

Senate
Senate Chamber
Room E3-262 Engineering Building
WEDNESDAY, December 3, 2008
1:30 p.m.
Regrets call 474-6892

A G E N D A

I MATTERS TO BE CONSIDERED IN CLOSED SESSION

1. Report of the Senate Committee on Honorary Degrees

II MATTERS RECOMMENDED FOR CONCURRENCE WITHOUT DEBATE

1. Report of the Senate Committee on Curriculum and Course Changes – Part A Page 17

2. Proposed Academic Schedule for 2009-2010 Page 93

III MATTERS FORWARDED FOR INFORMATION

1. Report of the Senate Committee on Awards Page 98
2. Correspondence from SCUR regarding Establishment of the University of Manitoba Military & Veteran Health Sciences Research Group Page 107

IV REPORT OF THE PRESIDENT

V QUESTION PERIOD

Senators are reminded that questions shall normally be submitted in writing to the University Secretary no later than 10:00 a.m. of the day preceding the meeting.

VI CONSIDERATION OF THE MINUTES OF THE MEETING OF NOVEMBER 5, 2008

VII BUSINESS ARISING FROM THE MINUTES

VIII REPORTS OF THE SENATE EXECUTIVE COMMITTEE AND THE SENATE PLANNING AND PRIORITIES COMMITTEE

1. Report of the Senate Executive Committee Page 122

Comments of the Senate Executive Committee will accompany the report on which they are made.

2. **Report of the Senate
Planning and Priorities Committee**

The Chair will make an oral report on the Committee's activities.

**IX REPORTS OF OTHER COMMITTEES OF SENATE,
FACULTY AND SCHOOL COUNCILS**

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|----|---|----------|
| 1. | Report of the Senate Committee on Curriculum and Course Changes [dated April 9, 2008]
RE: Process for Deletion of Lapsed Courses
and Elimination of "Not Currently Offered" Category | Page 123 |
| 2. | Correspondence from Dr. Robert Kerr, Vice-President (Academic) and Provost RE: Institutional Expectations for Undergraduate Programs | Page 125 |
| a) | Report of the Senate Committee on Course and Curriculum Changes | Page 135 |
| b) | Report of the Senate Planning & Priorities Committee | Page 137 |
| 3. | Proposal for a Post-Baccalaureate Diploma for the Internationally-Education Engineers Qualification Program (IEEQ) in the Faculty of Engineering | Page 139 |
| a) | Report of the Senate Planning & Priorities Committee | Page 185 |
| 4. | Undergraduate Changes with Resource Implications or Course Changes Beyond Nine Credit Hours – Department of Mechanical and Manufacturing Engineering | |
| a) | Report of the Senate Committee on Curriculum and Course Changes | Page 187 |
| b) | Report of the Senate Planning and Priorities Committee | Page 202 |
| 5. | Report of the Senate Committee on Animal Care RE: Revised Policy and Procedures on Animal Care and Use | Page 203 |

X ADDITIONAL BUSINESS

- | | | |
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| 1. | <u>Chairs and Professorships Policy and Procedures</u> | Page 220 |
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XI ADJOURNMENT

Please call regrets to 474-6892 or meg_brolley@umanitoba.ca

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Report of the Senate Committee on Curriculum and Course Changes – Part A - Submitted to Senate for Concurrence Without Debate

Preamble

1. The terms of reference for the Senate Committee on Curriculum and Course Changes (SCCCC) are found on the website at:
http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/497.htm. SCCCC is "to recommend to Senate on the introduction, modification or abolition of undergraduate programs, curricula or courses".
2. Since last reporting to Senate, the Senate Committee on Curriculum and Course Changes (SCCCC) met on October 15, 20 and November 4, 2008, to consider curriculum and course changes from Faculties and Schools.

Observations

1. **General**

In keeping with past practice, most changes for departments totaling less than ten credit hours are forwarded to Senate for concurrence without debate. This is in accordance with the Senate's recommendation approved July 3, 1973, that course changes would cease to go to the SPPC when the resource implications are intra-faculty. Deans and Directors are to assess the resource implications to the respective units when course changes are proposed. Major changes in existing programs are to be referred to the SPPC for assessment of resource implications.

2. Consistent with the new affiliation agreement between the University and Collège universitaire de Saint-Boniface, curriculum and course changes from the Collège were submitted directly by the Collège to this committee.
3. The Committee noted that a number of departments are planning to teach fourth year honours courses and graduate level courses simultaneously using different methods of evaluation.
4. The Committee noted that the History Department is proposing the introduction of a 6 credit hour course *plus* two 3 credit hour courses which cover the same material. While there is no policy in place prohibiting this, the Committee indicated that, in future, these types of introductions would not be approved due to the possible impact on students and the confusion inherent in such arrangements.

5. **Faculty of Agricultural & Food Sciences**

Animal Science

The Department is proposing the introduction of one course: **ANSC 4240 Mathematical Modeling of Biological Systems (3)** which will be added to the restricted electives in the Animal Systems Program.

Plant Science

The Department is proposing the introduction of one course **PLNT 4610 Bioinformatics (3)**.

Soil Science

The Department is proposing the introduction of one course **SOIL 3610 Field Methods in Land Resource Science (3)** which will be added to the restricted electives in the Agroecology Degree, and will also be added as an option in the Soil Science minor.

Food Science

The Department is proposing the deletion of three courses: **FOOD 4300 Food Toxicants (3)**, **FOOD 4280 Food Microbiology 2 (3)**, and **FOOD 4520 The Packaging of Food (3)**.

6. Faculty of Arts

Anthropology

The Department is proposing the deletion of one course: **ANTH 3390 Methods in Ethnology (B)(3)**, the introduction of one course: **ANTH 3930 Ethnographic Research Methods (B) (3)**, and the modification of one course: **ANTH 3750 Anthropological Perspectives on Globalization and the World-System (B) (3)**. In the Advanced Major Program, for the optional courses in Year 3, ANTH 3390 is being replaced by ANTH 3930.

Asian Studies

The Program is proposing the deletion of one course: **ASIA 2070 South Asian Civilization (6)**, the introduction of one course: **ASIA 2080 South Asian Civilization (3)**, and the modification of one course: **ASIA 2760 Intermediate Chinese (Mandarin) (6)**. In addition, the Department is proposing course changes in the General Major Program, the Minor Program, and in List A including the deletion of HIST 1410 and, the General Major Program, the deletion of ASIA 2070 and addition of ASIA 2080 to the list of optional courses.

Canadian Studies

The list of approved courses in Canadian Studies will be modified to reflect course deletions and introductions in other departments.

Central and East European Studies

It is proposed that "List A" be deleted and deletions and additions be made to "List B" which will be renamed "List of Approved Courses in Central and East European Studies". Subsequent changes to the General Major, Advanced Major, Minor and Honours Double Programs will reflect this. Also, there will be the addition of a footnote to the Minor Program.

Economics

The Department is proposing the modification of one course: **ECON 4140 Evaluation of Economic Policy and Programs (3)**. Program changes to the Economics Honours Single

and Honours Double remove STAT 1000 and STAT 2000 as optional courses. Footnote changes will be made to the Program Notes for the following programs: Economics, Economics-Mathematics Joint Honours, and the Economics-Statistics Joint Honours.

English, Film, and Theatre – English

The Department is proposing the modification of one course: **ENGL 3530 Special Topics in Creative Writing 1 (3)**. The Department proposes changes to the Honours Single program and the English course descriptions, B-Introductory course information.

German and Slavic Studies – German

The Department is proposing the introduction of three courses: **GRMN 1300 Masterpieces of German Literature in English Translation (3)**, **GRMN 3262 Representations of the Holocaust in English Translation (3)** and **GRMN 3282 Sex, Gender and Cultural Politics in the German-Speaking World in English Translation (3)**; and the modification of three courses: **GRMN 3260 Representations of the Holocaust (3)**, and **GRMN 3280 Sex, Gender and Cultural Politics in the German-Speaking World (3)**.

Polish

Modification to the Polish Minor with POL 2530 and POL 2690 being added to the list of optional courses in Year 3.

Russian

The Department is proposing the deletion of one course: **RUSN 2770 Masterpieces of Russian Literature in Translation (3)** and the introduction of one course: **RUSN 1400 Masterpieces of Russian Literature in Translation (3)**. In addition, RUSN 1400 will be added and RUSN 2770 deleted from the listing of literature courses in the Russian Program Notes.

Global Political Economy

It is proposed that SOC 3470 Political Sociology be replaced by SOC 3380 Power, Politics and the Welfare State in the General Major and Advanced Major and that the list of suggested electives is being revised to add: ASIA 2080 and SOC 3380 and to flag ASIA 2070 and SOC 3470 as no longer offered.

History

The Department is proposing the deletion of six courses: **HIST 1410 Asian Civilizations (B) (6)**, **HIST 2690 The Common People in Industrial Society (G) (6)**, **HIST 3060 German and German Jewish History 1780-1933 (E) (3)**, **HIST 3930 Minorities in the Modern World (M) (3)**, **HIST 3960 China, 1911 to the Present (B) (3)**, and **HIST 4940 Revolutionary China: A Century of Upheaval, 1870 to the Present (B)(6)**; the introduction of seven courses: **HIST 2654 History of the People's Republic of China, 1949-Present (B) (3)**, **HIST 2750 History of the United States from 1607 to 1877 (A) (3)**, **HIST 3062 German and German-Jewish History, 1618 to the Present (E) (6)**, **HIST 3064 German and German-Jewish History, 1618-1900 (E) (3)**, **HIST 3066 German and German-Jewish History, 1900 to the Present**

(E) (3), HIST 4680 Social History of Health and Disease in Modern Canada (C) (6), and HIST 4660 History of Health and Disease (G) (6); and the modification of three courses: HIST 1420 Asian Civilizations to 1500 (B) (3), HIST 1430 Asian Civilizations from 1500 (B) (3), and HIST 2230 History of the United States from 1607 (A) (6).

Labour Studies

The Program is proposing the introduction of one course: **LABR 3080 Labour and Community Organizing (3)** and a modification to the list of electives to add SOC 3380 and mark HIST 2690 and SOC 3470 as no longer offered.

Native Studies

The Department is proposing the modification of three courses: **NATV 2020 The Métis of Canada (3)**, **NATV 2220 Native Societies and the Political Process (3)**, and **NATV 3240 Native Medicine and Health (3)**.

Political Studies

The Department is proposing the deletion of one course: **POLS 3610 Political Metaphors (3)**; and the introduction of three courses: **POLS 3710 Distributive Justice (3)**, **POLS 4710 Political Theory and the Family (3)**, and **POLS 4140 Canadian Political Ideas (3)**. The Program Notes will be modified to add POLS 3710 and POLS 4710 and to delete POLS 3610 to footnote 1.

Psychology

The Department is proposing the introduction of one course: **PSYC 3130 Introduction to Health Psychology (3)**.

Sociology

The Department is proposing the deletion of two courses: **SOC 3760 Criminology Field Experience (6)** and **SOC 3470 Political Sociology (3)**; the introduction of three courses: **SOC 3860 Genocide, Crime and Society (3)**, **SOC 3100 Practicum in Criminological/Sociological Research (6)**, and **SOC 3380 Power, Politics and the Welfare State (3)**; and the modification of four courses: **SOC 3330 Origins of Sociological Thought (3)**, **SOC 3350 Feminism and Sociological Theory (3)**, **SOC 3360 Theories in Social Psychology (3)**, and **SOC 3390 Contemporary Sociological Theory (3)**. In the General Major Sociology, General Major Criminology, Advanced Major Sociology, Honours Single and Honours Double Programs the requirement of SOC 3760 will be replaced by SOC 3100 and the requirement for SOC 3470 will be replaced by SOC 3380.

Women's and Gender Studies

The Program is proposing the addition of two courses to List A: GRMN 3282 and NATV 2430.

History of Art

The Program is proposing the addition of **FAAH 3202 Contemporary Art History (3)** to List B.

Mathematics

Faculty of Arts students are able to take an advanced or general major or a minor in Mathematics. Two courses MATH 1530 and MATH 1730 have been removed from the program chart and MATH 2552 replaces MATH 2550 in the program chart.

Minor Programs Offered by Other Faculties and Schools

The Faculty will allow an Arts student to declare a minor offered by other Faculties and Schools providing the minor consists of a minimum of 18 credit hours.

7. Faculty of Engineering

The Faculty is proposing the introduction of one course: **ENG 1900 Occupational Health and Safety Awareness (3)**.

Biosystems Engineering

The Department is proposing the introduction of one course: **BIOE 3200 Environmental Engineering for Non-Engineers (3)** and a program modification to reduce the requirement for graduation from 48 to 45 courses.

Civil Engineering

The Department is proposing one course modification: **CIVL 2840 Civil Engineering Geomatics (3)** to update the prerequisites.

Electrical and Computer Engineering

The Department is proposing the deletion of five courses: **ECE 2130 Electric Fields (4)**, **ECE 4750 Contemporary Topics in Electrical Engineering 1 (4)**, **ECE 4760 Contemporary Topics in Electrical Engineering 2 (3)**, **ECE 4770 Contemporary Topics in Electrical Engineering 3 (4)**, and **ECE 4780 Contemporary Topics in Electrical Engineering 1 (3)**; and the introduction of two courses: **ECE 2240 Numerical Methods for Electrical Engineers (4)** and **ECE 3580 Foundations of Electromagnetics (4)**.

8. Clayton H. Riddell Faculty of Environment, Earth, and Resources

The Faculty is proposing the introduction of one course **EER 1000 Earth: A User's Guide (3)**.

9. Faculty of Human Ecology

Human Nutritional Sciences

The Faculty is proposing the introduction on one course **HNSC 4600 Practice-based Research in Human Nutritional Sciences (3)**; the modification of one course: **HNSC 4140 Quantity Food Production and Management (3)**; and a modification to the degree requirements for students in the Nutrition Option and in the Food Industry Option of Human Nutritional Sciences.

10. **Faculty of Kinesiology and Recreation Management**

The Faculty is proposing the introduction of an external minor in Recreation Studies consisting of 12 credit hours of required courses and 6 credit hours from a list of elective courses.

