

University of Waterloo
SENATE
Notice of Meeting

Date: Monday, January 16, 2006

Time: 4:30 p.m.

Place: Needles Hall, Room 3001

	OPEN SESSION	Page	Action
4:30	<u>Consent Agenda</u> Motion: That items 1-5 [below] be approved or received for information, as indicated, by consent.		
	1. Approval of the November 21, 2005 Minutes [enclosed]		Decision
	2. Report of the Chair		
	a. Recognition and Commendation	2, A1-A2	Information
	3. Reports from the Faculties and Renison College	2, A3-A18	Information
	4. Report of the Executive Committee	2, A19	Information
	5. Other Business		
	a. Committee and Council Appointments	2, A20	Decision
	<u>Regular Agenda</u>		
	6. Presentations		
4:35	a. Academic Program Reviews	2, A21-A31	Information
4:50	b. Graduate Studies	2	Information
	7. Business Arising from the Minutes		
5:10	a. <i>Maclean's</i> Rankings	2	Discussion
5:30	b. Sixth Decade Plan	2	Discussion
6:00	8. Report of the Chair		
	a. Environmental Scan	2	Information
6:05	9. Report of the Vice-President, Academic & Provost	2	Information
	10. Reports from Committees and Councils		
6:10	a. Graduate & Research Council	2, A32	Decision/Information
6:15	b. Scholarships & Student Aid Committee	2, A33-A42	Information
6:20	c. Undergraduate Council	2, A43-A47	Decision/Information
6:25	11. Other Business		
	CONFIDENTIAL SESSION		
6:30	12. Approval of the November 21, 2005 Minutes [enclosed]		Decision
6:35	13. Report of the Honorary Degrees Committee	3, CS1-CS3	Decision
6:40	14. Other Business		
	a. Naming Proposal	3, CS4	Information/Discussion

The Executive Committee met on January 3, 2006 and wishes to report as follows:

2. REPORT OF THE CHAIR

- a. Recognition and Commendation.* The Committee agreed to forward this report to Senate for information.

3. REPORTS FROM THE FACULTIES AND RENISON COLLEGE

The Committee agreed to forward these reports to Senate for information.

4. REPORT OF THE EXECUTIVE COMMITTEE

The Committee agreed to forward this report to Senate for information.

5. OTHER BUSINESS

- a. Committee and Council Appointments.* The Committee agreed to recommend these appointments to Senate for approval.

6. PRESENTATIONS

- a. Academic Program Reviews.* The Associate Vice-President, Academic will present.
- b. Graduate Studies.* The Dean of Graduate Studies will present.

7. BUSINESS ARISING FROM THE MINUTES

- a. Maclean's Rankings.* Select parameters (quality of students and research intensity) will be discussed.
- b. Sixth Decade Plan.* Fulsome discussion was anticipated.

8. REPORT OF THE CHAIR

- a. Environmental Scan.* The President will report as appropriate.

9. REPORT OF THE VICE-PRESIDENT, ACADEMIC & PROVOST

The Vice-President will report as appropriate.

10. REPORTS FROM COMMITTEES AND COUNCILS

- a. Graduate & Research Council.* The Committee agreed to forward this report to Senate for approval and information as indicated.
- b. Scholarships & Student Aid Committee.* The Committee agreed to forward this report to Senate for information.
- c. Undergraduate Council.* The Committee agreed to forward this report to Senate for approval and information as indicated.

University of Waterloo

SENATE

January 16, 2006

Report of the Chair

For Information

1. RECOGNITION AND COMMENDATION

Faculty

The Scientific Director of the Institute for Quantitative Finance and Insurance, Professor **Phelim Boyle** (Accountancy), has been named the 2005 International Association of Financial Engineers (IAFE)/SunGard (a global leader in software and processing solutions for financial services) Financial Engineer of the Year. The Chairman of IAFE said: “Dr. Boyle has produced a remarkable number of contributions to the field of financial engineering, over a long career. By focusing on bridging theory and the real world, his work has brought clarity to the difficult process of actually implementing theoretical models in option pricing. His seminal papers applying Monte Carlo techniques and high-dimensional lattice methods to practical problems provide foundation for much of the work financial engineers perform. It is fitting that the IAFE and SunGard recognize his contributions and insight to our field by naming him the Financial Engineer of the Year.”

The latest volume, *Sustaining Our Futures: Reflections on Environment, Economy and Society*, in the Department of Geography’s publication series celebrates 35 years at UW for **Bruce Mitchell**, who is currently the Associate Provost, Academic & Student Affairs. The book has essays from 14 of Mitchell’s protégés, on topics that range from the management of water, floodplains and entire river basin systems through to resource conservation, local knowledge systems, protected area legislation, cumulative impact assessment and feminist environmental geographies. “That he is an outstanding teacher and educator is beyond refute,” say the editors of the book – Dan Shrubsole (now of the University of Western Ontario) and Nigel Watson (University of Lancaster, England), both former PhD students with Mitchell. “Yet Bruce’s contribution is much greater than these collective activities suggest. He has also played a pivotal role in mentoring his students, particularly his graduate students, and is considered an ally and friend to many.”

Professor **Bill Poole**, Director of the Centre for Cultural Management, has received the 2005 Association of Cultural Executives (ACE) Award for his outstanding contributions to cultural management in Canada.

Interim Dean of Environmental Studies, **Ellsworth LeDrew** (Geography), has been elected, through the Geoscience and Remote Sensing Society of the Institute of Electrical and Electronics Engineers (IEEE), a Fellow of IEEE with the citation “for contributions to environmental remote sensing sciences.”

Students

Two Pattern Analysis and Machine Intelligence (PAMI) PhD students won prizes at the second annual LORNET e-Learning Scientific Conference in Vancouver last month. **Khaled Hammouda** took first place for best demo, “Automatic Metadata Extraction,” showing text mining techniques to extract key information from documents, for the purpose of automatically annotating them with metadata (a key component in e-learning environments). **Masoud Makrehchi** took second place for best poster, “Unsupervised Keyword Extraction based on Corpora,” which also employs text mining

algorithms to extract keywords from a document collection. The students are both supervised by Mohamed Kamel, Director of PAMI.

A team of four fourth-year students – **Chris Deruyter**, **Carol Wong**, **Brent Sellors** and **Faisal Hadibhai** – took first place in the second annual University of Ottawa Accounting Competition this month. The competition is designed to challenge upper-year students as they get closer to their Chartered Accountant designation. A total of 11 teams from five universities took part, including the UW group, selected by lecturer Alastair Lawrence based on their academic achievements and success in UW’s WatCase competition.

After dominating a recent qualifying event, the Waterloo Black team, made up of **Tor Myklebust** (Combinatorics & Optimization), **David Pritchard** (Combinatorics & Optimization) and **Kartikaya (Kats) Gupta** (Software Engineering) and coached by Professor Gordon Cormack, is preparing for the 30th Association for Computing Machinery (ACM) International Collegiate Programming Contest World Finals. The competition, hosted by Baylor University and sponsored by IBM, will be held next spring at the Hilton Palacio del Rio in San Antonio. Waterloo has been world champion in the ACM programming competition twice and North American champion five times.

A graduate student in Electrical & Computer Engineering, **Mohammad Maymandi-Nejad**, is this year’s winner of an award from the Strategic Microelectronics Council. The award recognizes “industrial collaboration,” and Maymandi-Nejad was cited for his project entitled “A Wireless Bio-Implantable Device for Monitoring Blood Pressure of Transgenic Mice.”

Engineering student **Kirsten Robinson** took second place in the Design for the Cold Competition with a plan to cover sections of northern downtowns with innovative transparent materials. The entry, called the “Sudbury Street Skins Project,” imagines ecologically friendly solutions for downtown spaces in northern cities. It proposes covering streets with a transparent roof made of an ecologically friendly material called Texlon. Graduates of Architecture won third place in the competition: **Chris Hardwicke** proposed a covered bicycle highway that would run above the roads; and **Alexander Tedesco** proposed using geothermal heat to create warm public spaces.

Building

UW’s new **School of Architecture** building in Cambridge was awarded a 2005 Wood Works Award at a recent ceremony held at the Blue Mountain Resort in Collingwood. The award, in the Heritage category, reflects not only the preservation of the wood structure, columns and floor slabs, and maple flooring, but also the integration of wood throughout in doors, sills, shelving and casework, especially in the Musagetes Architecture Library. The Wood Works Awards program is sponsored by the federal and provincial governments, Canadian Wood Council and private sector companies in forest and wood products industries.

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF APPLIED HEALTH SCIENCES TO SENATE

Monday, January 16, 2005

For Information:

A. *APPOINTMENTS*****

Change in Appointments

Adjunct Appointment

HARVEY, Andrew, Lecturer, Kinesiology, September 1, 2005 to December 31, 2005.

Visiting Appointments

SELISKE, Patrick, Associate Professor, Health Studies and Gerontology, October 1, 2005 to September 30, 2006.

Adjunct Appointments

FISCHER, Darran, Lecturer, Kinesiology, January 1, 2006 to April 30, 2006.

FRANK, James, Professor, Kinesiology, January 1, 2006 to June 30, 2009.

KACZYNSKI, Andrew, Lecturer, Recreation and Leisure Studies, January 1, 2006 to April 30, 2006.

KRAMER, Dee, Assistant Professor, Kinesiology, October 1, 2005 to June 30, 2008.

MELDRUM, John, Lecturer, Recreation and Leisure Studies, January 1, 2006 to April 30, 2006.

RAWSON, Nigel, Professor, Health Studies and Gerontology, July 1, 2005 to June 30, 2007.

YUEN, Felice, Lecturer, Recreation and Leisure Studies, May 1, 2006 to August 31, 2006.

B. *ADMINISTRATIVE APPOINTMENTS*****

GILBERT, Adrienne, Associate Chair, Undergraduate Studies, Recreation and Leisure Studies, January 1, 2006 to June 30, 2008.



Roger C. Mannell, Dean
Applied Health Sciences

UNIVERSITY OF WATERLOO

REPORT OF THE DEAN OF THE FACULTY OF ARTS TO SENATE

JANUARY 16, 2006

For information:

A. **APPOINTMENTS**

New Probationary Term Appointments

GORMAN, Daniel, B.A., History, St. Francis Xavier University, 1996; M.A., History, Queen's University, 1997, Ph.D., History, McMaster University, 2003. Assistant Professor, Departments of History and Political Science, May 1, 2006 to June 30, 2009. Assistant Professor, Modern European History, Trent University, 2003-2004; Research Assistant, MCRI Globalization and Autonomy Project, Institute on Globalization and the Human Condition, McMaster University. SSHRC Post-Doctoral Fellow, Department of History, York University, 2004-2005; and the Munk Centre for International Studies, University of Toronto, 2002-2004. Author of *Imperial Citizenship: Empire and the Question of Who Belongs*, (Manchester: Manchester University Press, forthcoming 2006). Professor Gorman is a specialist in British and Imperial history and has already had his research on globalization and international governance collected for forthcoming anthologies. He adds important strength to UW's research capability and to the Department's graduate and undergraduate teaching.

STATIEV, Alex B.Sc., Electronics Degree, Moscow Mining Institute, Russia, 1978; M.A. History, University of Calgary, 1998; Ph.D., History, University of Calgary, 2004, Assistant Professor, Department of History, July 1, 2006 to June 30, 2009. Post-doctoral Fellow at John M. Olin Institute for Strategic Studies, Harvard University, 2005-2007; Sessional instructor at the University of Calgary, 2004-2005; SSHRC Post-doctoral Fellowship (transferred from University of Toronto to Harvard) 2005-2007. His research has already won international awards, including the Harry Frank Guggenheim Dissertation Fellowship, 2002-2003 and Soviet Cleansing Methods in the Western Borderlands: Their Goals, Targets and Effectiveness (1940-52)," *Journal of Strategic Studies*, July 2005. His work on post-Soviet era, counter terrorism, and insurgency/counter insurgency in Latin America, Asia, and Eastern Europe meets UW needs and fits well with the Center for International Governance Innovation. Very few Soviet specialists in Canada. His field will be very attractive to international and domestic graduate students.

Adjunct Appointments

AURINI, Janice, Lecturer, Department of Sociology, May 1, 2006 to August 31, 2006.

CHRISTIE, Ryerson, Lecturer, Department of Political Science, January 1, 2006 to April 30, 2006.

MAES, Nick, Assistant Professor, Department of Classical Studies, January 1, 2006 to April 30, 2006.

