of London, Ontario (an industry-led initiative that is being proposed as a Centre of Excellence). This initiative is focused on the commercialization of game technology, which will provide an efficient pipeline to test and implement any technologies developed at UW relating to games with local industry partners. The proposed Centre is not focused on student training, experimental research, related areas of games (e.g. slot machines), theoretical or social impact studies, nor on other more "academic" pursuits with regards to games, and thus will not conflict with our proposed Institute.

Games research and implementation is worldwide, and our institute plans to develop, beginning immediately, a significant set of collaborations with research organizations and corporations in the United States, Europe, and, in particular, Asia. A particular part of the mandate of the first year of operations is to identity collaboration and funding opportunities in these international settings, with the purpose of developing research exchanges, partnerships, and large-scale collaborative grants.
5.0 Constitution

5.1 Management

The Director: The Institute will be led by a Director, reporting to the Vice-President, University Research. The Director will be appointed by the Vice-President, Academic & Provost (hereafter Provost) on the recommendation of the Vice-President, University Research (hereafter VPUR) for a term of up to four years, normally renewable once. Only a University of Waterloo faculty member may be appointed Director. The Director will be responsible for the overall management of the Institute, the preparation of its annual budget, supervision of Institute employees, and for guiding the research agenda of the Institute, with input from its membership. The VPUR, or designate, will annually review the performance of the Director, and will consult the Executive Council and the Board on reappointment of the Director, recommending such reappointment to the Provost. The Provost may remove the Director prior to his/her end of term via the mutual consent of the Provost, the VPUR, the Executive Committee, the Board, and the Director, or, in exceptional cases, on the recommendation of the VPUR, the Executive Committee, and the Board (within the parameters of academic freedom outlined in UW Policy 33). It is proposed that the Institute’s first Director be Dr. Neil Randall, English Language and Literature, Faculty of Arts. It is proposed that Dr. Randall’s term be for a period of four years.

The Associate Director: The Associate Director will report to the Vice-President, University Research, and will be appointed by the VPUR and Provost, on the recommendation of the Executive Council and the Board, for a term up to three years, normally renewable once. Only a faculty member at the University of Waterloo may be appointed Associate Director, except in exceptional cases in which the most suitable candidate is a faculty member at a similarly research-intensive university. The VPUR and Provost may remove the Associate Director prior to his/her end of term via the mutual consent of the Provost, the VPUR, the Executive Committee, the Board, and the Associate Director, or, in exceptional cases, on the recommendation of the VPUR, the Executive Committee, and the Board (within the parameters of academic freedom outlined in UW Policy 33). The Associate Director will be particularly focused on directing the research activities of the Institute, including grants, research workshops, publications, seminars, and public talks. It is expected that the Director and Associate Director will, except under exceptional circumstances, be from different faculties. It is proposed that the Institute’s first Associate Director be Dr. Stacey Scott, Systems Design Engineering, Faculty of Engineering.

The Executive Council will consist of the Director, the Associate Director, and five other Core Members appointed by the VPUW and spread as evenly as possible from among the faculties represented by the Core member list. The Executive Council will make recommendations to the director on the planning of the annual budget, research directions, fundraising and outreach activities. The committee will meet once per year or as needed.

The Board will consist of one of the Deans (for the first years, the Dean of Arts), the Director, the Associate Director, and two members of the Executive Council to be elected biennially by the Executive Council. The first members will be Karen Collins (as Chair) and Kevin Harrigan. The board will be advisory in role, providing general advice on financial management and objectives.

Core Members: UW faculty members and post-doctoral fellows (regular, adjunct or research faculty) who engage in game-related research or teaching may apply to become members at any time with a CV and a short statement regarding goals and reasons for joining. Their membership may be accepted or declined by the Executive Committee within 30 days of application and will last for as long as the
member wishes to remain a member, or until membership revocation via 5.2 below. Gaming need not be the only focus of any faculty member’s research in order for that faculty member to take part.

**Student Members:** UW graduate students who engage in game-related study, research or co-op work may apply for membership with a resume and a short statement regarding goals and reasons for joining. Their membership may be accepted or declined by the directors within 30 days of application and will be annually reviewed.

**Industry Members:** Industry members from government, NGOs and the private sector interested in the Institute’s research may participate by working with the Institute, attending workshops and conferences, and may be invited to meetings. Membership will be voted on by the Executive Council within 30 days of application and granted for one year (renewable).