11. **Faculty of Nursing**

The Faculty is proposing a modification to the degree requirements for students admitted prior to September 2006 to allow these students to take course: NURS 4310 Leadership and Issues in Nursing (from the new curriculum) in place of NURS 4170 Issues and Trends in Nursing plus NURS 4190 Leadership in Nursing (from the old curriculum). In addition, there is a proposal to modify a course guideline in the General Calendar.

12. **Faculty of Science**

Biotechnology Program

The Program is proposing the introduction of five new courses: **BTEC 4000 Research Project in Biotechnology (6)**, **BTEC 3980 Work Term 1 (0)**, **BTEC 3990 Work Term 2 (0)**, **BTEC 4980 Work Term 3 (0)**, and **BTEC 4990 Work Term 4 (0)**; and a modification to the Honours Degree program. In addition, a proposal for a Major Degree program in Biotechnology is currently under development.

Chemistry

The Department is proposing the modification of two courses: **CHEM 4640 Spectroscopy, Relaxation, and Structure (3)** and **CHEM 4680 Organometallic Chemistry (3)**. The Department is proposing a change to the entry requirements for the B.Sc. Honours and B.Sc. Major degree programs.

Computer Science

The Department is proposing the deletion of one course: **COMP 4270 Design Theory and Coding Theory (3)**; the addition of two courses: **COMP 3820 Introduction to Bioinformatics Algorithms (3)** and **COMP 4180 Intelligent Mobile Robotics (3)**; and the modification of nine courses: **COMP 2130 Discrete Mathematics for Computer Science (3)**, **COMP 2280 Introduction to Computer Systems (3)**, **COMP 3090 Digital Logic 2 (3)**, **COMP 3290 Introduction to Compiler Construction (3)**, **COMP 3370 Computer Organization (3)**, **COMP 3430 Operating Systems (3)**, **COMP 3720 Computer Networks 1 (3)**, **COMP 4510 Introduction to Parallel Computation (3)**, and **COMP 4550 Real-Time Systems (3)**. The Department proposes the modification of a further three courses to remove MATH 1530 or MATH 1730 from the course descriptions: **COMP 2130 Discrete Mathematics for Computer Science (3)**, **COMP 2190 Introduction to Scientific Computing (3)**, and **COMP 4530 Introduction to Simulation and Model Building (3)**.

Mathematics

The Department is proposing the deletion of six courses: **MATH 1530 Calculus with Computers (3)**, **MATH 1680 Mathematics for Agriculture and Related Sciences (6)**, **MATH 1730 Calculus 2 with Computers (3)**, **MATH 2550 Modern Geometry (6)**, **MATH 3510 Mathematical Theory of Operational Research (3)**, and **MATH 3520 Mathematical**

Elements for Computational Graphics (3); the addition of one course: MATH 2552 Geometry of the Plane (6); and the modification of 37 courses MATH 1010 Applied Finite Mathematics (3), MATH 1020 Mathematics in Art (3), MATH 1190 Topics in Mathematics (6), MATH 1200 Elements of Discrete Mathematics (3), MATH 1210 Techniques of Classical and Linear Algebra (3), MATH 1300 Vector Geometry and Linear Algebra (3), MATH 1310 Matrices for Management and Social Sciences (3), MATH 1500 Introduction to Calculus (3), MATH 1510 Applied Calculus (3), MATH 1520 Introductory Calculus for Management and Social Sciences (3), MATH 1690 Calculus (6), MATH 1700 Calculus 2 (3), MATH 1710 Applied Calculus 2 (3), MATH 2130 Engineering Mathematical Analysis 1 (3), MATH 2132 Engineering Mathematical Analysis 2 (3), MATH 2300 Linear Algebra 2 (3), MATH 2352 Advanced Linear Algebra (6), MATH 2450 Combinatorial Mathematics (6), MATH 2600 Numerical Mathematics 1 (3), MATH 2720 Multivariable Calculus (3), MATH 2730 Sequences and Series (3), MATH 2750 Intermediate Calculus (6), MATH 2800 Ordinary Differential Equations with Applications 1 (3), MATH 3120 Applied Discrete Mathematics (3), MATH 3130 Linear Spaces for Physicists (3), MATH 3132 Engineering Mathematical Analysis 3 (3), MATH 3142 Engineering Mathematical Analysis 4 (3), MATH 3210 Topology (3), MATH 3530 Mathematical Problems in the Biological Sciences (3), MATH 3600 Numerical Mathematics 2 (3), MATH 3700 Applied Complex Analysis (3), MATH 3710 Complex Analysis 1 (3), MATH 3760 Advanced Calculus (6), MATH 3800 Ordinary Differential Equations with Applications 2 (3), MATH 4310 Applied Matrix Analysis (3), MATH 4430 Introduction to Elliptic Curves (3), and MATH 4900 Project Course in Applied Mathematics 1 (3).

Microbiology

The Department is proposing the addition of one course: **MBIO 2410 Essentials of Molecular Biology (3).**

Physics & Astronomy

The Department is proposing the introduction of two courses: **PHYS 4360 Medical Radiation Physics (3)** and **PHYS 4400 Medical Imaging (3)**; and the modification of one course **PHYS 2152 Modern Physics for Engineers (3)**. In addition, the Department proposes the modification of the following 10 courses to remove reference to MATH 1530 or MATH 1730 (which have never been offered): **PHYS 1050 Physics 1: Mechanics (3)**, **PHYS 1070 Physics 2: Waves and Modern Physics (3)**, **PHYS 2152 Modern Physics for Engineers (3)**, **PHYS 2200 Electricity and Magnetism (6)**, **PHYS 2250 Introductory Modern Physics (3)**, **PHYS 2260 Optics (3)**, **PHYS 2380 Quantum Physics 1 (3)**, **PHYS 2390 Theoretical Physics 1 (3)**, **PHYS 2600 Electromagnetic Field Theory (3)**, and **PHYS 4640 Introduction to Quantum Mechanics for Advanced Students 1 (3)**. The Department proposes modifications to the requirements of the Honours Degree program including the addition of a third stream: Medical and Biological.

Statistics

The Department is proposing the deletion of 9 courses: **STAT 3010 Topics in Statistical Analysis Applied to Business (3)**, **STAT 3120 Topics in Regression Analysis (3)**, **STAT 3130 Statistical Analysis of Designed Experiments (3)**, **STAT 3180 Exploratory Data Analysis (3)**, **STAT 3500 Intermediate Statistical Theory I (3)**, **STAT 3600 Intermediate Statistical Theory II (3)**, **STAT 4140 Introduction to Statistical Inference (3)**, **Stat 4620 Mathematical Probability (3)**, and **STAT 4560 Probability Theory (6)**; the addition of 5

courses: **STAT 3000 Applied Linear Statistical Models (3)**, **STAT 3400 Introduction to Probability 2 (3)**, **STAT 3800 Mathematical Statistics (3)**, **STAT 4100 Statistical Inference I (3)**, and **STAT 4200 (3)**; and the modification of 11 courses: **STAT 2220 Contemporary Statistics for Engineers (3)**, **STAT 2400 Introduction to Probability (3)**, **STAT 3050 Introduction to Probability Theory and Its Applications (3)**, **STAT 3470 Statistical Methods for Research Workers (3)**, **STAT 4170 Lifetime Data Analysis (3)**, **STAT 4520 Sampling Techniques I (3)**, **STAT 4530 Design of Experiments I (3)**, **STAT 4600 Statistics Topics (3)**, **STAT 4630 Stochastic Processes (3)**, **STAT 4690 Applied Multivariate Analysis (3)**, and **STAT 4700 Statistical Consulting (3)**. The Department is also proposing the modification of the requirements for the following programs: Statistics Honours degree, Statistics Major degree, Statistics Minor, Statistics-Actuarial Mathematics Joint Honours, Statistics-Mathematics Joint Honours, and the Statistics-Economics Joint Honours.

Minors

The Faculty is proposing modification to sections 3.7 and 5.14 of the Science section of the General Calendar with respect to acceptable minors in Science.

13. Collège universitaire de Saint Boniface

Psychology

The Collège is proposing the introduction of one course: **PSYC 3131 Psychologie de santé (3)**.

Mathematics

The Collège is proposing the introduction of three courses: **MATH 0401 Habiletés mathématiques (0)**, **MATH 3821 Introduction à la modélisation mathématique 1 (3)**, and **MATH 4921 Sujets choisis en mathématiques (3)**. To reflect modifications by the Mathematics department, the Collège is proposing modification of 13 courses: **MATH 1191 Sujets choisis en mathématiques**, **MATH 1201 Éléments de mathématiques discrètes**, **MATH 1301 Géométrie vectorielle et algebra linéaire**, **MATH 1501 Introduction au Calcul**, **MATH 1701 Calcul 2**, **MATH 2301 Algèbre linéaire 2**, **MATH 2501 Introduction à la théorie des nombres**, **MATH 2551 Géométrie moderne**, **MATH 2601 Mathématiques numériques 1**, **MATH 2721 Calcul à plusieurs variables**, **MATH 2731 Suites et séries**, **MATH 2801 Équations différentielles ordinaires et leur applications I**, and **MATH 3601 Mathématiques numériques 2**.

Traduction

The Collège is proposing the modification of two courses: **TRAD 3461 Littérature et civilisation d'Amérique latine (3)**, and **TRAD 3561 Cours avancé d'espagnol professionnel (3)**.

Recommendations

The Senate Committee on Curriculum and Course Changes recommends that curriculum and course changes from the units listed below be approved by Senate:

Faculty of Agricultural & Food Sciences

Faculty of Arts

Faculty of Engineering

Clayton H. Riddell Faculty of Environment, Earth, and Resources

Faculty of Human Ecology

Faculty of Kinesiology and Recreation Management

Faculty of Nursing

Faculty of Science

Collège universitaire de Saint-Boniface

Respectfully submitted,

Professor H. Frankel, Chair
Senate Committee on Curriculum and Course Changes

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Faculty of Agricultural & Food Sciences

Animal Science

Course introduction:

ANSC 4240 Mathematical Modeling of Biological Systems Cr.Hrs. 3 +3
Lectures and computer based laboratory exercises will be used to discuss mathematical modeling methods applied to biological systems taking aspects of animal science as a model to develop modeling techniques. Prerequisite: MATH 1500 or MATH 1520.

NET CHANGE IN CREDIT HOURS: +3

Plant Science

Course introduction:

PLNT 4610 Bioinformatics Cr.Hrs. 3 +3
An introduction to the theory, strategies, and practice of data management and analysis in molecular biology. Topics include DNA and protein sequence analysis, biological databases, genomic mapping, and analysis of gene expression data. The course will include problem-solving exercises using Unix server-based software.

NET CHANGE IN CREDIT HOURS: +3

Soil Science

Course introduction:

SOIL 3610 Field Methods in Land Resource Science Cr.Hrs. 3

+3

This course provides students with training in field methods used in soil science and related sciences (hydrology, meteorology, ecology, geomorphology, and environmental science). Students participate in a biophysical survey of a field site and in a study of the management, assessment and monitoring of land resources. Prerequisite: SOIL 3600.

NET CHANGE IN CREDIT HOURS:

+3

Food Science

Course deletions:

FOOD 4300 Food Toxicants Cr.Hrs. 3

-3

FOOD 4280 Food Microbiology 2 Cr.Hrs. 3

-3

FOOD 4520 The Packaging of Food Cr.Hrs. 3

-3

NET CHANGE IN CREDIT HOURS:

-9

Program modifications:

In the Animal Systems Program, Group 3 restricted electives will be expanded to include ANSC 4240 Mathematical Modeling of Biological Systems.

Restricted Electives

Group 3

Two courses (six credit hours) from the following:

BIOE 4510 Agricultural Waste Management (3)

ANSC 4280 Applied Animal Genetics (3)

ANSC 4410 Grassland Agriculture: Plant, Animal and Environment (3)

/PLNT 4410

ANSC 4500 Animal Health (3)

ANSC 4510 Domesticated Animal Behaviour (3)

ANSC 4240 Mathematical Modeling of Biological Systems (3)

ENTM 3160 Veterinary and Wildlife Entomology (3)

FOOD 3500 Processing of Animal Food Products (3)

In the Agroecology Degree, Group 2 restricted electives will be expanded to include SOIL 3610 Field Methods in Land Resource Science.

Restricted Electives

Group 2

Two courses (six credit hours) from the following:

SOIL 3060 Introduction to Agrometeorology (3)

SOIL 3610 Field Methods in Land Resource Science (3)

SOIL 4060 Physical Properties of Soils (3)

SOIL 4530 Land Use and Environment (3)

SOIL 4520 Soil Fertility (3)

or

SOIL 4130 Soil Chemistry and Mineralogy (3)

The minor in Soil Science will be modified to add SOIL 3610 Field Methods in Land Resource Science as an option.

Soil Science

Students may obtain a minor in Soil Science (18 credit hours) by completing SOIL 3600 Soils and Landscapes in our Environment plus an additional 15 credit hours from the following list of courses: SOIL 3060 Introduction to Agrometeorology, SOIL 3520 Pesticides: Environment, Economics and Ethics, **SOIL 3610 Field Methods in Land Resource Science**, SOIL 4060 Physical Properties of Soils, SOIL 4130 Soil Chemistry and Mineralogy, SOIL 4400 Soil Ecology, SOIL 4500 Remediation of Contaminated Land, SOIL 4510 Soil and Water Management, SOIL 4520 Soil Fertility, SOIL 4530 Land Use and Environment.

Faculty of Arts

Anthropology

Course deletion:

ANTH 3390 Methods in Ethnology (B) Cr.Hrs. 3

-3

Course introduction:

ANTH 3930 Ethnographic Research Methods (B) Cr.Hrs. 3

+3

A survey of ethnographic research methods with an emphasis on qualitative approaches, including both field and analytical techniques. Students may not hold credit for both ANTH 3930 and the former ANTH 3390 (076.339).

Course modification:

ANTH 3750 Anthropological Perspectives on Globalization and the World-System (B) Cr.Hrs. 3

(Formerly 076.375) An anthropological perspective on the modern world-system and the expansion of capitalism into peripheral areas of the world; the transformation of indigenous societies and cultures; the rise of ethnic conflict, protest and resistance; and a comparative examination of selected global and transnational processes. Students may not hold credit for both ANTH 3750 (076.375) and ANTH 3751 (076.375). Prerequisite: [a grade of "C" or better in one of: ANTH 1220 (076.122) or ANTH 1221

(076.122) or ANTH 1520 (076.152) or ANTH 2390 (076.239) or ANTH 2391 (076.239) or the former 076.109 or the former 076.120] or written consent of instructor.