NARVESON, Jan, (Professor Emeritus), Professor, Department of Philosophy, September 1, 2005 to December 31, 2005

NARVESON, Jan (Professor Emeritus), Professor, Department of Political Science, January 1, 2006 to April 30, 2006.

PACI, Tim, Lecturer, Department of Drama and Speech Communication, January 1, 2006 to April 30, 2006.

RAMPURE, Archana, Assistant Professor, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

SAWCHUK, Dana, Assistant Professor, Department of Sociology, November 1, 2005 to October 31, 2008.

STOUTENBURG, Dennis, Assistant Professor, Jewish Studies, January 1, 2006 to April 30, 2006.

WYSE, Bruce, Assistant Professor, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

ZIAIAN, Shodja, Lecturer, Department of Political Science, January 1, 2006 to April 30, 2006.

Adjunct Reappointments

BEDUNEAU, Fabienne, Lecturer, Department of French Studies, January 1, 2006 to April 30, 2006.

COPP, Trevor, Lecturer, Department of Drama and Speech Communication, January 1, 2006 to April 30, 2006.

CORNING, Gail, Assistant Professor, Department of Drama and Speech Communication, January 1, 2006 to April 30, 2006.

DONOVAN, Anne-Marie, Lecturer, Department of Drama and Speech Communication, January 1, 2006 to April 30, 2006.

FARVOLDEN, Peter, Assistant Professor, Department of Psychology, September 1, 2005 to August 31, 2006.

FLERAS, Augie, Professor, Department of Sociology, January 1, 2006 to April 30, 2006.

GINGRICH, Nadine, Assistant Professor, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

HARTLING, Shannon, Assistant Professor, Department of Drama and Speech Communication, January 1, 2006 to April 30, 2006.

HARTLING, Shannon, Assistant Professor, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

HASTEDT, Slawomira, Lecturer, Department of Spanish and Latin American Studies, January 1, 2006 to April 30, 2006.

HILL, Heather, Lecturer, Department of Drama and Speech Communication, January 1, 2006 to April 30, 2006.

HUTTER, Daniel, Lecturer, Department of Classical Studies, January 1, 2006 to April 30, 2006.

KRELLER, Paul, Assistant Professor, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

KUNTZ, Elizabeth, Lecturer, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

MCARTHUR, Kathryn, Lecturer, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

MCARTHUR, Kathy, Lecturer, Department of Drama and Speech Communication, January 1, 2006 to April 30, 2006.

MICHAELI, Rudolf, Assistant Professor, Department of Germanic and Slavic Studies, January 1, 2006 to April 30, 2006.

OLIVER, Jill, Lecturer, Department of Philosophy, September 1, 2005 to December 31, 2005.

PENNY LIGHT, Tracy, Assistant Professor, Department of History, January 1, 2006 to April 30, 2006.

SAPP, Alan, Lecturer, Department of Drama and Speech Communication, January 1, 2006 to April 30, 2006.

SHARIFY-FUNK, Meena, Lecturer, Department of Religious Studies, January 1, 2006 to April 30, 2006.

SMYTH, Jacqui, Assistant Professor, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

TRUSCELLO, Michael, Lecturer, Department of English Language and Literature, January 1, 2006 to April 30, 2006.

UJIMOTO, Victor, Professor, Department of Sociology, January 1, 2006 to April 30, 2006.

VERA-QUINN, Regina, Lecturer, Department of Spanish and Latin American Studies, January 1, 2006 to April 30, 2006 and May 1, 2006 to August 31, 2006.

VOLYNSKA, Rimma, Assistant Professor, Department of Germanic and Slavic Studies, September 1, 2005 to August 31, 2006.

Cross Reappointment

ROWLANDS, Ian, Associate Professor, Department of Environment and Resource Studies, cross reappointment to Department of Political Science, January 1, 2006 to June 30, 2007.

Graduate Student appointed as Part-time Lecturer

DUNPHY, Tara, Department of Anthropology, May 1, 2006 to August 31, 2006.

B. RESIGNATION

GRAHAM, Phil, Associate Professor, Department of Drama and Speech Communication, resigning November 28, 2005 rather than December 15, 2005.

C. ADMINISTRATIVE APPOINTMENTS

BURT, Sandra, Associate Dean for Graduate Studies and Research, Faculty of Arts, January 1, 2006 to December 31, 2008.

GREEN, Art, Associate Chair, Undergraduate Studies, Department of Fine Arts, November 7, 2005 to June 30, 2006.

KENYON, Tim, Chair, Department of Philosophy, July 1, 2006 to June 30, 2009.

KIRTON, Doug, Associate Chair, Graduate Studies, Department of Fine Arts, January 1, 2006 to December 31, 2006.

KUMAR, Ramesh, Director of the International Trade Specialization, July 1, 2005 to June 30, 2006.

D. SABBATICALS

FAMA, Antonio, Associate Professor, Department of Spanish and Latin American Studies, July 1, 2006 to June 30, 2008, twelve months at 100% salary.

GRUBISIC, Vinko, Associate Professor, Department of Germanic and Slavic Studies, January 1, 2006 to June 30, 2006, six months at 100% salary.

HELLER, Daniel, Assistant Professor, Department of Psychology, September 1, 2006 to February 28, 2007, six months at 100% salary.

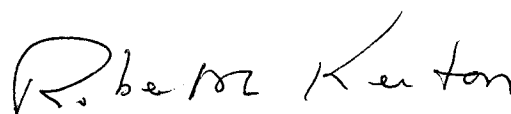
MACDOUGALL, Heather, Associate Professor, Department of History, January 1, 2006 to December 31, 2006, twelve months at 100% salary.

MICHELA, John, Associate Professor, Department of Psychology, July 1, 2006 to June 30, 2007, twelve months at 85% salary.

ROSS, Hildy, Professor, Department of Psychology, January 1, 2007 to December 31, 2007, twelve months at 85% salary.

ROSS, Michael, Professor, Department of Psychology, January 1, 2007 to June 30, 2007, six months at 100% salary.

ZANNA, Mark, Professor, Department of Psychology, January 1, 2007 to June 30, 2007, six months at 100% salary.



Robert R. Kerton
Dean, Faculty of Arts

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF ENGINEERING TO SENATE
January 16, 2006

For information:

A. APPOINTMENTS

Probationary Term Reappointment

BIRKETT, Stephen, Associate Professor, Department of Systems Design Engineering, July 1, 2006 – June 30, 2009. PhD University of Waterloo 1990; MSc University of Waterloo 1986; BSc University of London, England 1976.

Definite Term Reappointment -- full-time

SEMENOV, Oleg, Research Assistant Professor, Department of Electrical & Computer Engineering, November 1, 2005 – December 31, 2005

Visiting Appointments

CHEN, Wu Ming, Researcher, Department of Mechanical Engineering, October 15, 2005 – October 14, 2006.

ETUBUS, John, Scholar, Department of Chemical Engineering, November 1, 2005 – May 31, 2006.

FARAHAT, Said, Professor, Department of Mechanical Engineering, October 25, 2005 – October 24, 2006.

GUETTLER, Barbara, Scholar, Department of Chemical Engineering, October 1, 2005 – March 31, 2006.

IGBO, Michael A., Scholar, Department of Electrical & Computer Engineering, October 1, 2005 – March 31, 2006.

MORALEJO, Carol, Scholar, Department of Chemical Engineering, September 1, 2005 – August 31, 2007.

SAGHAFIAN, Bahram, Associate Professor, Department of Civil Engineering, December 1, 2005 – November 30, 2006.

SOOFIAN, Safiyeh, Scholar, Department of Chemical Engineering, March 1, 2007 – November 30, 2007.

XINCHENG, Tian, Scholar, Department of Mechanical Engineering, February 1, 2006 – January 31, 2007.

Visiting Reappointments

GUO, Qi, Scholar, Department of Electrical & Computer Engineering, October 1, 2005 – December 31, 2005.

Adjunct Appointments

BICKEL, Grant, Researcher, Department of Civil Engineering, October 1, 2005 – September 30, 2007.

BRUSCOLI, Beatrice, Associate Professor, School of Architecture, September 1, 2005 – December 31, 2005.

EL BADAWY, Ossama, Lecturer, Department of Systems Design Engineering, January 1, 2006 – April 30, 2006.

ELIAS BISWAS, Mohammad, Lecturer, Department of Chemical Engineering, January 1, 2006 – April 30, 2006.

ELMASRY, Mohamed, Professor, (Professor Emeritus), Department of Electrical & Computer Engineering, January 1, 2006 – December 31, 2008.

FOX, Steven, Assistant Professor, Department of Civil Engineering, January 1, 2006 – April 30, 2006.

GROVE, Jason, Lecturer, Department of Chemical Engineering, January 1, 2006 – August 31, 2006.

HULLS, Carol, Assistant Professor, Department of Electrical & Computer Engineering, January 1, 2006 – December 31, 2008.

NATHWANI, Jatin, Researcher, Department of Civil Engineering, October 1, 2005 – September 30, 2007.

WAGNER, R. Ben, Lecturer, Engineering Undergraduate Studies Office, January 1, 2006 – April 30, 2006.

WINTON, Tracey E., Assistant Professor, School of Architecture, September 1, 2005 – December 31, 2005.

Adjunct Reappointments

HUANG, Robert, Professor, (Professor Emeritus), Department of Chemical Engineering, August 1, 2004 – July 31, 2007.

KERR, Hugh, Professor, (Professor Emeritus), Department of Mechanical Engineering, January 1, 2004 – December 31, 2006.

Cross Appointments

MANN, Stephen, Associate Professor, School of Computer Science to Department of Mechanical Engineering, October 1, 2005 – September 30, 2008.

Staff Appointments to Faculty

STEFFLER, Jeremy, Lecturer, Engineering Undergraduate Studies Office, January 1, 2006 – December 31, 2006.

Changes in Appointments

FATHI, Alireza, Visiting Scholar, Department of Mechanical Engineering was June 1, 2005 – March 31, 2006 changed to July 1, 2005 – June 30, 2006.

WILSON, William, Administrative Appointment, Director of Software Engineering Program, Department of Computer Science should be Department of Electrical & Computer Engineering, July 1, 2005 – June 30, 2006.

B. RETIREMENTS

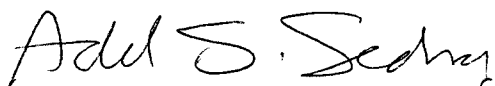
ELMASRY, Mohamed, Professor, Department of Electrical & Computer Engineering, January 1, 2006.

FOR APPROVAL BY THE BOARD OF GOVERNORS

C. SABBATICAL

GUILD, Paul, Professor, Department of Management Sciences, January 1, 2006 – December 31, 2006, twelve months at 100% salary.

WEST, Jeffrey, Assistant Professor, Department of Civil Engineering, January 1, 2006 – June 30, 2006, six months at 100% salary.



Adel S. Sedra
Dean, Faculty of Engineering

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF ENVIRONMENTAL STUDIES TO SENATE
January 16, 2006

For Information:

A. APPOINTMENTS

Adjunct Reappointments

HOERNIG, Heidi, Adjunct Lecturer, School of Planning, January 1, 2006 to April 30, 2006.

JACKSON, John, Adjunct Lecturer, Department of Environment and Resource Studies, January 1, 2006 to April 30, 2006.

LEAHY, Danielle, Adjunct Lecturer, School of Planning, January 1, 2006 to April 30, 2006.

WATTY, Frank, Adjunct Assistant Professor, School of Planning, January 1, 2006 to April 30, 2006.

Cross Appointment

ROWLANDS, Ian, Associate Professor, Department of Environment and Resource Studies, cross-appointed to the Department of Political Science, January 1, 2006 to June 30, 2007.

Graduate Student Reappointed as a Part-time Lecturer

OLSEN, Daniel, Department of Geography, January 1, 2006 to April 30, 2006.

B. SABBATICALS

TO BE APPROVED BY THE BOARD OF GOVERNORS

SCOTT, Daniel, Assistant Professor, Department of Geography, July 1, 2006 to December 31, 2006, at full salary.



Ellsworth LeDrew
Interim Dean

/aew

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF MATHEMATICS TO SENATE
January 16, 2006

For information:

A. APPOINTMENTS

Definite Term -- Reappointment -- full-time

LI, Xiangzhu, Research Assistant Professor, Dept. of Applied Mathematics, January 1, 2006 – December 31, 2006.

Continuing Lecturer

WOOD, Peter (BMath, 1992; MMath, 1994; PhD, 1999 all from the Univ. of Waterloo), Lecturer, Office of the Dean, July 1, 2006.