**Affiliate Members:** Affiliate members (outside UW) may participate by working with the Institute’s research projects, attending workshops and conferences, and participate in meetings. Membership will be voted on by the Executive Council within 30 days of application and granted for one year (renewable). The cost per year for affiliate membership will be $10 per student, $50 for faculty, and $500 for organizations, with the exception of any members who are collaborators or partners on grants with Core members, who will then have free membership.

**5.2 Responsibilities and Privileges of Membership**

Members will benefit from membership in terms of access to the Institute’s facilities and equipment, access to any shared funding opportunities and research collaborations, participation in seminars, public lectures, workshops and conferences held by or supported by the Institute, and participation in the governance of the Institute.

Members are expected to contribute to the Institute through discussions, activities and/or research. Such contributions may mean, for instance, collaborating on research projects, publication of research, teaching at or attending a workshop or conference, attending public lectures, and/or sitting on committees. Members who have not participated in any such activities for a full calendar year and who cannot demonstrate reasonable attempts to do so will be subject to suspension or revocation of membership by the Executive Committee on consultation with the Vice-President, Academic & Provost.

Members’ ethical behaviour and academic freedom will be governed by University of Waterloo Policy 33. In cases of misconduct, the Executive Council may recommend to the the Vice-President, Academic & Provost, within the parameters of Policy 33, the suspension or revoking of a membership.

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5.3 Initial Executive Council Members

Neil Randall (Arts)
Stacey Scott (Engineering)
Karen Collins (Arts)
Gray Graffam (Arts)
Kevin Harrigan (Arts)

5.4 Initial Core Members (faculty and post-doctoral fellows) listed
Alphabetically (see faculty bios in Appendix)

1. Catherine Burns (Sys Des) (c4burns@uwaterloo.ca)
2. Rob Burns (Kinesthesiology) (rwburns70@sympatico.ca)
3. Karen Collins (DAC) (collinsk@)
4. Brian Cullen (PDF, Arts)
5. Chrysanne DiMarco (Computer Science) (cdimarro@)
6. Mike Dixon (Psych) (mjdxion@)
7. Colin Ellard (Psych)
8. Jonathan Fugelsang (Psych) (jfugels@)
9. Gray Graffam (Anth) (gggraaffam@)
10. Mark Hancock (Man. Sci) (mark.hancock@)
11. Kevin Harrigan (DAC) (KevinH@)
12. Andy Houston (Drama) (houston@)
13. Fue-Sang Lien (Mechanical and Mechatronics Engineering) (fslien@)
14. Vance MacLaren (PDF, Arts)
15. Hannah Martson (PDF, CS)
16. Aimee Morrison (English) (ahm@)
17. Marcel O’Gorman (English) (marcel@)
18. Neil Randall (rrandall@)
19. Stacey Scott (ENG: Sys Des) (s9scott@)
20. Scott Spidell (Drama) (sspidell@)
21. Peter Taillon (PDF, Arts)
22. Michael Terry (CS: HCI) (mterry@)

Initial Student Members

Michael Hancock (English)
Jason Hawreliak (English)
Alex Hodge (CCAT)
Michelle Jarick (Psychology)
Candice Jensen (Psychology)
Jennifer Aquino (Psychology)
5.3 Changes to the Constitution

Any Core Member may propose changes to the constitution at any time. Changes will require the supportive vote of the majority of the Executive Council (50 percent + 1) and are subject to the approval of the University of Waterloo's Senate Graduate and Research Council.
6.0 Facilities

6.1 Existing Space/Facilities
No current available on-campus space exists in which this work can be carried out on a collaborative basis. With the absence of a shared space, this will be a high priority for the Institute in the first few years. Initially, the space used will be from existing research space (e.g. CCAT lab, Gambling research lab, CRIME lab).

6.2 Required Space/Facilities
We envisage a growing requirement for facilities as the Institute expands its research and outreach activities. We have the ability to start small in existing space, but the collaborative nature of the research along with the nature of the equipment means that ideally we need a shared space on or near campus where faculty can work together along with students. This would include, for instance, a space large enough to encompass a motion capture system, new equipment such as smart tables, a testing lab, offices, and a shared collaborative design space. We plan on seeking external funding (from industry partners and government sources) to develop such a space on UW's campus. We envisage a space that would contain something like the following:
7.0 Budget

The budget for the Institute's activities will incorporate funding from within the institution, project-specific grants (international as well as federal and provincial), and development monies ('industry partners' income below includes donations and consulting). Funding will also be sought from partners through the Development Office. In particular, we are proposing that during the initial five years after the inception of the Institute, that any projects related to the Institute (that is, any projects created or proposed by members of the Institute) that obtain funding that includes overhead, be allowed to allot that overhead to the Institute directly. In this way, we will obtain the start-up funding that we require for the Institute's activities without imposing on University funds. With that proposal in mind, we predict a minimum five year budget as follows:

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Expenses Summary:

Admin & Tech support 35%: Administration expenses include general office supplies, hiring a work-study or co-op student at least one term a year to assist in paperwork and general office duties, etc. A professional half-time assistant will be hired to assist in general management, maintenance of equipment, private partner liaison and general staff support.