NET CHANGE IN CREDIT HOURS:

0 HOURS

Program modification:

In the Advanced Major Program, for the optional courses in Year 3, ANTH 3390 Methods in Ethnology (B) is being replaced by ANTH 3930 Ethnographic Research Methods (B).

Anthropology

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- Revisions to the Advanced Major Program

Added material

~~Deleted material~~

8.1.3 Anthropology, Department Code: 076

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
ADVANCED MAJOR ¹ TOTAL: 60 CREDIT HOURS			
ANTH 1210 and ANTH 1220 (or ANTH 1520)	ANTH 2390	<ul style="list-style-type: none"> • ANTH 3470 • one of ANTH 2890, ANTH 3390, ANTH 3930, ANTH 3730, ANTH 3950, ANTH 3980, ANTH 3990 	<ul style="list-style-type: none"> • ANTH 4850 • 9 credit hours in Anthropology (of these a minimum of 3 credit hours must be at the 4000 level). No more than 6 credit hours may be taken from ANTH 4830 and ANTH 4840
Required in years two and three are six additional credit hours from each of groups B, C, and D; an additional 12 credit hours in Anthropology preferably including courses from Group E and ANTH 2370. A minimum of 9 credit hours (in addition to ANTH 3470) must be at the 3000 level. Students considering graduate studies should include a quantitative methods course among their non-Anthropology electives (e.g., Sociology SOC 2290, Statistics STAT 1000 and STAT 2000).			

NOTE:

¹ Courses NATV 2070 and NATV 2080 offered by the Department of Native Studies count for credit (Category B) towards a General Major and Advanced Major in Anthropology.

Asian Studies

Course deletion:

ASIA 2070 South Asian Civilization Cr.Hrs. 6

-6

Course introduction:

ASIA 2080 South Asian Civilization Cr.Hrs. 3

+3

An interdisciplinary study of the Indian subcontinent from the ancient to the contemporary period, focusing on geographic, religious, historic, sociological, and political developments. Students may not hold credit for both ASIA 2080 and the former ASIA 2070 (150.207).

Course modification:

ASIA 2760 Intermediate Chinese (Mandarin) Cr.Hrs. 6

(Formerly 150.276) Continues the introduction of basic vocabulary, grammatical structures, and written characters. Emphasis will be given to the development of aural/oral skills. Not open to students who have previously obtained credit for ASIA 2360 (150.236) or ASIA 3760 (150.376). Prerequisite: [a grade of "C" or better in ASIA 1760 (150.176)] or written consent of instructor.

NET CHANGE IN CREDIT HOURS:

-3 HOURS

Program modification:

In the General Major Program, U1 year is being modified by the deletion of HIST 1410. In Year 2, ASIA 2070 is being deleted from the optional courses and replaced by ASIA 2080.

In the Minor Program, HIST 1410 is being deleted from the U1 year.

The following courses on List A will be flagged as no longer offered: ASIA 2070 South Asian Civilization (6), HIST 1410 Asian Civilizations (6), HIST 3960 China, 1911 to Present (3), HIST 4940 Revolutionary China: A Century of Upheaval, 1870 to Present (6). Two courses will be added to List A: ASIA 2080 South Asian Civilization (3) and HIST 2654 History of the People's Republic of China, 1949-Present (6).

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- Added material
~~Deleted material~~

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
GENERAL MAJOR TOTAL: 30 CREDIT HOURS			
HIST-1410 or both ASIA 1420 (HIST 1420) and ASIA 1430 (HIST 1430)	<ul style="list-style-type: none"> 6 credit hours in one of the language courses numbered at the 1000 level from List A 6 credit hours from ASIA 2080, ASIA 2070 or ASIA 2620, or and ASIA 2630 6 credit hours in courses numbered at the 2000 level from List A 	6 credit hours from courses in List A numbered above the 2000 level (Students may substitute up to 6 credit hours in Asian language courses numbered at the 2000 level.)	
Students who wish to concentrate heavily on languages may take an Asian language course numbered at the 1000 level in University 1. Students with matriculation in an Asian language may do an Asian language course numbered at the 2000 level in Year 2 and are encouraged to take a language course numbered at the 3000 level language in Year 3.			
MINOR TOTAL: 18 CREDIT HOURS			
HIST-1410 or both ASIA 1420 (HIST 1420) and ASIA 1430 (HIST 1430)	12 credit hours chosen from List A		

List A Courses Acceptable for Asian Studies Credit			ASIA 2360	Mandarin Comprehension	6
Course No.	Credit Hours		ASIA 2760	Intermediate Chinese (Mandarin)	6
Faculty of Arts			ASIA 2770	Intermediate Japanese	6
Anthropology			ASIA 2780	Intermediate Sanskrit	6
			ASIA 2790	Intermediate Hindi-Urdu	6
ANTH 2450	Ethnology of China	3	ASIA 3660	Advanced Mandarin Comprehension	6
Asian Studies Asian Languages			ASIA 3760	Advanced Chinese (Mandarin)	6
ASIA 1760	Introduction to Chinese (Mandarin)	6	ASIA 3770	Advanced Japanese	6
ASIA 1770	Introduction to Japanese	6	ASIA 3790	Advanced Hindi-Urdu	6
ASIA 1780	Basic Sanskrit	6	Asian Studies Other Asian courses		
ASIA 1790	Basic Hindi-Urdu	6	ASIA 1420	Asian Civilizations to 1500 (Same as HIST 1420)	3
ASIA 2340	Special Studies in Epic and Pauranic Sanskrit 1	3	ASIA 1430	Asian Civilizations from 1500 (Same as HIST 1430)	3
ASIA 2350	Special Studies in Epic and Pauranic Sanskrit 2	3	<u>ASIA 2080</u>	<u>South Asian Civilization</u>	<u>3</u>

ASIA 2070*	South Asian Civilization	6	Religion	
ASIA 2570	History, Culture and Society in Chinese Film	3	RLGN 1320	Introduction to World Religions 6
ASIA 2580	Women in Chinese Film	3	RLGN 1321	Introduction aux religion du monde 6
ASIA 2600	Japanese Film	3	RLGN 2540	Modern Movements in World Religions 6
ASIA 2620	Japanese Civilization	3	RLGN 2570	Indian Religious Art and Architecture 3
ASIA 2630	Chinese Civilization	3	RLGN 2700	Religions of China and Japan 6
ASIA 2650	Premodern Chinese Literature in Translation	3	RLGN 3750	Topics in Indian Religious Art and Architecture 3
ASIA 2660	Modern Chinese Literature in Translation	6	020.266*	Religions of Indian Origin 6
ASIA 2670	Modern Japanese Literature in Translation	3	020.374*	Studies in Asian Religions 6
ASIA 3480	Selected Topics in Asian Studies 1	3	020.441*	Masters of Spiritual Life 6
ASIA 3490	Selected Topics in Asian Studies 2	3	020.445*	Topics in Comparative Religion 6
ASIA 3600	Japanese Popular Culture	3	Sociology	
ASIA 3650	Masterpieces of Asian Literature	6	SOC 3690	Sociology of the Developing Societies 3
150.141*	Asian Civilizations (Same as HIST 1410)	6	School of Art	
150.211*	East Asian Civilization	6	FAAH 2100	Survey of Asian Art 3
History			FAAH 3230	Chinese Art and Architecture 3
HIST 1410*	Asian Civilizations (Same as the former 150.141)	6	FAAH 3240	Japanese Art and Architecture 3
HIST 1420	Asian Civilizations to 1500 (Same as ASIA 1420)	3	FAAH 3590	Islamic Art and Architecture 3
HIST 1430	Asian Civilizations from 1500 (Same as ASIA 1430)	3	Clayton H. Riddell Faculty of Environment, Earth, and Resources	
<u>HIST 2654</u>	<u>History of the People's Republic of China, 1949-Present</u>	3	Geography	
HIST 2050	South Asia Since 1947	3	GEOG 2490	Geography of Modern China 3
HIST 2130	Emergence of Modern South Asia: 1757-1947	3	GEOG 3590	Geography of Developing Countries 6
HIST 2410	History of India	6	*Indicates course no longer offered.	
HIST 2650	Modern China and Japan	6		
HIST 3090	Studies in Asian History	3		
HIST 3580	Topics in Recent World History 1 [Acceptable for credit only when the topic is Asia related]	3		
HIST 3960*	China, 1911 to the Present	3		
HIST 3980	Nationalism on the Indian Sub-Continent in the Twentieth Century	3		
HIST 4200	Modern South Asia: Colonialism, Nationalism, and Modernization	3		
HIST 4940*	Revolutionary China: A Century of Upheaval, 1870 to Present	6		
Political Studies				
POLS 2020	Asian Politics	6		

Canadian Studies

On the list of approved courses in Canadian Studies, SOC 3470 Political Sociology will be flagged as no longer offered, and the following three courses will be added to the list: HIST 4680 Social History of Health and Disease in Modern Canada (C)(6), POLS 4140 Canadian Political Ideas (3), and SOC 3380 Power, Politics and the Welfare State (3).

Canadian Studies Program

2008-2009 Undergraduate Calendar, pages 130-131

- Revisions to the List of Approved Courses in Canadian Studies

Added material

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List of Approved Courses in Canadian Studies

In the following list of approved courses the designation (H) indicates an Honours course. Courses designated (CUSB) are offered in French at Collège universitaire de Saint-Boniface.

* In the list below indicates courses no longer offered.

Faculty of Arts

Canadian Studies

CDN 1130 Introduction to Canadian Studies 6

CDN 3730 Canadian Identity: An Interdisciplinary Approach 3

CDN 4410 Seminar in Canadian Studies (H) 6

Anthropology

ANTH 2040 Native North America: A Sociocultural Survey (B) 3

ANTH 2041 Les Amérindiens de l'Amérique du nord: une étude socioculturelle (B) (CUSB) 3

ANTH 2640 Manitoba Prehistory 3

ANTH 3460 Native North American Ethnology (B) 3

ANTH 3461 Ethnologie des Amérindiens de l'Amérique du Nord (B) (CUSB) 3

ANTH 3500 Peoples of the Arctic (B) 3

ANTH 3501 Peuples de l'Arctique (B) (CUSB) 3

ANTH 3550 Canadian Subcultures 3

ANTH 3551 Sous-cultures canadiennes (CUSB) 3

ANTH 3910 Archaeological Field Training (D,E) 6

Economics

ECON 1210 Introduction to Canadian Economic Issues and Policies 3

ECON 1211 Introduction aux politiques et aux problèmes économiques canadiens (CUSB) 3

ECON 2280 Social Welfare and Human Resources 6

ECON 2310 Canadian Economic Problems 6

ECON 2311 Les problèmes économiques du Canada (CUSB) 6

ECON 2350 Community Economic Development 3

ECON 2360 Women in the Canadian Economy 6

ECON 3300 Canadian Economic History 6

ECON 3510 Industrial Relations (Cross-listed with Labour Studies LABR 3510) 6

ECON 3690 Economic Issues of Health Policy 3

ECON 3720 Urban and Regional Economics and Policies 3

018.352* Introductory Regional Economics 3

018.353* Intermediate Regional Economics 3

018.357* Health Economics 3

018.360* Workshop in the Economy of Canada 6

English, Film, and Theatre

ENGL 2270 Canadian Literature 6

ENGL 3270 Studies in Canadian Literature 3

ENGL 3271 Studies in Canadian Literature 3

004.275* Canadian Literature (H) 6

004.288* Canadian Literature to 1967 3

004.289* Canadian Literature after 1967 3

004.377* Canadian Poetry 6

004.378* The Canadian Novel 6

004.388* Studies in Canadian Literature 6

FILM 2430 The Canadian Film 3

Français (CUSB)