Visiting Appointments

ARUGASIAN, Duygu (Middle East Technical University), Research Associate, Dept. of Applied Mathematics, February 1, 2006 – July 31, 2006.

KVIST, Kajsa (Univ. of Copenhagen), Scholar, Dept. of Statistics and Actuarial Science, November 1, 2005 – April 30, 2006.

LA TORRE, Davide (Univ. of Milan), Associate Professor, Department of Applied Mathematics, February 1, 2006 – August 31, 2006.

LOGAN, Adam (Université de Montréal), Scientist, Dept. of Pure Mathematics, April 1, 2006 – July 31, 2007.

Adjunct Appointments

GERHARD, Jurgen, Assistant Professor, David R. Cheriton School of Computer Science, September 1, 2005 – August 31, 2007.

SIMPSON, Bruce, Professor Emeritus, Dept. of Applied Mathematics, October 1, 2005 – September 30, 2008.

VITANYI, Paul (Univ. of Amsterdam), Professor, David R. Cheriton School of Computer Science, November 1, 2005 – October 31, 2008.

Adjunct Reappointments

BURROWS, Brian (Staffordshire Univ.), Professor, Dept. of Applied Mathematics, August 1, 2005 – July 31, 2008.

NIJJAR, Paul, Lecturer, David R. Cheriton School of Computer Science, January 1, 2006 – April 30, 2006.

WATT, Stephen (Univ. of Western Ontario), Professor, David R. Cheriton School of Computer Science, September 1, 2005 – August 31, 2008.

Cross Appointments

AMBAINIS, Andris (Assistant Professor, Dept. of Combinatorics and Optimization), in the David R. Cheriton School of Computer Science, December 1, 2005 – November 30, 2007.

LI, Yuying (Professor, David R. Cheriton School of Computer Science), in the Dept. of Applied Mathematics, December 1, 2005 – November 30, 2008.

Graduate Students reappointed as Part-time Lecturers

BUETTCHER, Stefan, David R. Cheriton School of Computer Science, January 1, 2006 – April 30, 2006.

CAINE, Allan, David R. Cheriton School of Computer Science, January 1, 2006 – April 30, 2006.

GOLAB, Lukasz, David R. Cheriton School of Computer Science, January 1, 2006 – April 30, 2006.

LUSHMAN, Bradley, David R. Cheriton School of Computer Science, January 1, 2006 – April 30, 2006.

MOWBRAY, Duncan, Dept. of Applied Mathematics, January 1, 2006 – April 30, 2006.

Postdoctoral Fellows appointed as Part-time Lecturers

PINTO, Eleanor, Dept. of Statistics and Actuarial Science, January 1, 2006 – December 31, 2007.

B. ADMINISTRATIVE APPOINTMENTS

NG, Chetat, Associate Chair for Graduate Studies, Dept. of Pure Mathematics, January 1, 2006 – June 30, 2007.

C. SABBATICAL

FOR APPROVAL BY THE BOARD OF GOVERNORS

CLARKE, Charles, Associate Professor, David R. Cheriton School of Computer Science, January 1, 2006 – December 31, 2006, with 85% salary.

DJOKOVIC, Dragomir, Professor, Dept. of Pure Mathematics, March 1, 2005 – August 31, 2006, with 100% salary.

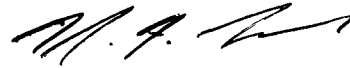
GODSIL, Chris, Professor, Dept. of Combinatorics and Optimization, January 1, 2006 – June 30, 2006, with 85% salary. This is an early sabbatical.

GOULDEN, IAN, Professor, Dept. of Combinatorics and Optimization, July 1, 2006 – June 30, 2007, with 100% salary.

McCOOL, Michael, Associate Professor, David R. Cheriton School of Computer Science, January 1, 2006 – June 30, 2006, with 85% salary. This is an early sabbatical.

RICHMOND, Bruce, Professor, Dept. of Combinatorics and Optimization, September 1, 2006 – August 31, 2007, with 100% salary.

WAN, Justin, Assistant Professor, David R. Cheriton School of Computer Science, September 1, 2006 – February 28, 2007, with 100% salary. This is an early sabbatical.



Thomas Coleman
Dean

UNIVERSITY OF WATERLOO
REPORT OF THE DEAN OF SCIENCE TO SENATE
January 16, 2006

For information:

A. *APPOINTMENTS*

New Probationary Term

LÜTKENHAUS, Norbert, Associate Professor, Department of Physics, January 1, 2006 to June 30, 2009. [Vordiplom Physik (intermediate degree), RWTH Aachen (1989); M.Sc., LMU München (1993); Ph.D., University of Strathclyde (1996); Habilitation, University Erlangen-Nürnberg (2003).] Norbert Lütkenhaus obtained his Ph.D. in theoretical physics, focusing on studies of quantum cryptography and is already internationally known in this area. Dr. Lütkenhaus has written more than 31 papers, with his top five papers having over 360 citations collectively, and has two patent applications as a result of his work. His current research interests involve developing a two-phase model of quantum key distribution, and improving his security proofs for realistic quantum key distribution systems. We are happy to have Dr. Lütkenhaus join our department and the Institute of Quantum Computing. We look forward to his interactions with many researchers in the department and to the further advances we anticipate he will make in the field of quantum computing.

Adjunct Appointments

ALLEN, Lynn C., Associate Professor, Department of Biology, November 1, 2005 to October 31, 2008.

GODDARD, John, Professor, Department of Chemistry, November 1, 2005 to August 31, 2008.

MULLETT, Wayne M., Assistant Professor, Department of Chemistry, November 1, 2005 to August 31, 2008.

NACSON, Sabatino, Professor, Department of Chemistry, November 1, 2005 to August 31, 2008.

SABZYAN, Hassan, Professor, Department of Chemistry, November 1, 2005 to August 31, 2008.

Adjunct Reappointments

CALLENDER, Murchison, (Professor Emeritus), Professor, School of Optometry, September 1, 2005 to August 31, 2008.

EASTMAN, Ann, Assistant Professor, Department of Biology, November 1, 2005 to October 31, 2008.

FARWELL, Andrea J.C., Assistant Professor, Department of Biology, October 1, 2005 to September 30, 2008.

LIDLAW, Mark, Lecturer, Department of Physics, January 1, 2006 to April 30, 2006.

MACKAY, Donald, (Professor Emeritus), Professor, Department of Chemistry, September 1, 2005 to August 31, 2008.

MINNS, Charles K., Professor, Department of Biology, November 1, 2005 to October 31, 2008.

REID, Neville W., Professor, Department of Chemistry, September 1, 2005 to August 31, 2008.

SCHOLTZ, M. Trevor, Professor, Department of Chemistry, September 1, 2005 to August 31, 2008.

SHANKAR, Sunita, Lecturer, School of Optometry, January 1, 2006 to April 30, 2006.

van STAAL, Cees R., Professor, Department of Earth Sciences, December 1, 2005 to November 30, 2008.

Cross-Reappointments

FORSYTH, Peter, Professor, Department of Computer Science cross-appointed to Department of Earth Sciences, July 1, 2005 to June 30, 2007.

Staff Members appointed as Part-time Lecturers

BUNYAN, Stacey, Lecturer, Department of Chemistry, January 1, 2006 to April 30, 2006.

FOR APPROVAL BY THE BOARD OF GOVERNORS

B. SABBATICAL

POWER, Michael, Professor, Department of Biology, September 1, 2006 to August 31, 2007, 93.3% salary arrangements.



D.G. Dixon
Dean of Science

UNIVERSITY OF WATERLOO
REPORT OF RENISON COLLEGE TO SENATE
16 January 2006

For Information:

A. Appointments

Tenured Assistant Professor

Edward Douglas Cowan, B.A., University of Victoria; M. Div. (Hons.), St. Andrew's Theological College; Ph.D., Religious Studies, University of Calgary. Previous appointments: Assistant Professor of Religious Studies and Sociology, University of Missouri-Kansas City. Teaching: social theory, sex and religion, cults, sects, and new religious movements, religion and violence, world religions, religion in America, religious fundamentalism in comparative perspective, film and religion, sacred biography and autobiography. Served on more than 30 graduate student committees. Nominated for seven teaching awards; recipient of two. Publications: six books and two in progress; ten refereed articles and five in progress; nine book chapters and six in press or in progress. Co-General Editor, *Nova Religion: The Journal of New and emergent Religions*. Editor-in-Chief, *The New Religious Movement Homepage* project. Dr. Cowan strengthens the undergraduate and graduate programs in Religious Studies and brings new interdisciplinary strength to Renison's unique Social Development Studies program.

Tenure

Tracy Peressini, (B.A., University of Calgary, M.A., University of Calgary, Ph.D., University of Waterloo), Sociology.

Adjunct Associate Professor – Winter term 2006

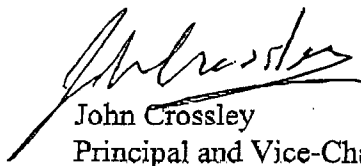
Judi Jewinski, Adjunct Associate Professor of English

Adjunct Assistant Professors – Winter term 2006

Beverley Bell-Rowbotham, Adjunct Assistant Professor of Interdisciplinary Studies
Sandra Campbell, Adjunct Assistant Professor in Social Work
Yan Li, Adjunct Assistant Professor in Chinese and East Asian Studies
Akiko Maruoka, Adjunct Assistant Professor of Japanese
Dale Payne, Adjunct Assistant Professor of Social Work

Lecturers – Part-time - Winter term 2006

Dan Andreae, Lecturer in Social Work
Jon Boyd, Lecturer in Social Work
Deborah Clark, Lecturer in Social Work
De Boer, Catherine, Lecturer in Social Work
Foxall, Kathy, Lecturer in Social Work
Gallagher, Bernadette, Lecturer in Social Work
Susan Hodges Bryant, Lecturer in English
Angela Hovey, Lecturer in Social Work
Susan Hyde, Lecturer in Psychology
Joanna Jacob, Lecturer in Interdisciplinary Studies
Young Gon Kim, Lecturer in Korean and East Asian Studies
Gerry Mueller, Lecturer in Religious Studies
Stefan Rehm, Lecturer in English
Pat Skinner, Lecturer in English
Barbara Swartzentruber, Lecturer in Social Work
Victor Ujimoto, Lecturer in East Asian Studies
John Vardon, Lecturer in English
Gail Wideman, Lecturer in Social Work
Julia Williams, Lecturer in English
Jenny Wong, Lecturer in Chinese
Jan Woynarski, Lecturer in Social Work
Sufeng Xu, Lecturer in Chinese


John Crossley
Principal and Vice-Chancellor

University of Waterloo

SENATE

January 16, 2006

For Information

1. REPORT OF THE SENATE EXECUTIVE COMMITTEE

The Senate Executive Committee, acting on the delegated authority of Senate, agreed to recommend to the Board of Governors the appointment of Professor Deep Saini as Dean of Environmental Studies for a first term ending June 30, 2011, and Professor, with tenure, in the Department of Environment & Resources Studies, both appointments commencing January 1, 2006.

David Johnston
Chair

University of Waterloo

SENATE

January 16, 2006

For Approval

1. COMMITTEE AND COUNCIL APPOINTMENTS

Motion:

That Senate approve the following appointments:

- **Finance Committee** – Jay Thomson (Kinesiology), replacing Steve Prentice, as the Applied Health Sciences faculty representative, term to April 30, 2006.
- **Honorary Degrees Committee** – Jay Thomson (Kinesiology), replacing Steve Prentice, as the Applied Health Sciences faculty representative, term to April 30, 2006.
- **Undergraduate Council** – Scott Barnett (Political Science), replacing Anitta Satkunarajah, as the Arts undergraduate student representative, term to April 30, 2006.

**Report of the Associate Vice-President, Academic
Academic Program Reviews
January 16, 2006**

1. PROGRESS WITH ACADEMIC PROGRAM REVIEWS

To date, UW has completed 39 undergraduate program reviews. What follows are the results of recent reviews related to Recreation and Leisure Studies and Management Sciences.

The following units have completed site visits and are preparing their strategic statements: Faculty of Arts non-departmental programs, Kinesiology, and Religious Studies (including Spirituality and Personal Development). French Studies has recently had its site visit and is awaiting the review team's report. Cognitive Sciences, Health Studies, and Peace and Conflict studies are currently in the review team assessment process, while Physics and Planning are finalizing their self studies.

The Faculty of Engineering's supplemental report related to its last CEAB report is still outstanding.

2. PROGRAM REPORTS

2.1. RECREATION AND LEISURE STUDIES

2.1.1. Review Process

The current review is the first formal review for the undergraduate program in Recreation and Leisure Studies. However, the departmental undergraduate committee has regularly reviewed the program and recommended changes and new initiatives to keep it current.