Outreach and Promotion 15%: Outreach includes funding towards seminars, workshops, exhibits, and funding for members towards conference or guest speaking travel (including bringing in guest speakers). Promotion includes web development and online presence, press releases for research projects, fundraising, as well as general marketing material (logo design, etc.). This work will be done by a work-study or co-op student.

Facilities 50%: Facilities and equipment will be our highest priority in the early years of the Institute. Note that after 5 years, it is assumed that enough money will be allocated for space and equipment that income can be rolled towards hiring of research fellows, as well as more administration and outreach activities.
8.0 Statements of Sanction and Commitment

Library and other UW Service Departments: We do not anticipate requirements beyond our faculty or departmental allotment.

IST Support Requirements: Until we have a dedicated space, we do not anticipate any new IST support requirements.

Department Chair/School Director and Dean: (Approval and support for the establishment of a centre/institute must be provided and signed by relevant Chairs/Directors and Faculty Deans. Any commitments or agreements to provide space, teaching relief or other resources, including overhead from contract research, should be documented and signed by those authorized to make such commitments.)

Dean: Arts Ken Coates
9.0 Appendix: Biographies of Core Faculty Members (alphabetical)


Rob Burns, Head athletic therapist, department of Athletics and Recreational Services. Rob is Adjunct lecturer for Kinesiology, and comprehensive examiner for athletic therapy program. He is certified in a number of athletic and health areas, including Certified Athletic Therapist CAT(C), Certified Strength and Conditioning Specialist (CSCS), Certified Kinesiologist, CK. He received his Master of Science California University of Pennsylvania. In 2004, he received a UW LIF award for “Sports Injuries Practical Lab Enhancement” and is interested in developing educational games to teach kinesiology.

Karen Collins: Canada Research Chair in Interactive Audio, Drama. Karen teaches in the Digital Arts Communication Program housed in Drama. She is also adjunct graduate faculty in Computer Science at the University of Ontario Institute of Technology. Since her PhD in 2002, her research has addressed issues of interacting with sound, particularly as applied to new media such as video games. This began with a historical examination of interactive sound, with a focus on the technological changes and impact that the technology had on the creative process. This culminated in two books: one anthology published by Ashgate in 2008 and a monograph published by The MIT Press in 2008. This latter book, Game Sound, received academic and industry acclaim, with an international award, and was voted in the “Top 10 Big Ideas in Gaming” at the Game Developers’ Conference in 2009, a conference attended by over 20,000 professionals. Since her time as Canada Research Chair in Interactive Audio (Tier II), she has been involved in a number of empirical and scientific experiments and technical work relating to interactive sound and games. This includes a patent-pending way of visually representing sound effects in games for the hearing impaired, standards work on an interactive audio file format (soon to be released by the Interactive Audio Special Interest Group), measurement of psychophysiological response to sound in slot machines and video games (resulting in a number of top journal papers, such as in Addiction), and distributed classification games to collect affective audio data (resulting in an Audio Engineering Society paper). In addition, her CRC project, relating to affective algorithmically generated interactive audio is ongoing, with a number of papers in top journals and conferences.

Michael J. Dixon, Professor, Psychology. Mike Dixon is a Full Professor of Psychology at the University of Waterloo. He completed his PhD in 1990 at Concordia University, and did postdoctoral research at the Montreal Neurological Institute, prior to becoming an Assistant Professor of Psychiatry at McGill University in 1995. He moved to the University of Waterloo in 1997 and received tenure from this University in 2001. He was promoted to full professor in 2006. He has served as the Chair of the
Department of Psychology at the University of Waterloo from 2005 to 2007. Dixon has been continuously funded by NSERC grants since 1997 and has also received grants from the Heart and Stroke foundation of Canada the Alzheimer’s Society of Canada, and the Ontario Problem Gambling Research Centre. Over his career he has garnered more than 1 million in grant funding as a principal investigator. He has published over 70 peer-reviewed articles in Journals such as Nature, Journal of Cognitive Neuroscience, Cognitive Neuropsychology, Cognitive Affective and Behavioural Neuroscience, NeuroReport, NeuroCase, Brain and Cognition, and Cortex. His research has garnered a number of awards including the Premier's Research Excellence Award (2001-2006), and the Chercheur Boursier Fonds de la Recherche en Santé du Québec (1997-2001), and the Nelson Butters Award (1995) for the best postdoctoral submission at the International Neuropsychological Society. He and his colleagues at Waterloo are internationally known for their research on synaesthesia, with their research numbered among the Top Discoveries at the University of Waterloo. Recently he has begun to research the psychological and psychophysical responses of gamblers slot machines. Since being at Waterloo he has twice won an Outstanding Performance Award (2005, 2008), a distinction designed to recognize the top 10% of faculty members at the University.