FRAN 2831 L'individu et le pays (CUSB) 3

FRAN 2881 Civilisation canadienne-française (CUSB) 3

FRAN 3531 Le théâtre québécois (CUSB) 3

FRAN 3541 Le théâtre de l'Ouest (CUSB) 3

FRAN 3831 L'époque de la contestation (CUSB) 3

FRAN 3841 La révolution tranquille et le roman (CUSB) 3

FRAN 3851 Le théâtre de l'Ouest: poésie, nouvelles (CUSB) 3

FRAN 3861 Le théâtre de l'Ouest: romans (CUSB) 3

FRAN 4831 Littérature de l'Acadie et des Cajuns (CUSB) 3

French, Spanish and Italian

FREN 2700 Poésie et théâtre canadiens-français (B) 3

FREN 3140	Roman canadien-français (B)	3	HIST 4900	The Hudson's Bay Company and British North America (C) (H)	6
FREN 3850	Civilisation canadienne-française (C)	3	HIST 4950	History of Quebec (C) (H)	6
044.247*	French-Canadian Literature in Translation	6	011.133*	History of Canada from 1534 (C)	6
044.348*	Littérature canadienne-française (H)	3	011.133F*	Histoire du Canada (CUSB)	6
044.353*	Littérature canadienne-française (B)	3	011.254*	North American Indian (A,C,S)	6
History			011.324*	Protestantism and the Development of the Canadian Community, 1749-1970 (C,S)	6
HIST 1390	History of Colonial Canada: 1500-1885 (C)	3	011.438*	Intellectual History of Canada (C) (H)	3
HIST 1400	History of the Canadian Nation Since 1867 (C)	3	011.449*	The New Canada, 1867-96 (S) (H)	6
HIST 1440	History of Canada (C)	6	Icelandic		
HIST 1441	Histoire du Canada (CUSB)	6	ICEL 2230	Contemporary Icelandic-Canadian Literature	3
HIST 2191	Histoire économique et sociale canadienne du XIXe siècle6 (CUSB)	6	ICEL 2300*	Icelandic-Canadian Literature (H)	6
HIST 2280	Aboriginal History of Canada (C)	6	ICEL 3460*	Laura Goodman Salverson	3
HIST 2950	Early Canada: from the Earliest Settlement to 1867 (C)	6	ICEL 4440	The Icelanders in Canada (H)	3
HIST 2951	Les origines du Canada: depuis la première colonie jusqu'en 1867 (CUSB)	6	012.445*	Stephan G. Stephansson (H)	3
HIST 2960	The New Dominion: 1867 to 1921 (C)	6	Labour Studies		
HIST 2961	Le nouveau Dominion: de 1867 à 1921 (CUSB)	6	LABR 3510	Industrial Relations (Cross-listed with Economics ECON 3510)	6
HIST 2970	Modern Canada: 1921 to the Present (C)	6	Native Studies		
HIST 2971	Le Canada moderne: de 1921 à nos jours (CUSB)	6	NATV 1200	The Native Peoples of Canada	6
HIST 3050	Canada since 1945 (C)	6	NATV 1220	The Native Peoples of Canada, Part 1	3
HIST 3220	The History of Canadian-American Relations (A,C)	6	NATV 1240	The Native Peoples of Canada, Part 2	3
HIST 3250	Canada and the World, 1867 to the Present (C)	6	NATV 1250	Introductory Cree 1	3
HIST 3690	History of Northern Canada (C)	6	NATV 1260	Introductory Cree 2	3
HIST 3721	Histoire du Manitoba (C) (CUSB)	6	NATV 1270	Introductory Ojibway 1	3
HIST 3730	A History of Western Canada (C)	6	NATV 1280	Introductory Ojibway 2	3
HIST 3780	Studies in Canadian History 1 (C)	3	NATV 1290	Introductory Inuktitut	3
HIST 3781	Études choisies en histoire du Canada 1 (CUSB)	3	NATV 2020	The Métis of Canada	3
HIST 3790	Studies in Canadian History 2 (C)	3	NATV 2040	Native Peoples of the Northern Plains	3
HIST 3791	Études choisies en histoire du Canada 2 (CUSB)	3	NATV 2060	The Native Peoples of the Eastern Woodlands	3
HIST 3910	The Ukrainians in Canada (C)	3	NATV 2070	The Native Peoples of the Subarctic	3
<u>HIST 4680</u>	<u>Social History of Health and Disease in Modern Canada (C)</u>	<u>6</u>	NATV 2080	Inuit Society and Culture	3
HIST 4060	Gender History in Canada (C) (H)	6	NATV 2220	Native Societies and the Political Process	3
HIST 4280	Topics in the Cultural History of Canada (C)	6	NATV 2250	Intermediate Cree	6
HIST 4340	Introduction to Archival Science (G)	6	NATV 2270	Intermediate Ojibway	6
HIST 4390	The History of White Attitudes and Policies towards Native Peoples in North America (C) (H)	6	NATV 2300	Cree Literature	3
HIST 4700	Canada, 1896 to the Present (C) (H)	6	NATV 2320	Structure of the Cree Language	3
HIST 4720	History of Manitoba (C) (H)	6	NATV 2410	Canadian Native Literature	3
HIST 4890	Canadian Social History (C) (H)	6	NATV 2420	Inuit Literature in Translation	3
			NATV 2450	Images of Indians in North American Society	3

NATV 3000	Selected Topics	3	POLS 3561	Politique étrangère Canadienne (CUSB)	6
NATV 3240	Native Medicine and Health	3	POLS 3670	Canadian Political Parties	3
NATV 3270	The Métis Nation	3	POLS 3860	Canadian Federalism	3
NATV 3280	Aboriginal Peoples and the Canadian Justice System	3	POLS 3960	Canadian Politics	6
NATV 3300	Native Language Planning and Development	3	<u>POLS 4140</u>	<u>Canadian Political Ideas</u>	<u>3</u>
NATV 3310	Canadian Law and Aboriginal Peoples	3	POLS 4150	Indigenous Governance	3
NATV 3320	Aboriginal Organizations	3	POLS 4180	Provincial Politics in Canada	3
NATV 3340	Circumpolar Cultures and Lifestyles	3	POLS 4190	Manitoba Politics and Government	3
NATV 3370	Political Development in the North	3	POLS 4660	The State in the Economy (H)	6
NATV 3380	Cultural Constructions of Gender in Canadian Aboriginal Societies	3	POLS 4860	The Canadian Policy Process (H)	6
NATV 4200	First Nations Government	3	019.156*	Introduction to Canadian Government	6
NATV 4210	Seminar in Contemporary and Historical Métis Issues	3	019.156F*	Introduction au système gouvernemental Canadienne (CUSB)	6
NATV 4220	Environment, Economy and Aboriginal People	3	019.206*	Urban and Local Politics	6
NATV 4230	Traditional Knowledge and Native Studies Research	3	019.256*	Issues of Canadian Politics	6
NATV 4240	Arctic Lifestyles	3	019.266*	Human Rights and Civil Liberties	6
NATV 4250	Topics on Aboriginal Identities	3	019.286*	Canadian Political Parties	6
NATV 4260	Sacred Lands and Sacred Spaces of Indigenous Peoples	3	019.356*	Canadian Foreign Policy	6
NATV 4280	Missionaries, Colonialism and Aboriginal Peoples	3	019.366*	Quebec and the Canadian Political System (H)	3
032.090*	Introductory Cree	6	019.368*	Canadian Defense Policy	3
032.091*	Introductory Ojibway	6	019.476*	Manitoba Politics and Voting Behaviour	6
032.121*	Intermediate Ojibway	6	019.487*	Government and Public Sector Unionism (H)	6
032.130*	Intermediate Cree	6	Religion		
032.205*	Coastal Indians of Canada	3	RLGN 2410	Religion in Canada (C)	6
032.220*	Native Societies and the Political Process	3	RLGN 2411	Les religions au Canada (CUSB)	6
032.321*	The Native Identity	6	RLGN 2590	Religion and Social Issues (C)	3
032.323*	Native Peoples and the Law 2	3	RLGN 2591	La religion et les problèmes sociaux (CUSB)	3
032.325*	Native Peoples and the Law 1	6	020.272*	Dimensions of Religiosity in Contemporary Canadian Literature	6
032.373*	Art of the North American Native Peoples	3	Slavic Studies		
Political Studies			UKRN 2420	Ukrainian Canadian Literature	3
POLS 1070	Law, Politics and Power in Canada	3	UKRN 2430	Ukrainian Canadian Folklore	3
POLS 2070	Introduction to Canadian Government	6	Sociology		
POLS 2071	Introduction au système gouvernemental Canadien	6	SOC 2320	Canadian Society and Culture	3
POLS 2561	Questions d'actualité en politique Canadienne (CUSB)	6	SOC 2321	La société Canadienne et sa culture (CUSB)	3
POLS 2570*	Introduction to Public Administration	6	SOC 2370	Ethnic Relations	3
POLS 2571	Initiation à l'administration publique (CUSB)	6	SOC 2371	Rapports ethniques (CUSB)	3
POLS 3100	Gender and Politics in Canada	3	SOC 2531	Sociologie du Manitoba (CUSB)	6
POLS 3170	The Canadian Charter of Rights and Freedoms	3	SOC 2610	Sociology of Criminal Justice and Corrections	3
POLS 3470	Canadian Public Management	3	SOC 2620	The Sociology of Aging	3
POLS 3520	Canadian Foreign and Defence Policy	6	<u>SOC 3380</u>	<u>Power, Politics and the Welfare State</u>	<u>3</u>

SOC 3470*	Political Sociology	3
SOC 3471	Sociologie politique (CUSB)	3
SOC 3700	Sociology of Law	3
Ukrainian Canadian Heritage Studies		
UCHS 3100	The Ukrainian Arts in Canada	3

School of Art

FAAH 3260	Canadian Art and Architecture to World War II	3
FAAH 3270	Canadian Art Since World War II	3
FAAH 3430	Inuit Art	3
054.358*	Inuit Culture and Art	3
054.375*	Canadian Art 1	3
054.376*	Canadian Art 2	3

Clayton H. Riddell Faculty of Environment, Earth, and Resources

Geography		
GEOG 2450	The Making of the Prairie Landscape (A)	6
GEOG 2570	Geography of Canada (A)	3
GEOG 3431	Géographie du Canada (CUSB)	3
GEOG 3480	Canadian Problems	3
GEOG 3481	Particularités de la géographie du Canada (CUSB)	3
GEOG 3700	Canada: The Making of the Human Landscape (A)	6
GEOG 3701	Canada: évolution de l'écosystème (CUSB)	6
053.369*	Historical Geography of Indian Peoples in the Canadian Fur Trade	6
053.378*	Historical Geography of Canadian Indians (A)	6
053.470*	Historical Geography of the Ojibway Indians (H)	3

For course descriptions, see departmental listings.

NOTE: Courses annotated by appearing in the various departmental course listings, may be used toward partial fulfillment of the requirements for Canadian Studies.

Central and East European Studies

Program modification:

In the General Major, Advanced Major, Minor and Honours Double Program, references to requirements from "List A" and "List B" will be replaced by "the list of approved courses in Central and East European Studies".

In the Minor Program, footnote 4 will be added "Students who have declared a major in Russian, German, or Ukrainian can either take 12 credit hours from at least two different subject fields from the List of Approved Courses in Central and East European Studies, or 6 credit hours from courses numbered at the 1000 or 2000 level in a language (Russian, German, Ukrainian, or Polish) other than their declared major and 6 credit hours from the List of Approved Courses in Central and East European Studies".

List A is being deleted. List B is being renamed "List of Approved Courses in Central and East European Studies" and the following courses are being added: GRMN 1300 Masterpieces of German Literature in English Translation (3), GRMN 3262 Representations of the Holocaust in English

Translation (3), GRMN 3282 Sex, Gender and Cultural Politics in the German-Speaking World in English Translation (3), RUSN 1400 Masterpieces of Russian Literature in Translation (3), HIST 3062 German and German-Jewish History, 1618 to the Present (E)(6), HIST 3064 German and German-Jewish History, 1618-1900 (E)(3) and HIST 3066 German and German-Jewish History, 1900 to the Present (E)(3). The following two courses will be flagged as no longer offered: RUSN 2770 Masterpieces of Russian Literature in Translation (3), and HIST 3060 German and German Jewish History, 1780-1933 (E)(3).

Central and East European Studies

2008-2009 Undergraduate Calendar, pages 133-134

- Revisions to the General Major and Minor
- Deletion of List A
- Renaming and Revisions to List B

Added material

~~Deleted material~~

8.5.2 Central and East European Studies, Program Code: 0995

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
GENERAL MAJOR TOTAL: 30 CREDIT HOURS			
6 credit hours in a language from courses numbered at the 1000 or 2000 level in Russian, German, Ukrainian or Polish, plus 6 credit hours from <u>the list of approved courses in Central and East European Studies List A or List B</u>	18 credit hours from <u>the list of approved courses in Central and East European Studies List B</u> below, of which at least 6 credit hours must be taken from each of 2 different departments		
ADVANCED MAJOR TOTAL: 48 CREDIT HOURS			
6 credit hours in a language from courses numbered at the 1000 or 2000 level in Russian, German, Ukrainian or Polish, plus 6 credit hours from <u>the list of approved courses in Central and East European Studies List A or List B</u>	36 credit hours from <u>the list of approved courses in Central and East European Studies List B</u> below, of which at least 12 credit hours must be taken from each of two different departments		
MINOR TOTAL: 18 CREDIT HOURS			
6 credit hours in a language from courses numbered at the 1000 or 2000 level in Russian, German, Ukrainian or Polish, plus 6 credit hours from <u>the list of approved courses in Central and East European Studies List A or List B</u>	6 credit hours from <u>the list of approved courses in Central and East European Studies List B</u> below		
HONOURS DOUBLE ¹			
6 credit hours in a language from courses numbered at the 1000 level ² in Russian, German, Ukrainian, Polish, plus 18 credit hours from <u>the list of approved courses in Central and East European Studies List A or List B</u>	<ul style="list-style-type: none">▪ either UKRN 2720 or RUSN 2810³▪ 6 credit hours from the following, Economics: ECON 2270; History: HIST 2490, HIST 2600, HIST 2610, HIST 2660, HIST 2680; Slavic Studies: RUSN 2280, RUSN 2290, UKRN 2770, UKRN 2780▪ 12 credit hours in other Honours field▪ 6 credit hours in options		
	<ul style="list-style-type: none">▪ either both RUSN 3200 and RUSN 3210, or both UKRN 3950 and UKRN 3960³▪ 6 credit hours from the following, History: HIST 3030; Slavic Studies: UKRN 3670▪ minimum of 12 credit hours in other Honours field		
	<ul style="list-style-type: none">▪ 12 credit hours from the following, Economics: ECON 4450; History: HIST 4300▪ minimum of 12 hours of credit in other Honours field		
NOTES:			

¹ The double Honours program is only available to students registered in the Honours program in Economics, History, or Political Studies.

² Students should note that while the majority of students begin language instruction with courses numbered at the 1000 level, in exceptional circumstances and with the approval of the committee, students may begin language instruction with courses numbered at the 2000 level.

³ Students who begin with 6 hours of courses numbered beyond the 1000 level in Russian or Ukrainian may take either 6 or 12 credit hours in Russian or Ukrainian or 6 or 12 credit hours in another language approved by the committee.

⁴ Students who have declared a major in Russian, German, or Ukrainian can either take 12 credit hours from at least two different subject fields from the List of Approved Courses in Central and East European Studies, or 6 credit hours from courses numbered at the 1000 or 2000 level in a language (Russian, German, Ukrainian, or Polish) other than their declared major and 6 credit hours from the List of Approved Courses in Central and East European Studies.