The graduate program has been regularly evaluated by OCGS, with the most recent review being completed in 1997. Both the MA and PhD level programs were found to be of "Good Quality", the most favourable OCGS designation.

The self study report for this review was submitted in July 2004; the site visit occurred March 2-4, 2005; the review team report was received on March 9, 2005; and the strategic statement from the Chair and the Dean was filed on May 31, 2005.

2.1.2. Characteristics of the Program

Historical Overview

The Department of Recreation was established in 1968. UW was one of the first universities in Canada to offer recreation studies, and the first to offer such a program in the co-operative education format. Since that time, approximately 2300 students have received undergraduate degrees in Recreation and Leisure Studies and the program is one of the two or three largest programs of its type in Canada.

The Department of Recreation and Leisure Studies was the first in Canada to introduce a master's program (1976) and a doctoral program (1994) in leisure studies. In 2002, in conjunction with the Faculty of Environmental Studies, a new master's program in tourism policy and planning was initiated.

The three major fields that the department has developed include administration and management of leisure studies, recreation and leisure resources, and leisure behaviour and cultural studies.

Departmental Objectives

In its self-study report, the Department identified its objectives as the following:

- enhancing health and well-being through the effective use of leisure
- exploring the social, psychological, economic and environmental aspects of leisure
- contributing to the advancement of leisure services
- enhancing the quality of individual and community life

Academic Plans Offered

The department offers five undergraduate academic plans: Honours Recreation and Leisure Studies (regular and co-op), Honours Recreation and Business (regular and co-op), Honours Therapeutic Recreation (regular and co-op); Honours Recreation and Business and Therapeutic Recreation (double major); Four-Year General Recreation and Leisure Studies (regular).

The department also jointly administers two options with the Faculty of Environmental Studies, namely a parks option (open to AHS and ES students) and a tourism option (open to students in all Honours programs).

Joint degree programs have been approved with the following departments: Drama, English, Environment and Resource Studies, Geography, History, Music, Political Science, Psychology, Social Development Studies, Sociology, and Speech Communication.

Student Enrolments

During the seven-year period under review, undergraduate registrations in both the regular and co-op streams of Recreation and Leisure Studies remained remarkably stable until 2002-03, the year of the double cohort, when an increase of some 11% occurred. In 1997-98, there were 179 students registered in regular programs and 167 in co-op compared to 197 regular and 191 co-op students in 2003-04. During the seven year period under review, the average number of RLS undergraduates was 353, and 51 per cent were in co-op programs.

The amount of service teaching provided by the department between 1997 and 2004 also remained relatively stable with numbers of non-RLS students taught annually ranging from 499 to 613. As a proportion of all students taught, they represented between 23 per cent and 29 per cent.

In the past, a small portion (3 per cent) of RLS's total undergraduate teaching was delivered through distance education. No distance education courses were offered by the department after the 1998-99 academic year, since it concluded that the teaching and financial credits that could be generated through distance education courses were not commensurate with the investment required to prepare and mount them.

Student Characteristics and Activities

Entry into RLS is highly competitive with the number of applicants greatly exceeding the number of spaces. Between 1998 and 2002, there were 481 requests on average each year for some 85 positions. The mean final average for students applying from high schools has ranged from 76.6 per cent to 79.9 per cent. On average, students entering a co-op program of study have had final high school grades that are 2-3 percentage points higher than those entering regular programs.

The percentage of students graduating with RLS degrees who were on the Dean's Honours List ranged from 18.1 per cent (1999) to 28.6 per cent (2001), with 21.8 per cent of the graduating class achieving this distinction during the seven-year review period.

Retention rates for the two cohorts of students who had sufficient time to complete degrees during the review period were 69% (1997 cohort) and 55% (1998 cohort). The rate was about 3 per cent higher for those in co-op programs compared to their peers in regular programs. The average number of years to completion was 3.7 for regular students and 4.3 for co-op students; these data compare favourably to UW's averages of 3.7 years for regular programs and 4.7 years for co-op.

According to the department's analysis, during the seven year review period approximately 18 per cent of students in the first year cohort were required to withdraw for not maintaining grades required to continue in the department's honours programs. To deal with this issue, the department implemented a four-year general program to provide such students with an opportunity to improve their grades and to re-enter the honours programs. After the first two years of operating this program, 15 of the 30 students transferred to the general program were readmitted to the honours program.

RLS majors are eligible to join AHSUM (Applied Health Sciences Undergraduate Majors), a body created to enhance the academic and social life of all AHS students. Representatives from AHSUM sit on departmental, faculty and university committees that pertain to undergraduate student issues, and on the Federation of Students council.

Information gathered by several annual surveys of graduates eight months after graduation found that on average 60 per cent of RLS grads entered employment while another 27 per cent pursued additional education. The remainder were travelling, still looking for jobs, or were not able to be traced. Just over 75 per cent of those who had taken first jobs were employed in the recreation and leisure services area in the public (e.g. hospitals, government), not-for-profit (e.g. YMCA, Scouts Canada) and private (e.g. hospitality, retail) sectors. For those proceeding for additional academic degrees, teachers' education (57 per cent) and graduate studies (19 per cent) were the two most popular choices. Of the 46 master's students who graduated during the review period, nearly 30% went on to doctoral studies and of the 12 doctoral students who graduated, all subsequently obtained university appointments. Altogether, 20 of RLS master's and doctoral students have had their work published in refereed journals, including the top journals in the recreation, leisure and tourism fields.

Faculty

The department currently has 15 faculty members (seven women and eight men), and one senior demonstrator. During the review period, there were two retirements and three hires. Four faculty members are due to retire by 2011.

All faculty teach in both the undergraduate and graduate programs, and ten professors are approved doctoral dissertation supervisors. In addition, two faculty members in Environmental Studies are cross-appointed with RLS and are core faculty for graduate programs in recreation and leisure resources. One adjunct professor from Brock and two adjunct professors from Guelph are involved in the graduate program. Over the period covered by the self study, the department hosted some twenty visiting scholars from around the world. While at UW, they were provided with access to office, computer and library resources, and many gave presentations and seminars focussing on their research that were open to undergraduate and graduate students.

PhD candidates in RLS are often used to replace full-time faculty on sabbatical to deliver core courses. The department emphasises the role of teaching in graduate student education by assigning TAs and expecting those appointed to engage in appropriate training, including a university-sponsored "TA Day" and the workshops on teaching offered by TRACE.

The standard teaching load is four term courses with course reductions for those faculty members who carry administrative responsibilities. For faculty with ADDS (approved doctoral dissertation supervisor) status, the course load is normally composed of three undergraduate courses and one graduate course. Faculty members also routinely teach undergraduate and graduate reading and directed studies courses, are involved in supervision of undergraduate honours research projects and/or graduate theses, and serve on theses and dissertation comprehensive examination committees.

The teaching of all RSL undergraduate and graduate courses is evaluated each term. For six of the seven years included in the review period, 90 per cent of the department's courses and instructors were rated between 3 (satisfactory) and 5 (excellent). One member of the department has received a UW Distinguished Teaching Award.

RLS faculty are heavily involved in research on an individual basis and increasingly as members of interdisciplinary research teams within AHS, with faculty members from other UW Faculties, and with scholars from elsewhere. Over the past seven years, the department's research funding derived from grants and contracts totalled more than \$2 million. Recognition of RLS faculty members' leading-edge scholarship has come in many forms: publications in high quality journals, invitations to present at international meetings, invitations to serve on editorial boards and on national and international review panels, and invitations to act as expert consultants to national and international organizations. Seven members have been elected to the U.S. Academy of Leisure Sciences in recognition of their career contributions to leisure research, and two members have been elected to serve as President of that association. In addition, six faculty members have been singled out for other professional awards and distinctions.

2.1.3. Main Strengths

The review team found that the interdisciplinary strengths of the faculty members positioned them well to achieve the department's objectives, and that those objectives were well aligned with UW's focus on health-related research. Moreover, the reviewers stressed that the RLS faculty members have made "an important contribution to the profession through the dissemination of research that addresses how leisure and recreation enhances health within communities and in contexts that extend beyond the traditional medical model", and have furthered "the profession's understanding of the role

of leisure in the lives of marginalized individuals and groups." Faculty members' significant contribution to their profession through their work on behalf of scholarly journals and as elected officers for North American organizations was also noted.

In the area of teaching, the review team noted the positive impact of faculty members' research in the classroom, and the high level of student satisfaction as evidenced by the student course evaluations and the satisfaction survey conducted by AHS in 2000. It also noted the positive ways in which graduates are using their degrees, either through employment directly related to their field of study or by pursuing graduate work.

2.1.4. Concerns and Opportunities for Improvement

Given the recent increases in undergraduate enrolments and the growth of the graduate program, the reviewers recommended that the department give serious consideration as to how to maintain the high quality of teaching in both areas and also permit faculty members to maintain their active research agendas. They encouraged the department to expand and enhance teaching opportunities for doctoral students in the undergraduate program. Ways in which this goal might be achieved include working with TRACE, and providing sessionals with more consistent supervision, perhaps through the assignment of a specific faculty member to act as a mentor.

The reviewers also encouraged the department to explore increased use of UW ACE as part of its teaching strategy, and to provide incentives to faculty to attend training sessions designed to foster teacher effectiveness. In addition, they recommended that the department explore ways of increasing the number of courses taught during the Spring semester, such as requiring each faculty member to teach at least one Spring course prior to sabbatical and identifying courses across campus that might be appropriately cross-listed with RLS.

The review team noted that there are opportunities for the department to engage in distance education, but that RLS will need additional resources if it is to do so.

With regard to co-op programs, the reviewers repeated the observation made in the departmental self study that some upper year students transfer into regular programs due to the small number of available senior co-op jobs. They recommended that it would be helpful to have co-op field coordinators assigned to specific programs such as RLS, and that they be given sufficient time for job development. In their opinion, the RLS co-op program might well benefit from a review regarding the "rigor and the appropriateness of placements."

Another area that the reviewers felt merited additional attention was the promotion and marketing of RLS, off and on campus. Efforts should be made to increase awareness of RLS among high school students to aid in student recruitment; among UW colleagues to strengthen interdisciplinary collaboration; and among UW students to increase the numbers entering the department's graduate programs. Enhancing communication and soliciting support from alumni to help increase endowments and expand the number of upper-level co-op placements were among the other suggestions made by the reviewers. Alumni opinions regarding the RLS curriculum could be used by the department in conjunction with those of current students to assist in making decisions about the nature and structure of the curriculum.

2.1.5. Strategic Plan

In response to the review team's report, RLS has identified four areas of strategic focus to strengthen the department's high quality undergraduate program:

- increasing the visibility of RLS
- enhancing instructional capacity
- working towards improved co-op education experiences
- increasing communication with alumni

1. Increasing the visibility of RLS

Marketing and promoting the program to high school students will be accomplished through the enhancement of the department's web pages with particular attention to prospective students. The department will also work with the AHS recruitment and publications co-ordinator and with current students to find additional ways to provide relevant promotional materials and information to high school counsellors and teachers in select disciplines. If additional teaching resources can be engaged, more students from across campus might be accommodated in RLS courses that match their own interests and areas of academic specialization. Encouragement will be given to faculty members to expand their interdisciplinary research activities in order to increase knowledge and understanding of leisure research.

2. Enhancing Instructional Capacity

In keeping with the reviewers' recommendation and UW's support for graduate growth, the department will explore the possibility of expanding its doctoral program and providing each doctoral student with the opportunity to teach at least one undergraduate course as a sessional lecturer during the degree program. At the same time, the department plans to introduce a more formalized system of supervision and support for sessional lecturers. With the assistance of TRACE, a first discussion session on teaching for faculty members was held in April 2005 and another for faculty and graduate students in Fall 2005. There will be ongoing encouragement for all instructors to attend such workshops and seminars conducted both within and outside of the department.

Planning will continue with regard to faculty renewal, and if financing permits, bridge appointments will be made to upcoming retirements. New hires will be made in light of emerging topics of importance for the discipline such as diversity and cross-cultural studies. As part of its commitment to enhancing its instructional capacity, the department will examine how it might respond to the need for distance education.

3. Working towards improved co-op education experiences

The department will work with Cooperative Education and Career Services to ensure the availability of appropriate work placements for students at all levels of education and experience. It will encourage faculty and staff to be more proactive in the identification of more upper level work experiences. It will also work to find ways to provide more courses in the Spring term.