Gray Graffam: Assistant Professor, Anthropology. Gray studied Anthropology at Brown University and the University of Toronto. His current research is focused on contemporary ethnography and its role in understanding technological innovation and its impact on society. This chiefly falls into two areas: the anthropology of digital media (e.g. gaming, texting, and visual messaging), and the anthropology of farming communities. Overall, his research focuses on the role of the individual in the anthropology of "self" and the definition of group identities. Theoretically, his research embraces post-modernism and post-humanism. Dr. Graffam is currently studying the impact of virtual worlds and online gaming on modern society. He is particularly drawn to understanding the role of virtual interaction in the formation of identity and group culture. He has recently presented research on the importance of fictive imagination in the study of online cultures. Dr. Graffam is also continuing his research on design anthropology (market ethnography) and is working on a paper that deals with the anthropology of market research, particularly as it impacts game design and the creation of virtual worlds. Dr. Graffam is also continuing his research on the farming community of Buxton, Ontario from the standpoint of entrepreneurial innovation and cultural adaptation. He is working on an article that examines four generations of black farmers in rural Ontario.

Mark Hancock, Assistant Professor, Department of Management Sciences: I am an assistant professor at the University of Waterloo in the Department of Management Sciences in the Faculty of Engineering. I graduated with a Ph.D. from the University of Calgary and the department of Computer Science. I completed my Ph.D. under the supervision of Dr. Sheelagh Carpendale and was a member of InnoVis in the Interactions Lab. Some of his recent publications include: Supporting sandtray therapy on an interactive tabletop. Mark Hancock, Thomas ten Cate, Sheelagh Carpendale, and Tobias Isenberg. In Proc. CHI, pp. 2133-2142, 2010. Shallow-depth 3D interaction: Design and evaluation of one-, two- and three-touch techniques. Mark Hancock, Sheelagh Carpendale, and Andy Cockburn. In Proc. CHI 2007, pp. 1147-1156, 2007. (Nominated for Best Paper Award) and Informing the design of direct-touch tabletops. Chia Shen, Kathy Ryall, Clifton Forlines, Alan Esenther and Frederic D. Vernier, Katherine Everitt, Mike Wu, Daniel Wigdor, Meredith Ringel Morris, Mark Hancock, and Edward Tse. IEEE Computer Graphics and Applications, 26(5):36-46, 2006.
Kevin Harrigan, Research Associate Professor, Digital Arts Communication: Kevin Harrigan is a member of the University of Waterloo’s Canadian Centre for Arts and Technology (CCAT) and the Digital Arts Communication (DAC) program where he teaches computer game design. Dr. Harrigan is the lead researcher and contact person for the Problem Gambling Research Team at the University of Waterloo (http://problemgambling.uwaterloo.ca/). His primary research interest is in gambling addictions with a focus on why so many slot machine gamblers become addicted. In Ontario, 60% of slot machine revenue is derived from problem gamblers. Kevin’s area of expertise is computer science and math/statistics as it relates to the design and implementation of slot machine games. Research topics of interest include: PAR Sheets, near misses, computer algorithms used to misrepresentation slot machine game outcomes, limitations of random number generators (RNGs), gaming regulations, and self-exclusion policies. He has been a technical Expert Witness in legal cases regarding the programming of Electronic Gaming Machines (EGMs) including slot machines, video slots, and video poker. Over the past three years Kevin and his team have been successful in acquiring over $1.5 million in problem gambling research funding. His recent publications include:

Andrew Houston, Associate Professor, Drama. Andrew is involved in site-specific theatre, and is currently undertaking a performance project related to problem gambling. He has recently been involved in a number of artistic works, including: Edna’s Archive: Learning to Perform Memory/ Learning to Perform Forgetting (A multi-media, site-specific performance based on the found materials of Edna Bear. Produced by CAFKA, MT Space, and Pat the Dog for the IMPACT 09 Festival, Kitchener, Ontario, Sept. 2009). See http://www.ednasarchive.ca/, Windblown / Rafales (a multi-media, site-specific performance examining the idea of faith, from a secular point of view, as part of this francophone community’s centennial celebration. The performance took place throughout the town.) Produced by Knowhere Productions, Ponteix, Saskatchewan (July 2008). See http://www.knowhereproductions.ca/.