List A

Faculty of Arts

Economics

ECON 1200 Principles of Economics 6

History

HIST 1200 An Introduction to the History of Western Civilization 6

or

HIST 1350 An Introduction to the History of Western Civilization 3
to 1500

and

HIST 1360 An Introduction to the History of Western Civilization 3
from 1500

Political Studies

POLS 1500 Introduction to Politics 6

or

POLS 2040 Introduction to International Relations 6

School of Art

FAAH 1030 Introduction to Art 1A 3

FAAH 1040 Introduction to Art 2A 3

FAAH 1050 Introduction to Art 1B 3

FAAH 1060 Introduction to Art 2B 3

Clayton H. Riddell Faculty of Environment, Earth, and Resources

Geography

GEOG 1200 Introductory Geography 6

or

GEOG 1280 Introduction to Physical Geography 3

-and

GEOG 1290 Introduction to Human Geography 3

List B List of Approved Courses in Central and East European Studies

Faculty of Arts

Economics

ECON 2270 European Economic History 6

ECON 2510 The Economy of Ukraine 3

ECON 4450 Comparative Economic Systems 6

German and Slavic Studies

GRMN 1300 Masterpieces of German Literature in English Translation 3

GRMN 2120 Introduction to German Culture 1 3

GRMN 2130 Introduction to German Culture 2 3

GRMN 3262 Representations of the Holocaust in English Translation 3

GRMN 3282 Sex, Gender and Cultural Politics in the German-Speaking World in English Translation 3

GRMN 3260 Representations of the Holocaust 3

GRMN 3270 Studies in Contemporary German Cinema 3

GRMN 3280 Sex, Gender and Cultural Politics in the German-Speaking World 3

GRMN 3290 History in Literature in German-Speaking Countries 3

GRMN 3390 German Representations of War 3

GRMN 3392 German Representations of War 3

GRMN 3520 Special Topics in Comparative German and Slavic Studies 6

RUSN 1400 Masterpieces of Russian Literature in Translation 3

RUSN 2280 Russian Culture 1 3

RUSN 2290 Russian Culture 2 3

RUSN 2740 Literature and Revolution 3

RUSN 2750 Contemporary Russian Literature and Film 3

RUSN 2770* Masterpieces of Russian Literature in Translation 3

SLAV 2240 East European Literature 1 3

SLAV 2250 East European Literature 2 3

SLAV 2260 Russia, Ukraine and Poland Cultures in Dialogue 1 3

SLAV 2270 Russia, Ukraine and Poland Cultures in Dialogue 2 3

SLAV 3520	Special Topics in Comparative German and Slavic Studies	6
UKRN 2770	Ukrainian Culture 1	3
UKRN 2780	Ukrainian Culture 2	3
UKRN 3670	Contemporary Ukrainian Literature	3
UKRN 3850	Ukrainian Short Story	3
History		
HIST 2490	History of Russia	6
HIST 2600	Introduction to Ukraine	3
HIST 2610	Making of Modern Ukraine	3
HIST 2660	History of the Soviet Union (E)	3
HIST 2661	Histoire de l'Union soviétique (E)	3
HIST 2840	A History of Russia to 1917	3
HIST 2841	Histoire de la Russie jusqu'en 1917 (E)	3
<u>HIST 3062</u>	<u>German and German-Jewish History, 1618 to to the Present (E)</u>	<u>6</u>
<u>HIST 3064</u>	<u>German and German-Jewish History, 1618-1900 (E)</u>	<u>3</u>
<u>HIST 3066</u>	<u>German and German-Jewish History, 1900 to the Present (E)</u>	<u>3</u>
HIST 3030	Issues in Ukrainian History	3
HIST 3060*	German and German Jewish History, 1780-1933 (E)	3
HIST 3180	Modern Russian: The Soviet Era and Beyond	6
HIST 4300	Problems in Modern Russian and Soviet History	6
011.255*	History of Ukraine	6
Political Studies		
POLS 3720	Politics, Government and Society in Ukraine	3
POLS 3810	Introduction to Marxism	3
POLS 2920*	Government, Politics and Society in Ukraine	6
POLS 4810*	Seminar in Marxist-Leninist and Contemporary Marxist Political Theory	6
Religion		
RLGN 1350	The History of Eastern Christianity (A)	6
School of Art		
FAAH 3160	Topics in 20th Century Art (only when topic focuses on Central and Eastern Europe)	3
FAAH 3280	Early Byzantine Art and Architecture	3
FAAH 3290	Later Byzantine Art and Architecture	3
FAAH 4070	Seminar in Art History 1 (when its focus is on Central and Eastern Europe)	3
FAAH 4080	Seminar in Art History 2 (when its focus is on Central and Eastern Europe)	3
Clayton H. Riddell Faculty of Environment, Earth, and Resources		
Geography		

*GEOG 3600 Geography of Ukraine
 *indicates course no longer offered.

3

Economics

Course modification:

ECON 4140 Evaluation of Economic Policy and Programs Cr.Hrs. 3

This is a course in applied micro-economic policy analysis using the techniques of cost-benefit analysis as its foundation. Students will learn the welfare foundations of cost-benefit analysis, techniques for decision-making under conditions of risk and uncertainty, and how these techniques may be applied to public policy. The course will include examples from all areas of public policy, including health, education, social services criminal justice, etc. Prerequisite: written consent of department head.

NET CHANGE IN CREDIT HOURS:

0 HOURS

Program modifications:

Economics Honours Single and Honours Double – Years 2/3/4 of the program are being modified by the deletion of the optional courses STAT 1000 and STAT 2000; footnote 8 which refers to this is being deleted.

Department of Economics
2008-2009 Undergraduate Calendar, pages 138-139

- Revisions to the Honours Single and Honours Double Programs
- Revisions to Program Notes

Added material

~~Deleted material~~

Preparation for Graduate Studies

Honours students contemplating graduate work should normally seek to obtain a good background in both mathematics and statistics. For mathematics, it is strongly recommended that they take ECON 2530 Introduction to Mathematical Economics and seriously consider ECON 3730 Topics in Mathematical Economics. For a good statistics background, STAT 1000 Basic Statistical Analysis 1, STAT 2000 Basic Statistical Analysis 2, ECON 4120 Intermediate Econometrics and ECON 4130 Seminar in Econometrics in combination with some basic statistics courses are highly desirable. Such students are also advised to include at least one course in economic history in their program. These, or equivalents, are required of doctoral candidates at the University of Manitoba.

B.B.3 Economics, Department Code: 018

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
GENERAL MAJOR^{1,2} TOTAL: 30 CREDIT HOURS			
ECON 1200 or both ECON 1210 and • Two of: ECON 2450 ² , ECON 2460 ² , ECON 2470 ² , ECON 2480 ² ECON 1220 ^{8,9}			
• An additional 18 credit hours in Economics, of which at least 6 hours must be from courses numbered at the 3000 level			
ADVANCED MAJOR¹ TOTAL: 48 CREDIT HOURS			
ECON 1200 or both ECON 1210 and • ECON 2450 ^{3,4} , ECON 2460 ^{3,4} , ECON 2470 ^{3,4} , ECON 2480 ^{3,4} , ECON 3170 ⁴ , ECON 3180 ⁴ ECON 1220 ^{8,9}			
• ECON 4820 ⁴ or ECON 4830 ⁴			
• An additional 18 credit hours in Economics			
MINOR¹ TOTAL: 18 CREDIT HOURS			
ECON 1200 or both ECON 1210 and An additional 12 credit hours in Economics ECON 1220 ^{8,9}			
HONOURS SINGLE^{5, 6,2,10}			
ECON 1200 or both ECON 1210 and • 54 credit hours in Economics courses, to include the following: ECON 1220 ^{8,9}			
- ECON 2700, ECON 2800, ECON 3700, ECON 3800, ECON 3810, ECON 4410			
- One of the following combinations: ECON 3170 and ECON 3180; ECON 4120 and ECON 4130; STAT 1000 and STAT 2000 ⁸			
- A further 27 credit hours in Economics, of which: no more than 6 additional hours can be from courses numbered at the 2000 level (other than ECON 2530); and at least 6 additional hours must be from courses numbered at the 4000 level			
• 6 credit hours from the following Mathematics courses: MATH 1300, MATH 1310, MATH 1500, MATH 1510, MATH 1520, MATH 1690, MATH 1700, MATH 1710			
• 24 credit hours in ancillary options			

HONOURS DOUBLE^{5, 7,10}

ECON 1200 or both ECON 1210 and • 36 credit hours in Economics courses, to include the following:
ECON 1220^{8,9}

- ECON 2700, ECON 2800, ECON 3700

- One of the following combinations: ECON 3170 and ECON 3180; ECON 4120 and ECON 4130; ~~STAT 1000 and STAT 2000⁸~~

- A further 21 credit hours in Economics, of which: no more than 6 additional hours can be from courses numbered at the 2000 level (other than ECON 2530); and at least 6 hours must be from courses numbered at the 4000 level

• At least 36 credit hours in other Honours field

• At least 6 credit hours in ancillary options

NOTES:

¹ For the purposes of satisfying program requirements in the Major, Advanced Major and Minor programs, and of satisfying course prerequisites, Honours courses are acceptable as substitutes for general courses according to the following schedule: ECON 2700 for ECON 2450; ECON 3700 for ECON 2460; ECON 2800 for ECON 2470; ECON 3800 for ECON 2480. For each pair, students may hold credit for only one course.

² In cases where students have been granted three hours of unallocated transfer credit in Economics at the 1000 level, and have achieved additional credits in Economics from The University of Manitoba, and wish to declare Economics as a General Major without having full credit in ECON 1200, then the Years 2-3 requirement for a Major in Economics will be ECON 2450 and ECON 2470, plus an additional 18 credit hours in Economics of which at least 6 hours must be at the 3000 level.

³ Students in the Advanced Major are urged to take ECON 2450, ECON 2460, ECON 2470 and ECON 2480 in Year 2, but must take at least two of these courses in Year 2.

⁴ Course ECON 4820 or ECON 4830 may not be taken until the final year of the program and only after students have successfully completed ECON 3170 and ECON 3180, plus all of the following: ECON 2450, ECON 2460, ECON 2470, ECON 2480. A grade of "C" or better in each course is required.

⁵ For the purpose of satisfying program requirements in the Honours programs and of satisfying course prerequisites, General theory courses are acceptable substitutes for Honours theory courses according to the following schedule: As substitute for ECON 2700, ONE of the following conditions must be satisfied: (i) grades of B or better in each of ECON 2450 and ECON 2460; (ii) a grade of A or better in ECON 2450. As substitute for ECON 2800, ONE of the following conditions must be satisfied: (i) grades of B or better in each of ECON 2470 and ECON 2480; (ii) a grade of A or better in ECON 2470.

⁶ To meet a minimum required background in mathematics, Single Honours students must complete 6 credit hours in Mathematics in Year 2 (or Year 3 with departmental approval). Students contemplating entering the Single Honours Program in Economics are advised to take the Mathematics requirement in their first year of studies. Students contemplating graduate work in Economics should refer to the notes above "Preparation for Graduate Studies".

⁷ Students contemplating Double Honours in Economics and Mathematics are advised to consult the Department of Economics for specific details.

⁸ ~~Statistics STAT 1000 and STAT 2000 are acceptable in place of ECON 3170 and ECON 3180 or in place of ECON 4120 and ECON 4130 but will not count toward the 54 hours of Economics required for Single Honours or toward the 36 hours of Economics required by the Double Honours program. Students contemplating graduate work in Economics should refer to the notes above "Preparation for Graduate Studies".~~

^{8,9} A maximum of 6 credit hours at the 1000 level may be used towards a Major, Minor or Honours Program.

^{9,10} Ancillary options are courses taken from outside the Honours field of study.

In the Program Notes for the Economics-Mathematics Joint Honours Program, footnotes 1 and 2 are being modified by the deletion of reference to MATH 1530 and MATH 1730. In the Program Notes for the Economics-Statistics Joint Honours Program, footnote 1 is being modified by the deletion of reference to MATH 1530 and MATH 1730.

Economics-Mathematics Joint Honours Program
2008-2009 Undergraduate Calendar, pages 139-140

- Revisions to Program Notes

Added material
~~Deleted material~~

8.8.5 Economics-Mathematics Joint Honours Program, Program Code: 136E

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS TOTAL: 120 CREDIT HOURS			
<ul style="list-style-type: none"> ECON 1200 (or both ECON 1210 and ECON 1220); MATH 1300¹; MATH 1500^{1,2}; MATH 1700^{1,2}; STAT 1000³; COMP 1010³ Plus 9 credit hours of electives⁵ which should include the required "Written English" course 	<ul style="list-style-type: none"> ECON 2700, ECON 2800, MATH 2202, MATH 2352, MATH 2750, MATH 2800 Plus 6 credit hours of approved electives⁶ 	<ul style="list-style-type: none"> ECON 3700; ECON 3800; ECON 3180³ (or STAT 2000³); MATH 2600³; MATH 3230; MATH 3300³; MATH 3400; MATH 3700 (or MATH 3710); MATH 3740 (or MATH 3760) Plus 24 credit hours of approved Economics courses⁴ Plus 6 credit hours of Mathematics courses at the 3000 or 4000 level, which must include at least one of MATH 3510, MATH 3600, MATH 3810, MATH 3820, or any Mathematics course at the 4000 level 	
30 HOURS	30 HOURS	60 HOURS	

NOTES:

¹ MATH 1310 may be taken in place of MATH 1300; MATH 1510, ~~or~~ MATH 1520 ~~or~~ MATH 1530 may be taken in place of MATH 1500; MATH 1710 ~~or~~ MATH 1730 may be taken in place of MATH 1700.

² The combination of MATH 1500 (or MATH 1510 or MATH 1520 ~~or~~ MATH 1530) and MATH 1700 may be replaced by MATH 1690.

³ Some courses may be taken in a different year than indicated; STAT 1000, COMP 1010, MATH 2600 and ECON 3180 (or STAT 2000) may be taken in Year 2. The normal prerequisite for ECON 3180 is ECON 3170, which will be waived for students in this program who have completed Year 1.

⁴ Of the 24 credit hours in electives in Economics in Years 3 and 4, no more than 6 credit hours may be at the 2000 level or below (with the exception of ECON 2530) and at least 6 credit hours must be at the 4000 level.

⁵ MATH 3300, plus 3 of the 6 unallocated credit hours in Mathematics in Years 3 and 4, may be replaced by MATH 3350.

⁶ Students are encouraged to consider useful courses in Computer Science and Statistics as electives.