4. Increasing communication with alumni

The department will create new ways to communicate regularly with alumni and will conduct more frequent surveying of alumni with respect to their educational and

professional experiences. It will also create an alumni advisory board to help oversee the distribution of funds from the departmental 25th anniversary alumni fund. Through these various means, RLS aims to obtain alumni advice regarding program changes, encourage alumni to hire RLS co-op students, raise the profile of RLS, and increase support for scholarships and endowments.

2.2. MANAGEMENT SCIENCES

2.2.1. Review Process

The review process followed the Senate guidelines for the review of interdisciplinary program options. This is the first formal University review of the undergraduate option, but it has been included in the periodic Faculty of Engineering Canadian Engineering Accreditation Board (CEAB) reviews. MSCI graduate programs have also been successfully reviewed a number of times by the Ontario Council for Graduate Studies (OCGS).

The self study report was submitted in September 2004. A review team, consisting of three UW faculty members, interviewed students, faculty members and administrators associated with the program during the Winter 2005 semester and submitted its report on May 4, 2005. The departmental statement containing the strategy for the next seven years was received on September 13, 2005.

2.2.2 Characteristics of the Program

Historical Overview and Offerings

The field of management sciences deals with the application of scientific methods to managerial decision making. The current focus of the department is on the management of technology, information systems, and applied operations research. According to the department's self study, both the positioning of MSCI within Engineering and the MSCI undergraduate option are unique in Canada.

The Department of Management Sciences, established in 1969, offers MMSC, MASc and PhD degrees but does not currently have an undergraduate degree program. Nonetheless, a significant portion of its teaching activity is focused at the undergraduate level, and since 1975 it has offered a designated option in management sciences within the Faculty of Engineering. Originally the option consisted of eight courses, but the number was reduced to seven in 1987 in order to make room for new CEAB requirements, and currently stands at six courses.

MSCI courses are also taken by undergraduate Engineering students as part of their CEAB requirements and by some students outside of Engineering. Non-Engineering programs that recommend/permit MSCI undergraduate courses include five in Mathematics, 3 in Arts, 1 in Science, 1 in AHS, and 1 in ES.

Students

During the review period, student interest in the Management Sciences Option remained strong, with from 15% to 18% of all Engineering graduates completing it. The proportion of Engineering students graduating with options who chose MSCI as their

option declined from over 60 per cent to 50 per cent. In 2003, of the 675 engineering students who graduated, 236 graduated with an option and half of them chose the MSCI option. The department cites various reasons to explain the apparent decline in the relative popularity of the MSCI option, including the increase in the number of options within Engineering, the addition of new Engineering degree programs, encroachment by some Engineering departments into time slots reserved in the past for non-technical electives, and changes in timetabling brought about by the new Student Information System Project (SISP).

Not surprisingly, Engineering students accounted for 61-72 per cent of the undergraduate course enrolments in MSCI between 1997 and 2003, with those from Math comprising the second largest group of enrollees (14-24 per cent).

Faculty

Management Sciences is a full-fledged department within Engineering and accordingly, it is directed by a Chair. Management of undergraduate teaching activities are shared with an associate chair for undergraduate studies and an MSCI Option coordinator.

The department has 16 full-time faculty members, one lecturer, 12 adjunct professors and one adjunct lecturer. A number of faculty members have cross-appointments with other UW departments. At the time that the self study report was written, 5 retirements were expected by 2012.

The expected regular teaching load for full-time faculty members is four courses each calendar year.

Most MSCI faculty are actively involved in research: the average numbers of refereed journal articles or conference papers per regular faculty member were 3.4 in 2001, 1.9 in 2002 and 3.4 in 2003. Members were also active in presenting research at conferences, publishing books and book chapters, engaging in collaborative research with researchers in other Engineering departments and at other universities, and serving on editorial boards. A number of MSCI faculty have won national and international awards for their research efforts; the department is particularly well known for its operations research. Other areas of particular strength include applied organizational research, information systems management, management of technology, and research into on-line teaching. Some MSCI faculty members are also actively involved in UW research centres such as the University of Waterloo Management of Integrated Manufacturing Systems (WATMIMS) and the Institute of Innovation Research (IIR).

2.2.3. Main Strengths

The review team noted the continued popularity of the MSCI undergraduate option among Engineering students and the important role the department has played in the education of Engineering and other students at UW.

The reviewers also endorsed the department's stated plans to develop a full undergraduate degree program.

2.2.4. Concerns and Opportunities for Improvement

Noting the drop in the percentage of Engineering students taking the MSCI option indicated in the self study, the review team recommended that the department work with those responsible for scheduling to optimize class schedules to make it more convenient for students to take courses contributing to the option. It noted a current imbalance of registrations across courses offered as part of the option and recommended that the department attempt to increase enrolments in courses other than those dealing with organizational behaviour.

The reviewers also noted the uneven distribution of full-time faculty across the ranks with eight full professors, two associate professors and six assistant professors. They suggested that, if the new undergraduate degree program is approved, a concerted effort be made to hire a substantial number of faculty members with PEng status at the associate or full rank.

The review team also expressed concern over the low research productivity of some of the non-tenured faculty members, and encouraged the department to address the reasons for this situation and to take supportive action such as mentoring, balancing teaching loads, and hosting research seminars.

Given the anticipated significant increase in the number of undergraduate students with the introduction of the new degree program, the reviewers recommended that there be an increase in the number of graduate students, in particular in the numbers of PhD students and master's students doing theses. Such growth would attract new faculty members and provide an important source of teaching assistants to help with undergraduate instruction.

On a University-wide basis, the review team noted the proliferation of business programs in recent years and indicated that this expansion raises significant issues regarding resources, space, support facilities, and the availability of co-op positions. To examine these issues further, the team recommended that the Associate Vice-President Academic create a committee to examine and report on these issues.

2.2.5. Strategic Vision

In its strategic statement, the department responded to the comments and recommendations of the review team in the following manner:

1. Increasing Enrolments

The provision of the MSCI option remains a strong priority for the department, and it looks forward to enriching the selection of courses if the proposed Management Engineering degree is approved. The department's Vision 2010 plan, developed as part of a Faculty-wide planning process, includes a number of observations and recommendations regarding increasing enrolments, particularly in higher-level courses. MSCI is also investigating the possibility of offering some of its upper level courses in the evening to increase accessibility for all UW students and putting its high enrolment Engineering Economics course into an on-line format.

The department has developed some new mechanisms for publicizing the Option (e.g. highlighting it on the department and Faculty web sites, holding information sessions), and these efforts will be intensified.

2. Research Productivity at the Assistant Professor Level

The department noted that some faculty members at this level are aiming to publish primarily in the top tier journals in the world, and that such journals frequently have long review and publication lead times. In general, journals in Management Sciences tend to have longer review and publication lead times compared to those in some other branches of Engineering. The department will continue to ensure that junior faculty members who teach larger introductory courses are provided with teaching assistants and other forms of support, and to mentor them. In its Vision 2010 document, the department calls for increased TA support from 1 TA per 58 students to 1 TA per 50 students.

3. Balance across the academic ranks

In its Vision 2010 plan, the department has identified the need to hire at various levels of the professoriate.

4. Increasing the number of faculty members with PEng status

The Vision 2010 plan calls for the hiring of faculty with PEng or PEng eligible status. If the department's undergraduate program is approved, current faculty who are eligible for PEng status will be strongly encouraged to secure it.

5. Proliferation of business programs at UW

The Math-Business coordinator for the Faculty of Mathematics has already initiated a series of meetings among the various "X and Business" advisors to determine how to develop a coordinated approach to offering business-type programs at UW. MSCI will continue to participate in these discussions.

6. Establishing an industry advisory board

To secure advice on the relevance of the Option and its other activities, the department plans to establish an industrial advisory board. The board is also envisaged as a way to identify potential speakers, access potential employment opportunities, and generally increase the visibility of the department.

4. UW FACULTY MEMBERS WHO SERVED AS INTERNAL REVIEWERS

Dr. Sandra Burt, Arts
 Dr. Keith Hipel, Engineering
 Dr. Duane Kennedy, Arts
 Dr. Henry Wolkowicz, Mathematics

5. GENERAL COMMENTS AND OBSERVATIONS

The reviews of the two academic units included in this report illustrate once again UW's leadership in establishing distinctive and innovative academic programs. They also point to the contributions that departments are making to interdisciplinary teaching and learning, and to the strong interface between research and teaching.

These reviews also identify recurrent institutional issues that deserve attention and action including more effective publicizing of existing academic programs, the maintenance/expansion of UW's distance education offerings, improving the quantity and

quality of work placements available to students in cooperative education programs, making more effective use of alumni to support academic programs, and coordinating various offerings in the area of business.

University of Waterloo
SENATE GRADUATE & RESEARCH COUNCIL (SGRC)
REPORT TO SENATE, January 16, 2006

SGRC met on November 21, 2005, and agreed to forward the following items to Senate for approval and information. [*additional documentation for all items available in the Secretariat*]

FOR APPROVAL

CENTRES & INSTITUTES

Removal from Senate-approved list: Centre for Applied Health Research (CAHR).

Paul McDonald, Health Studies & Gerontology, Director (former Directors Boyd Suttie and Mike Sharratt) CAHR was initiated and approved by Senate in 1984; renewed in 1990, 1995, 2000 for five-year terms. It was the umbrella organization for a number of research, educational, and service units in the general health domain.

After consulting with CAHR partners and the Dean of Applied Health Sciences, Professor McDonald (Director) notified SGRC of the decision not to seek renewal of the Centre. He asked, and Council concurred, that the Centre be dissolved at the earliest available opportunity. Council heard that evidence shows that CAHR has served the University and its members with distinction. CAHR began in 1984 with a mandate to advance applied health research at UW by serving the collective needs of several small research teams. In the past few years, several of these teams and groups, such as the Centre for Behavioural Research and Program Evaluation (CBRPE), the Population Health Research Group (formerly the Health Behaviour Research Group), the Ergonomics & Safety Consulting Service, and UW Fitness have grown substantially. Indeed, they no longer require the additional services traditionally provided by CAHR. Several other CAHR projects and affiliates, including the Murray Alzheimer Research & Education Program, the Functional Abilities Program, and the Neurobehavioural Assessment & Rehabilitation Program also continue to prosper but have interests that are closely related to the new (January 2005) Research Institute for Aging. The final affiliate, the Program Training & Consultation Centre, has interests closely related to those of the Population Health Research Group and will, therefore, be nested within its structure.

CAHR has been a fabulous success, but new challenges require new responses. Five years ago, the collective budgets of CAHR partners totaled approximately two million dollars; today, they have a collective budget of more than five million dollars. CAHR has served as an effective incubative nest but the time has come for its partners to "leave its nest" so they can continue to prosper and grow.

FOR INFORMATION

Council reviewed and, on behalf of Senate, approved the following:

1. CURRICULAR ITEMS

Faculties of Arts and Environmental Studies: program changes; new courses; changes to existing courses and course inactivations.

2. GRADUATE STUDENT SCHOLARSHIPS, AWARDS

- Polymer Technologies Graduate Scholarship
- The Power Corporation of Canada / Great-West Life Assurance Company / London Life Insurance Company / Canada Life Assurance Company: Distinguished Visitors and Fellowships Program

Dean of Graduate Studies: Recent Trip to India. Council received a copy of the Dean's written report and heard that there appear to be many worthwhile collaborative ventures to consider pursuing and top quality students available to recruit.

University of Waterloo

SENATE SCHOLARSHIPS & STUDENT AID COMMITTEE

Report to Senate -- January 16, 2006

The Senate Scholarships & Student Aid Committee forwards the following items to Senate for information [*further details available from the Secretary, x 5924*]:

New Scholarships/Awards/Bursaries for Calendar Publication 2006/2007

ENTRANCE SCHOLARSHIPS AND AWARDS

Rod Barr Entrance Scholarship

One scholarship, valued at up to \$2,400, is awarded annually to an outstanding student entering first year of the Bachelor of Accounting and Financial Management program in the School of Accountancy. This fund is made possible by a donation from Rod Barr because of his dedication to the University of Waterloo's School of Accountancy.

W. J. Beynon Memorial Entrance Scholarship

A scholarship, valued at \$2,500, is awarded annually to an outstanding undergraduate student entering first year in the Faculty of Engineering at the University of Waterloo and who is a resident of the County of Lambton in the Province of Ontario. This fund is made possible by a donation from the Beynon Family in honour of W.J. Beynon.