Fue-Sang Lien, Professor, Mechanical and Mechatronics Engineering. Dr. Lien has more than 20 years of research experience in the development of Computational Fluid Dynamics (CFD) algorithm and modeling turbulent flows of industrial relevance. He obtained his PhD at University of Manchester Institute of Science and Technology (UMIST) in the UK in the period of 1988-1992 researching into development of an all-speed code STREAM,
incorporating several RANS models with up to second-moment closure. Between 1992 and 1995, he worked as postdoctoral researcher and project officer, participating actively in a wide range of projects supported by British Aerospace, Rolls Royce Aeroengines, Defence Research Agency in the UK and European Commission. In 1996, he became Lecturer at UMIST. In 1997, he joined the University of Waterloo as Assistant Professor, and was promoted to Associate Professor with tenure in 2001 and become Professor in 2006. Dr. Lien has a broad range of research interests, including urban flow simulation using RANS/LES pertinent to Chemical, Biological, Radiological or Nuclear (CBRN) warfare supported by Department of National Defence, free-surface flow, fluid-structure interaction, aeroacoustics, detonation, turbulent non-premixed combustion, wind energy, CO2 geological storage, chemical vapor deposition, turbomachinery flow, parallel computing, injection moulding, optimization using genetic algorithm. Dr. Lien has published more than 140 journal and conference papers on numerical techniques, turbulence modeling and validation.

Aimée Morrison: Assistant Professor of Rhetoric, English. Aimée teaches social media theory and practice, digital design, history and theory of media, and dystopian writing. She has published on video game movies of the 1980s, computers in romantic comedy film, the rhetoric of Internet manifestos, and blogging in literary studies. Her current research focuses on how ordinary people live their lives online, most recently using texts drawn from mommy blogging.


Neil Randall: Professor, English Language and Literature. Neil was a founding member of Waterloo’s Rhetoric and Professional Writing/Communication Design programs, conducts research in game studies, and has published numerous how-to computer books and many feature articles, columns, and reviews in computer magazines such as PC Magazine, Smart Computing, PC Computing, PC Gamer, etc. Neil has also been deeply involved in several new media initiatives at Waterloo, including the Master of Arts in Experimental Digital Media (XDM), a new program dedicated to exploring the creative and critical processes provided by the new digital media; the proposed Master’s program for University of Waterloo at Stratford, a new campus focused on the next generation of digital media applications and content models; and the Critical Media Lab, of which he is associate director and currently acting director. Aside from these academic pursuits, Neil has been heavily involved in both the video gaming and conventional board gaming communities for 25 years. He has published over 300 articles, reviews, and columns for leading game magazines and newspapers, and is well established as a professional designer and producer of complex historical simulation board games, including such titles as /Pax Romana: The Ancient Mediterranean World/ and forthcoming series /Russia: The Soviet-German War/. Over the last
year, he has been collaborating with Stacey Scott to explore the potential of combining these gaming genres to create a new brand of social computer games facilitated by emerging multi-touch tabletop computers.


**Scott Spidell, Drama.** Scott is the Head of Production and a faculty member in the Drama Department at University of Waterloo where he teaches the technical production courses and lighting design. Scott also managed The Canadian Centre of Arts and Technology for five years, where he was heavily involved with system design and integration. He has worked professionally in theatre, film, and television for over 25 years and is doing some preliminary research in mediated theatre.

**Michael Terry, Assistant Professor, Computer Science.** Michael Terry is an assistant professor in the David R. Cheriton School of Computer Science at the University of Waterloo, where he co-directs the Human-Computer Interaction (HCI) Lab (hci.uwaterloo.ca). His research focuses on developing, deploying, and evaluating new tools to support usability needs in free/open source software development. As part of this research, his group created ingimp (http://www.ingimp.org), an instrumented version of GIMP that provides the first rich, large-scale characterization of how an open source application is used "in the wild," on a day-to-day basis. His past research also includes the development of novel input and interaction techniques. As an example, his group created Maestro, a gesture-based electronic presentation that utilizes computer vision to control and interact with presentations. His group also created Kinematic Templates, a new type of drawing aid that improves users' drawing input, without losing the human element. He routinely teaches classes in human-computer interaction, including a fourth year class in which students study local professionals to develop and design new technology to meet their unique needs.