Economics-Statistics Joint Honours Program
2008-2009 Undergraduate Calendar, page 140

- Revisions to Program Notes

Added material
~~Deleted material~~

8.8.7 Economics-Statistics Joint Honours Program, Program Code 005E

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS TOTAL: 120 CREDIT HOURS			
<ul style="list-style-type: none"> ECON 1200 (or ECON 1210 and ECON 1220); MATH 1300¹; MATH 1500^{1,2}; MATH 1700^{1,2}; STAT 1000³; COMP 1010³ Plus 9 credit hours of electives which should include the required "Written English" course 	<ul style="list-style-type: none"> ECON 2700, ECON 2800, MATH 2202, MATH 2352, MATH 2750, STAT 2000, STAT 2400 Plus 3 credit hours of approved Economics electives⁴ 	<ul style="list-style-type: none"> ECON 3700, ECON 3800, MATH 3740 or MATH 3760, STAT 3470, STAT 3480, STAT 3490, STAT 3500, STAT 3600 Plus 3 credit hours of approved Economics electives⁴ 	<ul style="list-style-type: none"> ECON 4120, ECON 4130, STAT 4140, STAT 4520, STAT 4530, STAT 4580 Plus 12 credit hours of approved Economics electives⁴
30 HOURS	30 HOURS	30 HOURS	30 HOURS

NOTES:

¹ MATH 1310 may be taken in place of MATH 1300; MATH 1510, ~~or~~ MATH 1520 ~~or~~ MATH 1530 may be taken in place of MATH 1500; MATH 1710 ~~or~~ MATH 1730 may be taken in place of MATH 1700.

² The combination of MATH 1500¹ and MATH 1700¹ may be replaced by MATH 1690.

³ Some courses may be taken in a different year than indicated; STAT 1000, COMP 1010, MATH 2600 and ECON 3180 (or STAT 2000) may be taken in Year 2.

⁴ Of the 18 credit hours of electives in Economics in Years 2, 3 and 4, no more than 6 credit hours may be at the 2000 level or below; ECON 2530 and ECON 3180 are recommended in Year 2 or 3. The normal prerequisite for ECON 3180 is ECON 3170, which will be waived for students in this program who have completed Year 1.

English, Film, and Theatre – English

Course modification:

ENGL 3530 Special Topics in Creative Writing 1 Cr.Hrs. 3

This advanced studies course will include practical and theoretical components and will focus on a particular area of writing craft or poetics without an emphasis on end-of-term publication or production. Possible topics include prose fiction, poetry, memoir, dramaturgy and screenwriting.

Prerequisites: [a grade of "C" or better in ENGL 2760 (004.276)] and written consent of instructor, based on a sample of the student's work. Samples of writing (with name, address and telephone number) are to be submitted at the department general office at least two months prior to the start of the course. Enrolment for this course will be limited. NOTE: The content of this course will vary from year to year. As the course content will vary from year to year, students may take this course more than once for credit.

NET CHANGE IN CREDIT HOURS:

0 HOURS

Program modification:

Revisions to the Honours Single Program and the English course descriptions, B-Introductory course information.

Department of English, Film, and Theatre - English
2008-2009 Undergraduate Calendar, page 144

- Revisions to the Honours Single Program
- Revisions to B-Introductory Course Information

Added material
Deleted material

English, Film, and Theatre, Department Code: 004			
8.9.3 English, Program Code: 004			
UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
HONOURS SINGLE ^{1, 5, 6, 8}			
ENGL 1200 or ENGL 1300 (or the former 004.126) or both ENGL 1310 and ENGL 1340	<ul style="list-style-type: none">• ENGL 2640 (in Year 2)• 24 credit hours of literature prior to 1900⁵, of which 12 credit hours is to be in literature prior to 1700 selected from the following English courses: ENGL 2070, ENGL 2080, ENGL 2090, ENGL 3000, ENGL 3010, ENGL 3020, ENGL 3030, ENGL 3050, ENGL 3080, ENGL 3090, ENGL 3100² — adding footnote• 6 credit hours in Canadian literature, selected from the following English courses: ENGL 2270, ENGL 3270⁷• 12 credit hours in other literature after 1900, selected from the following English courses: ENGL 2160, ENGL 2180, ENGL 2830, ENGL 2840, ENGL 3980, ENGL 3990⁷• 9 credit hours in other English courses [of the credit hours listed above, at least 9 credit hours must be at the 3000 level].• 9 credit hours in Honours seminars (4000 level) in Years 3 and 4. Honours seminars that are double-numbered with a graduate course will be limited to fourth-year Honours students.• 24 credit hours in ancillary options		
NOTES:			
¹ See "(B) Introductory Courses" below for restrictions on the number of courses numbered at the 1000 level that may be taken for credit.			
² Students may offer up to 6 credit hours in Film Studies courses, with the exception of FILM 1290 and FILM 1310 (or the former FILM 1300), toward both the 3-year and the 4-year Major in English. Any Film Studies course so applied may not also be offered toward a Minor in Film Studies.			
³ Film Studies course FILM 2280 may be used as an English course to satisfy the English course requirements. If it is used as such, it may not also be applied to a minor in Film Studies or as an ancillary option in Honours.			
⁴ Credit in ENGL 2000 may be offered toward the 48 hours in general courses required for a Major (Advanced).			
⁵ Students may offer up to 6 credit hours of literature in translation courses (ENGL 2490, CLAS 3610, CLAS 3620, ICEL 3320, ICEL 3330) to satisfy requirements for a General Major, Advanced Major, Single Honours or Double Honours. Students may offer up to 3 credit hours of literature in translation courses to satisfy the "literature prior to 1900" requirement for a General Major, Advanced Major, Single Honours or Double Honours. Students may not offer literature in translation courses to satisfy the requirements for a Minor.			
⁶ Film and Theatre courses, other than Introductory (1000 level), may be used for credit towards an Honours program (Single).			
⁷ Certain courses that vary in content from year to year, such as Honours seminars and Special Topics courses, may also satisfy this requirement, as determined by the Department.			
⁸ Ancillary options are courses taken from outside the Honours field of study.			

B – Introductory Courses

A grade of "C" or better in one of: ENGL 1200 (004.120), ENGL 1201 (004.120), ENGL 1300 (004.130), ENGL 1301 (004.130), or in both ENGL 1310 (004.131) and ENGL 1340 (004.134), or the former 004.126 is normally required for entry to a Major or Minor program in English and is the normal prerequisite for any English course beyond the introductory level. For admission to Honours courses or the Honours program see Honours Program above. Up to 12 hours of courses at the 1000 level may be taken for credit but students may offer only 6 hours of courses numbered at the 1000 level for credit in the minimum number of hours required for a three-year Major, a four-year Major, or a Minor in English. If 9 or 12 hours are taken, however, they will be included in the total number of hours a student is allowed to take in the combined Major and Minor. In the four-year Major only, a student may offer 6, 9 or 12 hours of courses numbered at the 1000 level courses for credit in the minimum number of hours required.

German and Slavic Studies – German

Course introductions:

GRMN 1300 Masterpieces of German Literature in English Translation Cr.Hrs. 3 +3

Language of instruction: English. The course introduces students to representative works (prose, poetry, and drama) by German-speaking writers such as Goethe, Kleist, Thomas Mann, Kafka, and Rilke, with an emphasis on the ages of Classicism, Romanticism, and Modernism. Stresses the development of English reading and writing skills. The course is designed for students who have little or no prior knowledge of German literature.

GRMN 3262 Representations of the Holocaust in English Translation Cr. Hrs. 3 +3

Language of instruction: English. This course will focus on the literary rendering, including film versions and German memorial culture, of the Holocaust experience by authors from the German-speaking countries, such as Anna Seghers, Jurek Becker, Paul Celan, Max Frisch, Peter Weiss, Ruth Klüger, W.G. Sebald, and others. Students may not hold credit for both GRMN 3262 and GRMN 3260. Prerequisite: [a grade of "C" or better in a minimum of 30 credit hours of university level coursework] or written consent of department head.

GRMN 3282 Sex, Gender and Cultural Politics in the German-Speaking World in English Translation Cr.Hrs. 3 +3

Language of instruction: English. Explores a wide range of literary and cultural texts that deal with sex and gender in the German-speaking world. Discussion will address topics such as representation of women and men in literature and the social and historical climate in which the literature was and is produced. Students may not hold credit for both GRMN 3282 and GRMN 3280. Prerequisite: [a grade of "C" or better in a minimum of 30 credit hours of university level coursework] or written consent of department head.

Course modifications:

GRMN 3260 Representations of the Holocaust Cr.Hrs. 3

Language of instruction: German. This course will focus on the literary rendering, including film versions and German memorial culture, of the Holocaust experience by authors from the German-speaking countries, such as Anna Seghers, Jurek Becker, Paul Celan, Max Frisch, Peter Weiss, Ruth Klüger, W.G. Sebald, and others. Students may not hold credit for both GRMN 3260 and GRMN 3262. Prerequisite: [a grade of "C" or better in GRMN 2140] or written consent of department head.

GRMN 3280 Sex, Gender and Cultural Politics in the German-Speaking World Cr.Hrs. 3

Language of instruction: German. Explores a wide range of literary and cultural texts that deal with sex and gender in the German-speaking world. Discussion will address topics such as representation of women and men in literature and the social and historical climate in which the literature was and is produced. Students may not hold credit for both GRMN 3280 and GRMN 3282. Prerequisite: [a grade of "C" or better in GRMN 2140] or written consent of department head.

Polish

In the Polish Minor, POLS 2530 and POL 2690 are being added to the optional courses in Year 3.

Slavic Studies - Polish

2008-2009 Undergraduate Calendar, page 169

- Revisions to the Polish Minor Program

Added material

~~Deleted material~~

8.11.13 Polish, Program Code: 052P

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
POLISH MINOR ¹ TOTAL: 18 CREDIT HOURS			
POL 1890	POL 2890	6 credit hours from the following Polish/Slavic Studies courses: POL 2320, <u>POL 2530</u> , <u>POL 2690</u> , POL 3890, SLAV 2260, SLAV 2270	

NOTES:

¹ Students entering university with a knowledge of Polish, but without Grade 12 standing, may be granted written permission by the department head to enter POL 2890.

Russian

Course deletion:

RUSN 2770 Masterpieces of Russian Literature in Translation Cr.Hrs. 3 -3

Course introduction:

RUSN 1400 Masterpieces of Russian Literature in Translation Cr.Hrs. 3 +3

An introduction to representative works by major Russian writers, with emphasis on key paradigms in literary and socio-political thinking in Russia. Early 19th century to the present. The course is designed for students who have little or no prior knowledge of Russian literature. Lectures and readings in English. Students may not hold credit for both RUSN 1400 and the former RUSN 2770.

Program modification:

RUSN 1400 is being added and RUSN 2770 is being deleted from the listing of literature courses in the Russian Program Notes.

NET CHANGE IN CREDIT HOURS: +9 HOURS

- Revisions to the Russian Program Notes

Added material

~~Deleted material~~

8.11.7 Russian, Program Code: 052R

NOTES:

With written consent from the department head, courses offered by other departments may be approved for credit.

The following courses count as language courses: RUSN 1300, RUSN 1330, RUSN 2630, RUSN 2810, RUSN 2820, RUSN 3200, RUSN 3210, RUSN 3220.

The following courses count as literature courses: ~~RUSN 1400~~ RUSN 2280, RUSN 2290, RUSN 2350, RUSN 2740, RUSN 2750, RUSN 2760, ~~RUSN 2770~~, RUSN 3330, RUSN 3580, RUSN 3770, RUSN 3780, RUSN 3790, RUSN 3900, RUSN 3980, SLAV 2240, SLAV 2250, SLAV 2260, SLAV 2270, SLAV 3520, SLAV 3920.

Global Political Economy

Program modification:

It is proposed that SOC 3470 Political Sociology be replaced by SOC 3380 Power, Politics and the Welfare State and that the list of suggested electives is being revised to add: ASIA 2080 South Asian Civilization (3) and SOC 3380 Power, Politics and the Welfare State (3) and to flag ASIA 2070 South Asian Civilization (6) and SOC 3470 Political Sociology (3) as no longer offered.

Global Political Economy
2008-2009 Undergraduate Calendar, pages 170-171

- Revisions to General Major and Advanced Major
- Revisions to the List of Suggested Electives

Added material
 Deleted material

8.12.2 Global Political Economy, Program Code: 157

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
GENERAL MAJOR TOTAL: 60 CREDIT HOURS			
<ul style="list-style-type: none"> • Anthropology: ANTH 2390; ANTH 3320 or Sociology SOC 3810 • Economics: ECON 1200 or ECON 1210 and ECON 1220; ECON 2540; ECON 2550; ECON 2630 or ECON 3390 • History: 12 credit hours from: HIST 1370, HIST 1380, HIST 1500, HIST 2380, HIST 2720 • Political Studies: 6 credit hours from: POLS 1000, POLS 1010, POLS 1040, POLS 1070, POLS 1500; POLS 2040 • Sociology: SOC 1200; SOC 3380 SOC 3470 or SOC 3690 or SOC 3838 or SOC 3840 or SOC 3870; SOC 3810 or Anthropology ANTH 3320 			
ADVANCED MAJOR TOTAL: 78 CREDIT HOURS			
<ul style="list-style-type: none"> • Anthropology: ANTH 2390; ANTH 3320 or Sociology SOC 3810; ANTH 3750 • Economics: ECON 1200 or ECON 1210 and ECON 1220; ECON 2540; ECON 2550; ECON 2630 or ECON 3390 • Global Political Economy: GPE 2700; GPE 4700 • History: 12 credit hours from: HIST 1370, HIST 1380, HIST 1500, HIST 2380, HIST 2720 • Political Studies: 6 credit hours from: POLS 1000, POLS 1010, POLS 1040, POLS 1070, POLS 1500; POLS 3220; POLS 3250 or POLS 3840 • Sociology: SOC 1200; SOC 2290; SOC 3380 SOC 3470 or SOC 3690 or SOC 3838 or SOC 3840 or SOC 3870; SOC 3810 or Anthropology ANTH 3320 			

List of Courses for Global Political Economy

See the departmental Calendar section for full course descriptions.