Computational Mathematics Entrance Scholarships

Several scholarships, valued at up to \$2,000 each, are awarded annually to outstanding first-year students entering the Computational Mathematics program. Selection is based on a combination of high school admission marks, results of the Euclid Mathematics Contest and extracurricular achievement as assessed through the Admission Information Form.

Conestoga-Rovers & Associates Entrance Scholarships

Several scholarships, valued at up to \$5,000 each, are awarded annually to undergraduate students entering first year of either Civil Engineering in the Faculty of Engineering or to students interested in pursuing a major in Earth Sciences in the Faculty of Science. These scholarships are made possible by a generous donation from three founders of Conestoga-Rovers & Associates: Don Haycock, Frank Rovers and Ron Schwark.

Downsview Secondary School Alumni Entrance Award

An award, valued at up to \$1,000, is given annually to an undergraduate student entering first year at the University of Waterloo who has a demonstrated financial need. To be considered, students must complete the University of Waterloo Entrance Bursary Application which is available in early March each year from the www.findoutmore.uwaterloo.ca website. This fund is made possible by a donation from a Downsview Secondary School alumnus who wishes to assist students from his high school to attend UW.

Andrew Dunn Entrance Scholarships

Two scholarships, valued at approximately \$2,400 each, are awarded annually to outstanding undergraduate students entering first year of the Bachelor of Accounting and Financial Management program in the School of Accountancy. This fund is made possible by the generosity of alumnus Andrew Dunn, CA because of his commitment to excellence at the University of Waterloo.

Isabel Farrar Entrance Scholarships

In 2004, Deanne Farrar (BMath 1988) and Sean Capstick (BASC 1989) established a fund for outstanding first-year undergraduate female students entering the Faculty of Mathematics and the Faculty of Engineering at the University of Waterloo. The scholarships were created in honour of Ms. Farrar's mother, Isabel Farrar who was a Mathematics teacher and who played an instrumental role in encouraging her daughter and other young women to study Mathematics. Several scholarships, valued at \$4,000 each, will be awarded to outstanding students based on a combination of high school admission marks, results of the Euclid Mathematics Contest (Mathematics students only) and extracurricular achievement as assessed through the Admission Information Form.

NOVA Chemicals Entrance Scholarships

Two scholarships, valued at \$1,000 each, are awarded annually to undergraduate students at the University of Waterloo. One scholarship shall be awarded to a student entering first year of the Physical Sciences program in the Faculty of Science and the other scholarship shall be awarded to a student entering the Chemical Engineering program in the Faculty of Engineering. These scholarships are made possible through a donation from NOVA Chemicals Corporation in recognition of their long standing relationship with the University of Waterloo through co-op and graduate hires from the Faculties of Science and Engineering.

The Walter Fedy Partnership Entrance Scholarships

Two scholarships, valued at \$1,500 each, are award annually to outstanding first-year students: one to a student entering Chemical, Civil, Electrical or Mechanical Engineering and one to a student entering the Architecture program. This fund is made possible by a donation from The Walter Fedy Partnership because of their long relationship with the University of Waterloo including the hiring of co-op students and graduates.

UW Alumni@IBM Engineering Entrance Scholarship

One scholarship, valued at up to \$3,000, is awarded annually to an outstanding student entering first year in the Faculty of Engineering or Software Engineering. This fund is made possible by donations from Engineering Alumni working at IBM.

Whiteside Family Entrance Scholarship in Arts

A scholarship, valued at \$2,000, is awarded annually to an outstanding undergraduate student entering first year in the Faculty of Arts at the University of Waterloo. Selection will be based on marks and community and/or extra-curricular school involvement including sports or intramurals. To be eligible for consideration, students must complete the Admission Information Form. This fund is made possible by a generous donation from Judson D. Whiteside and his family.

UPPER-YEAR SCHOLARSHIPS/AWARDS/BURSARIES:

Bessie Elnora Cleary Award

A \$250 prize is to be awarded annually to a Classical or Medieval Studies student going to an accredited Teacher's College based on academic achievement. Preference will be given to students applying to a Teacher's College in Ontario who intend to teach at the Primary level.

Computational Mathematics Undergraduate Scholarships

A number of scholarships are awarded each year to outstanding undergraduate students enrolled in full-time studies in the Computational Mathematics program. The number and value of the scholarships varies from year to year. Selection is based on academic achievement. No application is required.

Computational Science Work Report Award

One award, valued at \$100, may be presented annually to an Honours Co-op Computational Science student, recognizing an exemplary work term report.

C. D. Howe Memorial Foundation Bursary for International Trade

Bursaries, valued at up to \$2,000 each, are awarded annually to undergraduate students enrolled in Year Three or Four of the International Trade Specialization in the Faculty of Arts who are interested in participating in an international work or study experience. Interested students who have demonstrated financial need and who are in good academic standing should submit an application by October 15th. This fund is made possible by a donation from the C. D. Howe Memorial Foundation to recognize Mr. Howe's significant contributions to Canada's economic prosperity.

C. D. Howe Memorial Foundation Scholarships for Excellence in International Trade

Scholarships, valued at \$1,500 each, are awarded annually to outstanding undergraduate students enrolled in Year Two, Three or Four of the International Trade Specialization in the Faculty of Arts. Selection is based on academic achievement. This fund is made possible by a donation from the C. D. Howe Memorial Foundation to recognize Mr. Howe's remarkable contribution to Canada's economic development.

Hydro One Networks Inc. Undergraduate Scholarships

Five scholarships, valued at \$2,000 each, are awarded annually to outstanding undergraduate students enrolled in Year Four of the Electrical and Computer Engineering program in the Faculty of Engineering. Selection is based on academic excellence and a demonstrated interest in power engineering as evidenced through enrolment in fourth-year power engineering courses. This fund is made possible by a donation from Hydro One Networks Inc. to encourage engineering students to consider a career in the Power and Energy industry.

Vinko and Iva Juricic Award for Perseverance

This \$200 award and plaque honours a fourth-year Optometry student who has been faced with challenges (medical and/or personal) during their Optometry studies.

Jim Kalbfleisch Award

An award, valued at up to \$1,500, is awarded annually to an undergraduate student enrolled in Year Two, Three or Four of any program in any Faculty who has achieved a minimum overall average of 75% and who has demonstrated their involvement in student government at UW. Interested students should submit an application by October 15th. This fund is made possible by a donation from Jim Kalbfleisch and his friends and family in honour of his retirement.

McCall MacBain International Undergraduate Scholarship

A number of scholarships, valued from \$1,000 to \$5,000 each, will be available each term to students in any Faculty with strong academic standing (minimum 80% overall average) who wish to participate in an international work experience that highlights their entrepreneurial work skills. The experience may

involve paid or unpaid work with either private or public sector organizations. This fund is made possible by a donation from John McCall MacBain because of his belief in the value of international work experiences.

Elwin N. Neuru MD Senior Latin Award

A \$250 prize is to be awarded annually to the Honours Classical or Medieval Studies student obtaining the highest average in a minimum of two 300-level Latin courses in the third year of language study. To qualify, the student must continue in a 400-level Latin course.

Science and Business Work Report Award

One or more awards, valued at \$100 each, are presented annually to Honours Co-op Science and Business students, recognizing exemplary work term reports.

Michael T. Sharratt Award

An award, valued at \$500 is presented annually to an undergraduate student enrolled in Year Three or Four in the Faculty of Applied Health Sciences who has achieved a minimum overall average of 75% and who has demonstrated their involvement in sports and physical activities and volunteer efforts in the community. Interested students should submit an application by October 15th. This fund is made possible by donations honouring Michael T. Sharratt's term as Dean of Applied Health Sciences from 1998-2005.

2005/2006 Entrance Scholarships

See Attachment #1.

2005 UW Bursary Program Summary (Entrance and Upper-year)

Attachment #2 provides a summary of the bursary program established per the Minister of Education and Training to assist undergraduate students if personal and family resources are not adequate to meet the cost of education-related expenses (neither the admission average nor the Faculty in which the student is enrolled is a factor when making bursary decisions). Students who did not apply for entrance bursaries when they joined UW can apply for subsequent bursary support once they arrive

/tlc
December 15, 2005

Steve Brown
Chair

2005/06 Entrance Scholarship Summary

Attachment #1

Name & Total Value of Award	* Source of Funding	# of awards available	**Total money available	# of awards offered	# of awards accepted	** Total money spent	% of Offers Accepted
Faculty of Applied Health Sciences							
Lyle S. Hallman Entrance Scholarship - \$2,500	E	3	\$7,500	6	3	\$7,500	
President's Scholarship - \$2,000 (unlimited)	O	30	\$60,000	182	30	\$60,000	
Dean's Entrance Scholarship- \$1,000	O	13	\$13,000	63	13	\$13,000	
Health Studies Entrance Scholarship - \$1,000	S	5	\$5,000	19	5	\$5,000	
Kinesiology Entrance Scholarship- \$1,000	S	18	\$18,000	92	14	\$14,000	
Recreation & Leisure Studies Entrance Schol - \$1,000	S	7	\$7,000	23	5	\$5,000	
2005 Totals		76	\$110,500	385	70	\$104,500	18.2
2004 Totals		107	\$111,500	451	101	\$105,500	22.4
2003 Totals		57	\$61,500	243	51	\$55,500	21.0
Faculty of Arts							
Lloyd Carr-Harris Foundation Schol - \$16,000/4yrs	A	1	\$4,000	1	1	\$4,000	
M. Keith Entrance Scholarship - \$10,000/4yrs	E	3	\$7,500	7	3	\$7,500	
School of Accountancy Fellowships - \$6,000/4yrs	O	20	\$20,000	27	20	\$20,000	
J.S. Minas Entrance Scholarship - \$5,000/4yrs	E	1	\$2,000	2	1	\$2,000	
Bill Harvie Scholarship - \$5,000/4yrs	E	1	\$1,000	1	1	\$1,000	
Brian Hendley Entrance Scholarships - \$3,000	E	1	\$3,000	1	1	\$3,000	
Boris & Karen Bong Entrance Scholarship - \$3,000	A	1	\$3,000	1	1	\$3,000	
Arts Alumni Entrance Scholarship - \$3,000/2yrs	E	10	\$20,000	41	10	\$20,000	
Robert Kerr Entrance Scholarship - \$2,500	E	3	\$7,500	3	3	\$7,500	
President's Scholarship - \$2,000 (unlimited)	O	170	\$340,000	643	170	\$340,000	
Catherine E.B. Hanna Entrance Scholarship- \$2,000	E	4	\$8,000	7	3	\$6,000	
Mary Gerhardstein Entrance Schol - \$1,500	O	1	\$1,500	1	1	\$1,500	
J. Downey Entrance Scholarship - \$1,500	E	1	\$1,500	3	1	\$1,500	
Arts Faculty Entrance Scholarship - \$1,000 (87%-89.9%)	S/O	66	\$66,000	350	64	\$64,000	
Lithgow Entrance Scholarship - \$1,000	E	5	\$5,000	8	5	\$5,000	
David T. Carter Scholarship - \$1,000	A	1	\$1,000	1	1	\$1,000	
Robin K. Banks/Pacioli Entrance Scholarship - \$1,000	E	1	\$1,000	1	1	\$1,000	
Morley Lemon Family Scholarship - \$1,000	E	2	\$2,000	2	1	\$1,000	
Muriel Shepherd Entrance Scholarship - \$1,000	E	1	\$1,000	1	1	\$1,000	
National Trust Accounting Scholarship - \$1,000	E	2	\$2,000	4	2	\$2,000	
William J. Schlatter Scholarship - \$1,000	E	2	\$2,000	5	2	\$2,000	
Arts Faculty Entrance Scholarship - \$500 (84%-86.9%)	S/O	115	\$57,500	629	107	\$53,500	
Mary Rosenthal Entrance Scholarship - \$500	E	3	\$1,500	7	3	\$1,500	
2005 Totals		415	\$558,000	1,746	403	\$549,000	23.1
2004 Totals		374	\$316,500	1,976	374	\$316,500	18.9
2003 Totals		220	\$182,500	2,010	222	\$183,500	11.0

*Source of Funding:

A= Annual Donation; E=Endowment;
 O=Other, eg. Faculty funds;
 S=Senate Scholarship Fund