Anthropology

ANTH 2390	Social Organization in Cross-Cultural Perspective (B)	6
ANTH 3320	Women in Cross-Cultural Perspective (B)	3
ANTH 3750	Globalization and the World-System (B)	3

Economics

ECON 1200	Principles of Economics	6
ECON 1210	Introduction to Canadian Economic Issues and Policies	3
ECON 1220	Introduction to Global and Environmental Economic Issues and Policies	3
ECON 2540	Political Economy 1: Production and Distribution	3
ECON 2550	Political Economy 2: Economic Growth and Fluctuations in a Global Economic Environment	3
ECON 2630	An Introduction to the World's Economies	6
ECON 3390	Development Economics	6

Global Political Economy

GPE 2700	Perspectives on Global Political Economy	3
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GPE 4700	Studies in Global Political Economy	6
History		
HIST 1370	An Introduction to Modern World History: 1500-1800 (M)	3
HIST 1380	An Introduction to Modern World History: 1800 - Present (M)	3
HIST 1500	An Introduction to Modern World History: 1500 - Present (M)	6
HIST 2380	The Twentieth-Century World (C,M)	6
HIST 2720	The World Since 1945 (C,M)	6
Political Studies		
POLS 1000	Democracy and Development	3
POLS 1010	Political Ideas and Ideologies	3
POLS 1040	Global Political Issues	3
POLS 1070	Law, Politics, and Power in Canada	3
POLS 1500	Introduction to Politics	6
POLS 2040	Introduction to International Relations	6
POLS 2530*	Elements of Foreign Policy	6
POLS 3220	Globalization and the World Economy	3

POLS 3250	International Political Economy	3
019.383*	The Politics of International Economic Relations	6
Sociology		
SOC 1200	Introduction to Sociology	6
SOC 2290	Introduction to Research Methods	6
<u>SOC 3380</u>	<u>Power, Politics and the Welfare State</u>	<u>3</u>
SOC 3470*	Political Sociology	3
SOC 3690	Sociology of the Developing Societies	3
SOC 3810	Sociological Perspectives on Gender and Sexuality	3
SOC 3838	Ecology and Society	3
SOC 3840	Community and Social Reconstruction	3
SOC 3870	Social Inequality	3

List of Suggested Electives

Faculty of Arts

Anthropology

ANTH 1220	Cultural Anthropology (A)	3
ANTH 1520	Critical Cultural Anthropology (A)	3
ANTH 2460	Peasantry in a Changing World (B)	3
ANTH 2510	Anthropology of Economic Systems (B)	3
ANTH 2530	Anthropology of Political Systems (B)	3
ANTH 2570	Urban Anthropology (B)	3
ANTH 3320	Women in Cross-Cultural Perspective (B)	3
ANTH 3380	Anthropology and Contemporary Social Issues (B)	3
076.244*	Peasant Society and Culture (B)	3

Asian Studies

ASIA 1420	Asian Civilizations to 1500 (Cross-listed with History HIST 1420)	3
ASIA 1430	Asian Civilizations Since 1500 (Cross-listed with History HIST 1430)	3
ASIA 2070*	South Asian Civilization	6
<u>ASIA 2080</u>	<u>South Asian Civilization</u>	<u>3</u>
150.211*	East Asian Civilization	6

Economics

ECON 2420	Economics of the Labour Process and Labour Relations (Cross-listed with Labour Studies LABR 2420)	3
ECON 2490	Economic Accounting	3
ECON 2560	Corporations in the Global Economy	3
ECON 2630	An Introduction to the World's Economies	6
ECON 3390	Development Economics	6
ECON 3660	Economic Ideas and Social Institutions	6
ECON 3710	Sustainable Development: Issues and Policy	3
ECON 4510	Economy and State in a Modern Period: Western Europe and North America	6

History

HIST 2670	History of Capitalism (M)	3
HIST 2680	History of Socialism from the French Revolution to the Present (M)	3
HIST 2710	Women in History (C)	6
HIST 3580	Topics in Recent World History 1 (M)	3
HIST 3590	Topics in Recent World History 2 (M)	3
HIST 4010	Imperialism, Decolonization and Neo-Colonialism, 1700 to the Present (C,M)	6
HIST 4320	Studies in World History since 1945 (C,M)	3
011.341*	The British Empire and Commonwealth Since 1815 (C)	6

Labour Studies

LABR 1260	Working for a Living	3
LABR 1270*	Introduction to the Political Economy of Labour	3
LABR 1290	Introduction to the Canadian Labour Movement	3
LABR 2100	Political Economy of Labour	3
LABR 2300	Workers, Employers and the State	3
LABR 2420	Economics of the Labour Process and Labour Relations (Cross-listed with Economics ECON 2420)	6
LABR 3090	Globalization and Labour	3

Political Studies

POLS 2040	Introduction to International Relations	6
POLS 2070	Introduction to Canadian Government	6
POLS 2530	Elements of Foreign Policy	6
POLS 3200	International Security and Conflict Management	6
POLS 3330	Politics of the European Union	3
POLS 3810	Introduction to Marxism	3
POLS 3880	Comparative Foreign Policy	3
POLS 4530	Regionalism in International Politics	3
POLS 4660	The State in the Economy	6
019.156*	Introduction to Canadian Government	6
019.273*	International Conflict Resolution	6

Sociology

SOC 2480	Population Problems	3
<u>SOC 3380</u>	<u>Power, Politics and the Welfare State</u>	<u>3</u>
SOC 3470*	Political Sociology	3
SOC 3690	Sociology of the Developing Societies	3
SOC 3810	Sociological Perspectives on Gender and Sexuality	3
SOC 3838	Ecology and Society	3
SOC 3840	Community and Social Reconstruction	3

SOC 3870 Social Inequality	3
Clayton H. Riddell Faculty of Environment, Earth, and Resources	
Geography	
GEOG 1280 Introductory Human Geography	3
GEOG 2210 Economic Geography	6
GEOG 3590 Geography of Developing Countries	6
GEOG 3800 Geography of Transportation Development	3
GEOG 4640 Models in Urban Geography	3
*indicates course no longer offered.	

History

Course deletions:

HIST 1410 Asian Civilizations (B) Cr.Hrs. 6	-6
HIST 2690 The Common People in Industrial Society (G) Cr.Hrs. 6	-6
HIST 3060 German and German Jewish History 1780-1933 (E) Cr.Hrs. 3	-3
HIST 3930 Minorities in the Modern World (M) Cr.Hrs. 3	-3
HIST 3960 China, 1911 to the Present (B) Cr.Hrs. 3	-3
HIST 4940 Revolutionary China: A Century of Upheaval, 1870 to the Present (B) Cr.Hrs. 6	-6

Course introductions:

HIST 2654 History of the People's Republic of China, 1949-Present (B) Cr.Hrs. 3 +3
This course examines the history of the People's Republic of China from its founding in 1949 through the present day. The course considers continuity and change between the Maoist and post-1976 periods as well as changing meanings of socialism and their impact on state power and social orders.

HIST 2750 History of the United States from 1607 to 1877 (A) Cr.Hrs. 3 +3
A survey of the development of the American people and their institutions from Colonial times to Reconstruction. Students may not hold credit for HIST 2750 and any of: HIST 2230 (011.223) or HIST 2041 (011.204).

HIST 3062 German and German-Jewish History, 1618 to the Present (E) Cr.Hrs. 6 +6
The history of Germany from 1618 to the present with a focus on the experience of German Jewry. Students may not hold credit for HIST 3062 and any of: HIST 3064 or HIST 3066 or the former HIST 3060 (011.306). Prerequisite: [a grade of "C" or better in six credit hours of history] or written consent of department head.

HIST 3064 German and German-Jewish History, 1618-1900 (E) Cr.Hrs. 3 +3
The history of Germany from 1618 to 1900 with a focus on the experience of German Jewry. Students may not hold credit for HIST 3064 and any of: HIST 3062 or the former HIST 3060 (011.306). Prerequisite: [a grade of "C" or better in six credit hours of history] or written consent of department head.

HIST 3066 German and German-Jewish History, 1900 to the Present (E) Cr.Hrs. 3 +3
The history of Germany from 1900 to the present with a focus on the experience of German Jewry. Students may not hold credit for both HIST 3066 and HIST 3062. Prerequisite: [a grade of "C" or better in six credit hours of history] or written consent of department head.

HIST 4680 Social History of Health and Disease in Modern Canada (C) Cr.Hrs. 6 +6

This course explores the history of health and health care in Canada, with a focus on the late 19th and 20th century. Topics will include colonization, infectious disease, and Aboriginal health; the evolution of medical and nursing professions; the emergence of the modern hospital; mental health, psychiatry and the asylum; cancer; alternative therapies; childbirth; health and old age; and health and the state. Analytical categories of gender, race, ethnicity, class, and sexuality will run throughout the material. Prerequisite: written consent of department head.

HIST 4660 History of Health and Disease (G) Cr.Hrs. 6 +6

Introduction to some of the principal issues and approaches in the history of health and disease. It is not meant to be a strictly chronological survey. Topics and themes may include the development of nursing and medical professions; transformation of the hospital; mental health; alternative therapies; colonization, infectious disease and aboriginal health; and health and the state. Prerequisite: written consent of department head.

Course modifications:

HIST 1420 Asian Civilizations to 1500 (B) (3)

(Formerly 011.142) A study of major themes in the history and culture of China and Japan, the Indian subcontinent and Southeast Asia from ancient times to around 1500. Also offered as Asian Studies ASIA 1420. May not be held with ASIA 1420 (150.142) or the former HIST 1410 (011.141).

HIST 1430 Asian Civilizations from 1500 (B) (3)

(Formerly 011.143) A study of major themes in the history and culture of China and Japan, the Indian subcontinent and Southeast Asia in modern times. Also offered as Asian Studies ASIA 1430 (150.143). May not be held with ASIA 1430 (150.143) or the former ASIA 1410 (011.141).

HIST 2230 History of the United States from 1607 (A) (6)

(Formerly 011.223) A survey of the development of the American people and their institutions from Colonial times to the present day. Students may not hold credit for HIST 2230 (011.223) and any of: HIST 2750 or HIST 2760 (011.276) or HIST 2761 (011.276).

NET CHANGE IN CREDIT HOURS:

+3 HOURS

Labour Studies

Course introduction:

LABR 3080 Labour and Community Organizing Cr.Hrs. 3

+3

This course examines the theory and practice of collaborative community and labour organizing, with particular emphasis on Latin America, to identify the strengths and limitations of this approach for reviving unions, protecting workers' rights and advancing social justice. Prerequisite: [a grade of "C" or better in LABR 1260 (the former LABR 1270 or 153.127) and LABR 1290 (153.129) (the former 153.128)] or written consent of the Labour Studies coordinator.

NET CHANGE IN CREDIT HOURS:

+3 HOURS

Modification to the list of electives to add SOC 3380 Power, Politics and the Welfare State (3) and mark HIST 2690 The Common People in Industrial Society (G)(6) and SOC 3470 Political Sociology (3) as no longer offered.

Labour Studies
2008-2009 Undergraduate Calendar, pages 180-181

- Revisions to the List of Electives

Added material

Deleted material

List of Electives

The following courses may be selected to fulfill the requirements for a degree in Labour Studies (see the table above for details). Other courses might be chosen for this purpose, in accordance with students' individual interests, but require advance permission from the Labour Studies coordinator. Students are responsible for ensuring that all prerequisites have been met. In the following list (H) indicates an Honours course.

Faculty of Arts			Political Studies		
Economics			POLS 3470	Canadian Public Management	3
ECON 2280	Social Welfare and Human Resources	6	POLS 3570	Administrative Theory in the Public Sector	3
ECON 2350	Community Economic Development	3	POLS 3810	Introduction to Marxism	3
ECON 2360	Women in the Canadian Economy	6	POLS 4370	Comparative Public Administration (H)	3
ECON 2500	Labour and Technology (same as Labour Studies LABR 2450)	3	POLS 4570*	Public Organizational Management (H)	6
ECON 3170	Introduction to Quantitative Methods in Economics	3	POLS 4660	The State in the Economy (H)	6
ECON 3300	Canadian Economic History	6	019.487*	Government and Public Sector Unionism (H)	3
ECON 3360	Labour Economics	6	Psychology		
ECON 3510	Industrial Relations (same as Labour Studies LABR 3510)	6	PSYC 3510	Organizational Psychology	3
ECON 3660	Economic Ideas and Social Institutions	6	PSYC 3600	Environmental Psychology	3
History			Sociology		
HIST 2670	History of Capitalism (M)	3	SOC 2290	Introduction to Research Methods	6
HIST 2671	Histoire du capitalisme (M)	3	SOC 3370	Sociology of Work	3
HIST 2680	A History of Socialism from the French Revolution to the Present (M)	3	SOC 3371	Sociologie du travail (CUSB)	3
HIST 2690*	The Common People in Industrial Society (G)	6	SOC 3380	<u>Power, Politics and the Welfare State</u>	<u>3</u>
HIST 2710	Women in History (G)	6	SOC 3470*	Political Sociology	3
HIST 2720	The World Since 1945 (G,M)	6	SOC 3471	Sociologie politique (CUSB)	3
HIST 2970	Modern Canada: 1921 to the Present (C)	6	SOC 3820	Qualitative and Historical Methods in Sociology	3
HIST 2971	Le Canada moderne: de 1921 à nos jours (C) (CUSB)	6	SOC 3870	Social Inequality	3
HIST 3050	Canada since 1945 (C)	6	SOC 3871	Inégalités sociales (CUSB)	3
HIST 3210	The History of Popular Radicalism in the Twentieth Century (M)	6	Women's and Gender Studies		
HIST 3570	History of Women in Canada (C)	6	WOMN 2500	Race, Class and Sexuality	3
HIST 3700	History of Working People and Labour Movements 1700 to the Present (G) (same as Labour Studies LABR 3700)	6	WOMN 3550	Feminist Community Organizing: Theories and Practices	3
HIST 3730	A History of Western Canada (C)	6	I.H. Asper School of Business (Faculty of Management)		
HIST 3800	History of Winnipeg from 1870-2000 (C)	3	Business Administration		
HIST 4030	The History of Communism and Socialism since 1945 (M) (H)	6	GMGT 2030	Administrative Theory	3
Native Studies			GMGT 2080	Introduction to Management and Organization Theory	3
NATV 3320*	Aboriginal Organizations	3	GMGT 3030	Contemporary Social Issues in Business	3
Philosophy			HRIR 2440	Human Resource Management	3
PHIL 2290	Ethics and Society	6	HRIR 3430	Selected Topics in Industrial Relations	3
PHIL 2830	Business Ethics	3	HRIR 3450	Labour and Employment Relations (or the former 027.341)	3
PHIL 3710	Critiques of Contemporary Society	6	HRIR 4420	Compensation	3
Interdepartmental Courses			HRIR 4480	Collective Bargaining and Administration	3
IDM 3000	Aboriginal Business Context: Influences and Impacts	3	HRIR 4520	Comparative Industrial Relations and Human Resource Management	3
IDM 4090	Aboriginal Business Leadership	3			

* No longer offered

For course descriptions, see departmental listings.