**Amount student receives
 in Year One only.

2005/06 Entrance Scholarship Summary

Name & Total Value of Award	* Source of Funding	# of awards available	**Total money available	# of awards offered	# of awards accepted	** Total money spent	% of Offers Accepted
Faculty of Engineering							
Colonel Hugh Heasley Scholarship - \$10,000/4yrs	E	6	\$24,000	12	6	\$24,000	
Arthur F. Church Mechanical Scholarship - \$5,000	E	2	\$10,000	4	2	\$10,000	
UW/FIRST Mechatronics Scholarship - \$5,000	O	1	\$5,000	2	1	\$5,000	
Paul B. Spafford Entrance Scholarship - \$5,000	E	1	\$5,000	2	1	\$5,000	
CAE Inc. Scholarship in Mechatronics - \$5,000/4yrs	E	1	\$2,000	1	1	\$2,000	
Engineering Faculty/Staff Entrance Scholarship - \$4,000	S	2	\$8,000	4	2	\$8,000	
Engineering Entrance Scholarship - \$4,000	E/O	11	\$44,000	30	9	\$36,000	
Nortel Networks Scholarships - \$3,500	E	12	\$42,000	24	12	\$42,000	
Chandrashekar Shad Valley Memorial - \$3,500	E	1	\$3,500	2	1	\$3,500	
R & E Madter Entrance Scholarship - \$3,500	E	4	\$14,000	7	4	\$14,000	
Shell Canada Entrance Scholarship - \$3,500	E	1	\$3,500	2	1	\$3,500	
JNE Consulting Entrance Scholarship - \$3,500	A	2	\$7,000	3	2	\$7,000	
Leslie Klein Entrance Scholarship - \$3,000	E	1	\$3,000	2	1	\$3,000	
Robert Kerr Entrance Scholarship - \$2,500	E	1	\$2,500	1	1	\$2,500	
Engineering Entrance Scholarship - \$2,500	E/O	87	\$217,500	187	49	\$122,500	
President's Scholarship - \$2,000 (unlimited)	O	282	\$564,000	723	282	\$564,000	
UW Alumni@Microsoft Engineering Scholarship - \$2,000	E	1	\$2,000	1	1	\$2,000	
Chachra Family Entrance Scholarship - \$2,000	E	1	\$2,000	2	1	\$2,000	
E. Alarie Memorial Scholarship - \$2,000	E	1	\$2,000	1	1	\$2,000	
Sherbourne-Roord Memorial Scholarship - \$1,500	A	1	\$1,500	2	1	\$1,500	
Sony of Canada Scholarship - \$1,500	A	1	\$1,500	1	1	\$1,500	
Canadian General Tower Scholarship - \$1,500	E	1	\$1,500	2	1	\$1,500	
O.P.E.F. Scholarship - \$1,000	A	2	\$2,000	3	2	\$2,000	
Motorola Engineering Scholarship - \$1,000	E	1	\$1,000	1	1	\$1,000	
Carl A. Pollock Engineering Scholarship - \$1,000	E	5	\$5,000	10	5	\$5,000	
2005 Totals		429	\$973,500	1,029	389	\$870,500	37.8
2004 Totals		429	\$785,500	919	532	\$774,500	57.9
2003 Totals		110	\$365,000	238	95	\$325,000	39.9
Faculty of Environmental Studies							
President's Scholarship - \$2,000 (unlimited)	O	14	\$28,000	81	14	\$28,000	
Canadian General Tower Scholarship - \$1,500	E	1	\$1,500	2	1	\$1,500	
Environment & Business Entrance Scholarship - \$1,000	O/S	10	\$10,000	31	8	\$8,000	
Environment & Resource Studies Entrance Schol - \$1,000	O/S	16	\$16,000	49	11	\$11,000	
Geography Entrance Scholarship - \$1,000	O/S	15	\$15,000	43	13	\$13,000	
Planning Entrance Scholarship - \$1,000	O/S	9	\$9,000	20	8	\$8,000	
Planning Alumni Entrance Scholarship - \$1,000	A	5	\$5,000	13	5	\$5,000	
Peter Nash Entrance Scholarship - \$500	E	1	\$500	2	1	\$500	
2005 Totals		71	\$85,000	241	61	\$75,000	25.3
2004 Totals		67	\$67,500	186	58	\$58,500	31.2
2003 Totals		27	\$26,100	92	31	\$30,100	33.7

*Source of Funding:

A= Annual Donation; E=Endowment;

O=Other, eg. Faculty funds;

S=Senate Scholarship Fund

**Amount student receives
in Year One only.

2005/06 Entrance Scholarship Summary

Name & Total Value of Award	* Source of Funding	# of awards available	**Total money available	# of awards offered	# of awards accepted	** Total money spent	% of Offers Accepted
Faculty of Mathematics							
CIBC National Scholarship - \$25,000/4yrs	A	1	\$6,250	1	1	\$6,250	
Microsoft National Scholarship - \$25,000/4yrs	A	1	\$6,250	1	1	\$6,250	
SAS National Scholarship - \$25,000/4yrs	A	1	\$6,250	1	1	\$6,250	
Towers Perrin National Scholarship - \$25,000/4yrs	A	1	\$6,250	2	1	\$6,250	
K.D. Fryer National Scholarship - \$18,000/4yrs	E	1	\$4,500	1	1	\$4,500	
Great West/London/Canada Life National - \$18,000/4yrs	A	2	\$9,000	3	2	\$9,000	
E. Anderson National Scholarship - \$18,000/4yrs	E	1	\$4,500	1	1	\$4,500	
J.W. Graham National Scholarship - \$18,000/4yrs	E	1	\$4,500	1	1	\$4,500	
Manulife Financial National Schol - \$18,000/4yrs	A	1	\$4,500	1	1	\$4,500	
R.G. Dunkley National Scholarship - \$18,000/4yrs	E	1	\$4,500	1	1	\$4,500	
R.G. Scoins National Scholarship - \$18,000/4yrs	E	1	\$4,500	1	1	\$4,500	
R.G. Stanton National Scholarship - \$18,000/4yrs	E	1	\$4,500	1	1	\$4,500	
W.T. Tutte National Scholarship - \$18,000/4yrs	E	1	\$4,500	1	1	\$4,500	
J.G. Kalbfleisch National Scholarship - \$14,000/4yrs	E	1	\$3,500	1	1	\$3,500	
J.D. Kalbfleisch International Scholarship - \$10,000/4yrs	E	1	\$4,000	1	1	\$4,000	
Rene Descartes Scholarship - \$8,000/4yrs	O	15	\$30,000	30	12	\$24,000	
Rene Descartes Scholarship - \$5,000/4yrs	O	25	\$50,000	68	22	\$44,000	
Marsh Memorial Scholarship - \$4,000	A	1	\$4,000	1	1	\$4,000	
R & E Madter Entrance Scholarship - \$3,500	E	1	\$3,500	2	1	\$3,500	
Merrill Lynch Scholarship - \$2,500	E	1	\$2,500	1	1	\$2,500	
Rene Descartes Scholarship - \$2,000	O	100	\$200,000	205	92	\$184,000	
Computational Mathematics Scholarship - \$2,000	O	4	\$8,000	16	4	\$8,000	
Faculty of Mathematics Alumni Scholarship - \$2,000	A	3	\$6,000	3	3	\$6,000	
President's Scholarship - \$2,000 (unlimited)	O	258	\$516,000	780	258	\$516,000	
UW Alumni@Microsoft Mathematics Scholarship - \$2,000	E	2	\$8,000	2	2	\$8,000	
Art Headlam Entrance Scholarship - \$2,000	E	2	\$4,000	4	2	\$4,000	
Friar Luca Pacioli Entrance Scholarship - \$1,000	E	1	\$1,000	1	1	\$1,000	
John Matthew Scholarship - \$1,000	A	1	\$1,000	0	0	\$0	
2005 Totals		430	\$911,500	1,131	415	\$882,500	36.7
2004 Totals		174	\$692,000	563	211	\$840,250	37.5
2003 Totals		112	\$358,500	217	87	\$289,500	40.1
Faculty of Science							
A. Donald Maynes Entrance Scholarship - \$2,500	E	1	\$2,500	1	1	\$2,500	
President's Scholarship - \$2,000 (unlimited)	O	125	\$250,000	860	125	\$250,000	
Canadian General Tower Scholarship - \$1,500	E	1	\$1,500	2	1	\$1,500	
Earth Sciences Entrance Scholarship - \$1,500-\$7,500	S	2	\$4,000	10	1	\$2,000	
Arebi Family Entrance Scholarship - \$1,000	E	1	\$1,000	2	1	\$1,000	
Fed. of Chinese Cnd Professionals Fdtn Schol - \$1,000	A	1	\$1,000	1	1	\$1,000	
2005 Totals		131	\$260,000	876	130	\$258,000	14.8
2004 Totals		117	\$127,000	849	117	\$127,000	13.8
2003 Totals		53	\$72,500	459	51	\$70,500	11.1

*Source of Funding:

A= Annual Donation; E=Endowment;

O=Other, eg. Faculty funds;

S=Senate Scholarship Fund

**Amount student receives
in Year One only.

2005/06 Entrance Scholarship Summary

Name & Total Value of Award	* Source of Funding	# of awards available	**Total money available	# of awards offered	# of awards accepted	** Total money spent	% of Offers Accepted
Software Engineering							
Scotiabank Software Eng Ent Schol - \$20,000/4yrs	E	1	\$5,000	1	1	\$5,000	
Software Engineering Entrance Scholarship - \$5,000	O	5	\$25,000	9	5	\$25,000	
President's Scholarship - \$2,000 (unlimited)	O	38	\$76,000	72	38	\$76,000	
Sony of Canada Scholarship - \$1,500	A	1	\$1,500	2	1	\$1,500	
2005 Totals		45	\$107,500	84	45	\$107,500	53.6
2004 Totals		22	\$61,500	39	22	\$61,500	56.4
2003 Totals		17	\$59,000	25	17	\$59,000	68.0
Any Faculty							
UW/Canadian Merit Schol Foundation - \$24,000/4yrs	O	4	\$24,000	4	0	\$0	
J.H. Lang Entrance Scholarship - \$5,000/2yrs	E	1	\$3,000	1	1	\$3,000	
UW Alumni Scholarship - \$5,000/4yrs	E	3	\$6,000	5	2	\$4,000	
Waterloo County Entrance Scholarship- \$4,000/2yrs	S/E/O	40	\$120,000	58	40	\$120,000	
Dixon Waterloo Region Entrance Schol - \$2,500	E	2	\$5,000	2	2	\$5,000	
Magnum Centennial Entrance Scholarship - \$2,000	E	1	\$2,000	2	1	\$2,000	
UW Alumni@Microsoft Entrance Scholarship - \$2,000	E	1	\$2,000	3	1	\$2,000	
Hong Kong Alumni Entrance Scholarship - \$1,200	E	1	\$1,200	2	1	\$1,200	
Sullivan Entrance Scholarship - \$1,000	A	1	\$1,000	1	1	\$1,000	
UW Retirees' Entrance Scholarship - \$1,000	E	2	\$2,000	3	2	\$2,000	
2005 Totals		56	\$166,200	81	51	\$140,200	63.0
2004 Totals		61	\$194,900	102	61	\$194,900	59.8
2003 Totals		47	\$136,600	85	47	\$136,600	55.3
2005 Overall Totals		1653	\$3,172,200	5,573	1,564	\$2,987,200	28.1
2004 Overall Totals		1351	\$2,356,400	5,085	1,476	\$2,478,650	29.0
2003 Overall Totals		643	\$1,261,700	3,369	601	\$1,149,700	17.8

*Source of Funding:
A= Annual Donation; E=Endowment;
O=Other, eg. Faculty funds;
S=Senate Scholarship Fund

**Amount student receives
in Year One only.

Entrance Bursary Breakdown by Faculty 2005

Attachment #2

	2004 1B installments Spring 2005		Fall 2005 Entrance Bursaries					
AHS	0	\$ -	45	\$ 144,500.00				
Arts	1	\$ 2,000.00	214	\$ 633,500.00				
Eng	102	\$ 192,000.00	234	\$ 791,500.00				
Env St	0	\$ -	30	\$ 104,000.00				
Ind St	0	\$ -	1	\$ 2,000.00				
Math	21	\$ 42,000.00	130	\$ 401,000.00				
Sci	1	\$ 2,000.00	111	\$ 273,000.00				
Soft Eng	0	\$ -	17	\$ 62,000.00				
Total	125	\$ 238,000.00	782	\$ 2,411,500.00				
<p>Note: In addition to the above Entrance Bursaries, a total of 176 President's Scholarships valued at \$352,000 were also charged to the Tuition Set- Aside Funds. These 176 students were identified as being in financial need and having admission averages of 90% or above.</p>								

Local Aid Funds 2005/06 Projected Spending and To Date Spending			
<i>for information only</i>			
	Budget to be confirmed by IAP		
Projected Total Local Aid Funds Available	\$ 11,375,000.00		
Projected Graduate Allocation	\$ 1,138,000.00		
Projected Undergraduate Allocation	\$ 10,237,000.00		
	Projected Spending	# of Schol/Burs	To Date Spending
UG Entrance Scholarships (President's Scholarships)	\$ 356,000.00	176	\$ 352,000.00
UG Entrance Bursaries	\$ 2,889,000.00	782	\$ 2,649,500.00
UG Bursaries (system assigned)	\$ 3,720,954.00	1873	\$ 1,713,890.00
UG Bursaries (application)	Unknown	727	\$ 1,222,515.00
UG Bursaries (application)			
Out of Province Students	\$ 725,000.00	57	\$ 152,400.00
Part time Students	\$ 40,000.00	28	\$ 21,990.00
UW Work Placement	\$ 1,621,200.00	68	\$ 532,167.00
Total	\$ 9,352,154.00		\$ 6,644,462.00
Note: the to date figures do not include the Winter term bursaries			

UNIVERSITY OF WATERLOO
SENATE UNDERGRADUATE COUNCIL
Report to Senate – January 16, 2005

Senate Undergraduate Council met on December 6, 2005 and agreed to forward the following items to Senate for approval and information, as indicated below [*further details may be obtained from the Secretary, ext. 5924*].

FOR APPROVAL

NEW PLANS [*effective September 2006*]

Faculty of Mathematics

Bachelor of Science (Honours Bioinformatics), Regular; Bachelor of Science (Honours Biology & Bioinformatics), Regular; Bachelor of Computer Science (Honours Bioinformatics Option), Regular

The Faculty would like to offer the Bioinformatics plans on a regular basis to assist existing students who encounter co-op difficulties, as well as to allow the Faculty to admit more international students. With the exception of co-op requirements, the requirements for the regular plan are identical to those required for the co-op plan. Course sequencing of the regular plans will follow those of the co-op plans (i.e., regular students will not follow a “traditional” term sequence).

The requirements are as follows:

In conjunction with common degree requirements in Table I, 'Degree Requirements' on page 11.5, this plan requires at least 20 units and 0.50 lab units. To continue in any Bioinformatics plan, a student must satisfy the cumulative overall average requirement and cumulative major average requirement for Computer Science of 60%, as specified by the Faculty of Mathematics, and the cumulative major average requirement for Biology of 60%, as specified by the Faculty of Science.

One of

- CS 125 Introduction to Programming Principles
- CS 133 Developing Programming Principles
- CS 135 Designing Functional Programs
- A 300- or 400-level CS major course in addition to those required below

One of

- CS 134 Principles of Computer Science
- CS 136 Elementary Algorithm Design and Data Abstraction

All of

- MATH 135 (or MATH 145) Algebra
- MATH 136 (or MATH 146) Linear Algebra 1
- MATH 137 (or MATH 147) Calculus 1
- MATH 138 (or MATH 148) Calculus 2
- MATH 239 (or MATH 249) Introduction to Combinatorics
- STAT 230 (or STAT 240) Probability
- STAT 231 (or STAT 241) Statistics
- BIOL 130 Introductory Cell Biology
- BIOL 139 Genetics
- BIOL 140 Fundamentals of Microbiology
- BIOL 265 Diversity of Life
- BIOL 330 Molecular Biology
- BIOL 331 Advanced Cell Biology
- BIOL 342 Molecular Biotechnology 1
- BIOL 365 Resources in Bioinformatics
- BIOL 465 Current Topics in Bioinformatics

CHEM 120 Physical and Chemical Properties of Matter
CHEM 120L Chemical Reaction Laboratory 1
CHEM 123 Chemical Reactions, Equilibria and Kinetics
CHEM 123L Chemical Reactions Laboratory 2
CHEM 264 Organic Chemistry 1 or CHEM 28 Introductory Organic Chemistry: Environmental
CS 240 Data Structures and Data Management
CS 241 Foundations of Sequential Programs
CS 245 Logic and Computation
CS 246 Software Abstraction and Specification
CS 251 Computer Organization and Design
CS 341 Algorithms
CS 482 Computational Techniques in Biological Sequence Analysis
CS 483 Computational Techniques in Structural Bioinformatics

Recommended courses

CHEM 333 Metabolism 1 (for students interested in Biochemistry)
BIOL 432 Molecular Biotechnology 2

Note: A student can qualify for at most one of the following three degrees, regardless of which courses are taken.

Bachelor of Science (Honours Bioinformatics)

This plan requires fulfillment of the core requirements as listed above in Bioinformatics plus the following courses:

All of

BIOL 434 Human Molecular Genetics or a fourth-year Biochemistry course
CHEM 237 Introductory Biochemistry
CS 350 Operating Systems

Bachelor of Science (Honours Biology and Bioinformatics)

This plan requires fulfillment of the core requirements as listed above in Bioinformatics plus the following courses:

All of

BIOL 434 Human Molecular Genetics
CHEM 237 Introductory Biochemistry

Three additional third- or fourth-year Biology or Biochemistry courses.

Bachelor of Computer Science (Honours Bioinformatics Option)

This plan requires fulfillment of the core requirements as listed above in Bioinformatics plus the following courses:

All of

CS 350 Operating Systems

Two additional courses from CS 340-398, 440-498.

One additional course from CS 440-498 that is not from the Applications area.

Recommended courses

CS 448 Introduction to Database Management
CS 486 Introduction to Artificial Intelligence

Notes

1. Students in Bioinformatics may not claim a Biology minor with a BCS degree;
2. Students in Bioinformatics may not claim a Computer Science minor with a BSc degree.

MODIFICATIONS TO EXISTING PLANS *[effective September 2007]*

Faculty of Mathematics

Bachelor of Science (Honours Bioinformatics), Co-op; Bachelor of Science (Honours Biology & Bioinformatics), Co-op; Bachelor of Computer Science (Honours Bioinformatics Option), Co-op

The Faculty recommends converting these plans to a stream-8 co-op sequence from a stream-4 co-op sequence to allow students to complete the 1B term before being required to go on work term (currently, the first work term occurs after 1A). This will also allow students to participate in a work term after the 4A term which will enable them to exercise the skills learned in BIOL 465 and CS 482, taken in 4A.

PLAN NAME CHANGES *[effective September 2006]*

Faculty of Science

Earth Sciences, Environmental Hydrogeology Specialization and Geography Specialization

The Faculty proposes to revise the names of these plans to be consistent with the naming conventions used by other plans in the Faculty of Science. The Environmental Hydrogeology Specialization will be renamed Hydrogeology Specialization and the Geography Specialization will be renamed Environmental Specialization. *Re* the Environmental Specialization, the course content has been modified so that its requirements meet the Association of Professional Geoscientists of Ontario (APGO) requirements for professional licensure.

INACTIVATED PLANS *[effective September 2007]*

Faculty of Science

Honours Science – Earth Sciences Specialization

The enrolment in this plan is very low and the number of Earth Sciences credits included in the plan fall well below those required for a professional license.

CHANGE IN DEGREE REQUIREMENTS AND REGULATIONS

Faculty of Mathematics

Honours Bachelor of Mathematics, Regular *[effective September 2006]*

The Faculty proposes to change the full-time term requirement for the Honours Regular degree from eight full-time terms to seven. The full-time term requirement for the Co-op degree remains the same.

Reducing the number of required full-time terms for regular students will give “strong” students, many of who will go on to graduate school, added flexibility. The current full-time term requirement does not allow for graduation ahead of schedule, which may be necessary to suit the academic cycle of a graduate program.

Maximum Course Load

Honours Bachelor of Mathematics, Regular and Co-op *[effective September 2007]*

The standard course load for Mathematics students is five courses per term (2.5 units). While students who are in academic difficulty are frequently advised to reduce their course load in order to recover, many insist on moving at full speed toward graduation, which often results in them not graduating at all. The change in regulation will require students in serious difficulty to reduce their course load for the next term.

The current Course Load Policy noted in the Undergraduate Calendar will be deleted and replaced with the following:

“The standard course load for students in the Mathematics Faculty is five courses per term (2.5 units). The maximum load that may be taken without special permission is 2.75 units, allowing for five 0.5-unit courses and one 0.25-unit course. Exceptions to this normal load are as follows:

- Students who have a cumulative average of 80% or more may request permission from their advisor to enrol in a sixth course. The intention is to permit students to take additional courses beyond the 40 course (20 unit) degree requirement and thereby gain greater breadth in their education. Honours Co-op students should not enrol in six courses with a view to graduating in fewer than eight terms, since it is Faculty regulation that Co-op students must complete eight full-time terms in order to graduate with an Honours degree.
- If a student has courses with INC grades on her/his record, the total unit weight of those INC courses and the courses enrolled for the current term may not normally exceed 3.25 units. A student may obtain permission from an academic advisor to exceed this limit, if an INC will not be completed in the current term because the course is not offered.
- 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.

If more than one of the preceding apply to a student, the maximum course load is the smallest of the limit specified.”

MODIFICATIONS TO THE EXAMINATION REGULATIONS AND RELATED MATTERS

[Effective September 2006]

Examination regulations currently stipulate that “No assignments are to be due after the formal lecture period for those courses with final examinations.” Course instructors with no final examinations could require that an assignment be due during the pre-examination study days. Undergraduate Council recommends the following amendment (**in bold**) to ensure that this does not occur:

“It is important to ensure that the student has equitable opportunity to prepare for the final assessment of all courses taken during the term. Normally the period of the term scheduled for final examinations is reserved for preparation and sitting, for the final examination or an alternative assignment with equivalent time commitments for those courses without final examinations. No assignments are to be due after the formal lecture period for those courses with final examinations. **For courses with no final examination, no assignments are to be due during the period between the end of lectures and the beginning of examinations.**”

The regulations do not specify a time limit related to “Student Access to Final Examination Papers” as stated in the Calendar under "Retention of Examination Answer Papers". Council recommends the following amendments (**in bold and ~~strikeout~~**):

“The instructor may informally review the final examination paper under supervised access to read only with a student who requests it, ~~but not before the official release of grades and standings in Quest.~~ **up to one year from the date that the examination was written.** Although not mandatory, instructors are encouraged to follow this practice. Where such an informal review process cannot be arranged, the following procedure is available to any student who wishes to obtain access to his/her final examination papers **within one year from the dates that the examinations were written:....**”

MODIFICATIONS TO ACADEMIC REGULATIONS AND REQUIREMENTS [effective
September 2006]

Earlier this year, Council discussed the adequacy of the Undergraduate Calendar statement describing how regulations apply based on the timing of entry to or selection of a major. Based on a recommendation from the Undergraduate Operations Committee, Council submits the following revised statement:

The current statement reads:

“Academic regulations and requirements listed in this Calendar apply to those students commencing their studies in their chosen plan in September 2005. Students are governed by the academic regulations in place for their academic plan at the time they commence studies in that plan through to graduation or until withdrawal. When degree requirements change, the student can elect those requirements in place at the time of entry or at the term of graduation, unless the Faculty specifies otherwise when the change is introduced.”

The revised statement reads:

“Academic regulations and requirements listed in this Calendar apply to those students commencing their studies in their chosen plan in September 2006, January 2007 or May 2007. Students are normally governed by the regulations current for their academic plan at the time they commence studies in that plan, except when plan selection is required only after a specified period of registration. Students who select a plan within the time limits specified by the Faculty will be governed by the regulations current in the term in which they entered the Faculty.

When degree requirements change, a student may continue to be governed by the set of regulations as specified in the preceding paragraph or can elect to be governed by the new set of regulations, unless the Faculty specifies otherwise when the change is introduced.”

FOR INFORMATION

Curricular Modifications

On behalf of Senate, Council approved several changes to academic plans, new courses, course changes and course inactivations for the Faculties of Arts (Church Music & Worship [Conrad Grebel College], Classical Studies, Dean of Arts, Economics, Music, Religious Studies, Sociology & Legal Studies), Engineering (Mechanical Engineering, Systems Design); Engineering (Architecture, Environmental Engineering, Mechanical Engineering, Mechatronics, Option in Water Resources, Systems Design Engineering, Complementary Studies Elective List); Environmental Studies (Environmental Studies Minor, Environment & Resource Studies, Geography, Planning, Sustainable Local Economic Development), Mathematics (Applied Mathematics, Computer Science, Honours Bioinformatics, Honours Biology & Bioinformatics, No Credit List, Software Engineering Option, Statistics); and Science (Biochemistry, Biology, Chemistry, Computational Science/Physics, Earth Sciences, Mathematical Physics, Physics, Science & Business/Biochemistry, Science & Business/Physics).