Native Studies

Course modifications:

NATV 2020 The Métis of Canada Cr.Hrs. 3
(Formerly 032.202) A history of the Métis of Canada.

NATV 2220 Native Societies and the Political Process Cr.Hrs. 3
(Formerly 032.222) An analysis of contemporary Canadian (and U. S.) political and administrative processes as they affect Native people. Depending on instructor, this course may have a weekend field trip. Contact the Department of Native Studies for details.

NATV 3240 Native Medicine and Health Cr.Hrs. 3
(Formerly 032.324) The health, disease, and medical practices of North American Native peoples. A survey of the health and health care of North American Native people from pre-contact to modern times. Special attention will be paid to traditional concepts of health and healing practices.

NET CHANGE IN CREDIT HOURS: 0 HOURS

Political Studies

Course deletion:

POLS 3610 Political Metaphors Cr.Hrs. 3 -3

Course introductions:

POLS 3710 Distributive Justice Cr.Hrs. 3 +3
A study of the question of whether, and to what extent, inequalities of various kinds are compatible with the demands of both justice and community. This course examines contending answers to the question by investigating classical and/or contemporary theories of distributive justice. Prerequisite: a grade of "C" or better in POLS 2510 (019.251) or POLS 2511 (019.251).

POLS 4710 Political Theory and the Family Cr.Hrs. 3 +3
An examination of the normative aspects of the relations between children, families and the state. Prerequisite: written consent of instructor or department head.

POLS 4140 Canadian Political Ideas Cr.Hrs. 3 +3
An examination of the ideas that underlie Canadian politics. What are the values at the centre of political movements in Canada and where do they come from? How have these values changed over time and why? We will attempt to answer these questions by exploring the development of Canadian political ideas as well as our current ideological context in Canada. Effort will be made to reflect on ideological debate on contemporary issues of the day. Prerequisite: written consent of instructor or department head.

NET CHANGE IN CREDIT HOURS: +6 HOURS

Modification to the Program Notes to add POLS 3710 and POLS 4710 to footnote 1 and delete POLS 3610.

Department of Political Studies
2008-2009 Undergraduate Calendar, pages 196-197

- Revisions to the Honours Single Program

Added material

~~Deleted material~~

8.23.3 Political Studies, Department Code: 019

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
HONOURS SINGLE^{1,3}			
6 credit hours in Political Studies courses numbered at or above the 1000 level	<ul style="list-style-type: none"> 18 credit hours from POLS 2000, POLS 2040, POLS 2070, POLS 2510 12 credit hours in ancillary options 	<ul style="list-style-type: none"> POLS 3950 15 credit hours in Political Studies courses numbered at the 3000 level² 6 credit hours in ancillary options 	<ul style="list-style-type: none"> 18 credit hours in Political Studies Honours courses numbered at the 4000 level 6 credit hours in ancillary options
HONOURS DOUBLE^{1,3}			
6 credit hours in Political Studies courses numbered at or above the 1000 level	<ul style="list-style-type: none"> 12 credit hours from POLS 2000, POLS 2040, POLS 2070, POLS 2510 12 credit hours in other Honours field 6 credit hours in ancillary options 	<ul style="list-style-type: none"> 12 credit hours in Political Studies courses numbered at the 3000 level² an additional 12 or 18 credit hours depending on other Honours field 	<ul style="list-style-type: none"> 12 credit hours in Political Studies Honours courses numbered at the 4000 level 12 credit hours in other Honours field

NOTES:

¹ A student must include at least six credit hours in political theory (POLS 2510, ~~POLS 3210~~ POLS 3240, POLS 3510, POLS 3600, ~~POLS 3640~~, POLS 3810, ~~POLS 4710~~ POLS 4510, POLS 4610).

² A student in Single or Double Honours may, with written permission of the department head, substitute: six credit hours in Honours courses numbered at the 4000-level in place of six credit hours numbered at the 3000-level.

³ Ancillary options are courses taken from outside the Honours field of study.

Psychology

Course introduction:

PSYC 3130 Introduction to Health Psychology Cr.Hrs. 3

+3

This course offers a survey of psychological issues in health and illness. Major topics will include the biopsychosocial approach, mental models of illness, pain, stress and coping, health-damaging and health-promoting behaviours, and psychological issues in medical care. Students may not hold credit for PSYC 3130 and any of: PSYC 3131 or PSYC 3530 when titled "Health Psychology." Prerequisite: [a grade of "C" or better in PSYC 1200 (017.120) or PSYC 1201 (017.120)] or [a grade of "C" or better in both PSYC 1211 (017.121) and PSYC 1221 (017.122)].

NET CHANGE IN CREDIT HOURS:

+3 HOURS

Sociology

Course deletions:

SOC 3760 Criminology Field Experience Cr.Hrs. 6

-6

SOC 3470 Political Sociology Cr.Hrs. 3

-3

Course introductions:

SOC 3860 Genocide, Crime and Society Cr.Hrs. 3

+3

A critical sociological and criminological examination of comparative genocide studies. Emphasis is placed on the utility of sociological and criminological theoretical frameworks for understanding and explaining genocide, as well as the conceptual and moral failings of criminology and sociology in the face of genocide. Students may not hold credit for both SOC 3860 and SOC 3740 (077.374) when titled "Genocide." Prerequisite: [a grade of "C" or better in SOC 1200 (077.120) or SOC 1201 (077.120)] or [a grade of "C" or better in both SOC 1211 (077.121) and SOC 1221 (077.122)].

SOC 3100 Practicum in Criminological/Sociological Research Cr.Hrs. 6

+6

This course is designed to develop students' research skills and experience through placement in a criminal justice or other social service agency having a mandate relevant to the study of sociology. The course consists of supervised work within the agency and classroom instruction, culminating in the production of a research report. Enrolment is competitive and special advance permission is required to register. To be considered for admission, students must complete an application form (available from the Department of Sociology website) by the last day of April preceding the Fall term in which the student intends to take the course. Students may not hold credit for both SOC 3100 and the former SOC 3760 (077.376). Prerequisite: written consent of department head.

SOC 3380 Power, Politics and the Welfare State Cr.Hrs. 3

+3

A critical evaluation of sociological theory and research focusing on power and politics in society. Topics covered include: the dimensions of power (economic, political, ideological), classes and class conflict, political socialization, the origin and nature of the state, and the welfare state. Students may not hold credit for SOC 3380 and any of: SOC 3471 (077.347) or the former SOC 3470 (077.347). Prerequisite: [a grade of "C" or better in SOC 2220 (077.222) or SOC 2221 (077.222)] or written consent of department head.

Course modifications:

SOC 3330 Origins of Sociological Thought Cr.Hrs. 3

(Formerly 077.333) A systematic introduction to sociological thought from ancient philosophy to the middle of the 19th century. Emphasis is placed on social thought that is to become the foundations of sociological theory. Students may not hold credit for both SOC 3330 (077.333) and SOC 3331 (077.333). Prerequisite: [a grade of "C" or better in SOC 2220 (077.222) or SOC 2221 (077.222)] or written consent of department head.

SOC 3350 Feminism and Sociological Theory Cr.Hrs. 3

(Formerly 077.335) A critical examination of how gender has been addressed in classical and contemporary sociological theories, with consideration of how sociological inquiry is being transformed through feminist theory and practice. Prerequisite: [a grade of "C" or better in SOC 2220 (077.222) or SOC 2221 (077.222)] or written consent of department head.

SOC 3360 Theories in Social Psychology Cr.Hrs. 3

(Formerly 077.336) A review of the predominant theoretical perspectives currently utilized in social psychology in relation to contemporary sociological concerns. Prerequisite: [a grade of "C" or better in SOC 2220 (077.222) or SOC 2221 (077.222)] or written consent of department head.

SOC 3390 Contemporary Sociological Theory Cr.Hrs. 3

(Formerly 077.339) A systematic comparison of contemporary sociological theories. Emphasis will be placed on the development of competing schools in modern sociology, highlighting the contributions

of major theorists. Students may not hold credit for both SOC 3390 (077.339) and SOC 3391 (077.339). Prerequisite: [a grade of "C" or better in SOC 2220 (077.222) or SOC 2221 (077.222)] or written consent of department head.

NET CHANGE IN CREDIT HOURS:

+3 HOURS

Program modification:

General Major Sociology, General Major Criminology, Advanced Major Sociology, Honours Single and Honours Double Programs will be modified to reflect that the requirement of SOC 3760 will be replaced by SOC 3100 and the requirement for SOC 3470 will be replaced by SOC 3380.

Sociology
2008-2009 Undergraduate Calendar, page 210

- Revisions to the General Major Sociology, General Major Criminology, Advanced Major Sociology, Honours Single and Honours Double Programs

Added material
Deleted material

8.26.3 Sociology, Department Code: 077

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
GENERAL MAJOR SOCIOLOGY TOTAL: 30 CREDIT HOURS			
SOC 1200 or SOC 1211 and SOC 1221	<ul style="list-style-type: none"> • SOC 2220 • SOC 2290 • one of SOC 3330, SOC 3350, SOC 3360, SOC 3390, SOC 3380 SOC 3470 • 12 credit hours in Sociology courses numbered at the 2000 or 3000 level 		
GENERAL MAJOR CRIMINOLOGY TOTAL: 30 CREDIT HOURS			
SOC 1200 or SOC 1211 and SOC 1221	SOC 2290, SOC 2510, SOC 2610	12 credit hours from SOC 3700, SOC 3710, SOC 3720, SOC 3740, SOC 3760, SOC 3770, SOC 3780, SOC 3790, SOC 3800, SOC 3830, SOC 3850, SOC 4520	
ADVANCED MAJOR SOCIOLOGY (NOT CURRENTLY OFFERED) TOTAL: 48 CREDIT HOURS			
SOC 1200 or SOC 1211 and SOC 1221	<ul style="list-style-type: none"> • SOC 2220, SOC 2290, SOC 2330 • one of SOC 2390, SOC 3370, SOC 3810, SOC 3870 • one of SOC 3330, SOC 3350, SOC 3360, SOC 3390, SOC 3380 SOC 3470 • 6 credit hours in Sociology courses numbered at the 2000 or 3000 level 		18 credit hours in Sociology courses numbered at the 2000 or 3000 level
HONOURS SINGLE ¹			
SOC 1200 or SOC 1211 and SOC 1221	<ul style="list-style-type: none"> • SOC 2010, SOC 2220 and SOC 2290 • 6 credit hours in Sociology • 12 credit hours in ancillary options 	<ul style="list-style-type: none"> • 9 credit hours from SOC 3330, SOC 3350, SOC 3360, SOC 3390, SOC 3380 SOC 3470 • 9 credit hours in Sociology courses numbered at the 2000 or 3000 level • 12 credit hours in ancillary options 	<ul style="list-style-type: none"> • SOC 4450, SOC 4460, SOC 4560, SOC 4570 and SOC 4580 • 6 credit hours in ancillary options
HONOURS DOUBLE ¹			
SOC 1200 or SOC 1211 and SOC 1221	<ul style="list-style-type: none"> • SOC 2010, SOC 2220 and SOC 2290 • At least 36 credit hours in other Honours field • At least 6 credit hours in ancillary options 	9 credit hours from SOC 3330, SOC 3350, SOC 3360, SOC 3390, SOC 3380 SOC 3470	SOC 4450, SOC 4460, SOC 4560, SOC 4570 and SOC 4580
NOTE:			
¹ Ancillary options are courses taken from outside the Honours field of study.			

Women's and Gender Studies

Two courses will be added to List A: GRMN 3282 Sex, Gender and Cultural Politics in the German-Speaking World in English Translation (3) and NATV 2430 Indigenous Women's Stories (3).

Women's and Gender Studies

2008-2009 Undergraduate Calendar, pages 216-217

- Revisions to the List A

Added material

~~Deleted material~~

List A			NATV 3360	Aboriginal Women of Canada	3
Faculty of Arts			NATV 3380	Cultural Constructions of Gender in Canadian Aboriginal Societies	3
Anthropology			Philosophy		
ANTH 3320	Women in Cross-Cultural Perspective (B)	3	PHIL 3220	Feminist Philosophy	3
ANTH 3321	Femmes, société et cultures (B) (CUSB)	3	Political Studies		
ANTH 3350	Anthropology of Sex and Sexualities (B)	3	POLS 3100	Gender and Politics in Canada	3
Economics			POLS 3240	Feminist Political Theory	3
ECON 2360	Women in the Canadian Economy	6	Psychology		
French, Spanish and Italian			PSYC 2390	Psychology of Women	3
FREN 2680	Littérature féminine française (B)	3	PSYC 2400	The Psychology of Sex Differences	3
FREN 3860	Études sur Beauvoir (B)	3	Religion		
German			RLGN 2680	Women and Religion 1	3
GRMN 3282	Sex, Gender and Cultural Politics in the German- Speaking World in English Translation	3	RLGN 2690	Women and Religion 2	3
GRMN 3280	Sex, Gender and Cultural Politics in the German- Speaking World	3	Slavic Studies		
History			RUSN 2350	Russian Women's Writing from the 1950s to the Present Day	3
HIST 2710	Women in History (C)	6	RUSN 3980	Women and Russian Literature	3
HIST 3570	History of Women in Canada (C)	6	UKRN 3970	Women and Ukrainian Literature	3
HIST 3760	Problems in American History 1	3	Sociology		
	Acceptable for credit only when the topic is "Gender and Sexuality in 20th Century America".		SOC 2460	The Family	3
HIST 3810	The Family, Love and Marriage in Western Society, 1500-1800 (E)	6	SOC 2461	La famille (CUSB)	3
HIST 3811	Famille, amour et mariage dans la société occidentale, 1500-1800 (E)	6	SOC 2470	Courtship and Marriage	3
HIST 3820	The Women's Movement, 1850 to the Present (G)	6	SOC 2471	Les fréquentations et le mariage (CUSB)	3
HIST 4060	Gender History in Canada (C)	6	SOC 3770	Women, Health and Medicine	3
Native Studies			SOC 3790	Women, Crime and Social Justice	3
NATV 2430	Indigenous Women's Stories	3	SOC 3810	Sociological Perspectives on Gender and Sexuality	3
			SOC 3811	Sociologie de la sexualité et des rôles sexuels (CUSB)	3

School of Art

FAAH 2110	Women and Art	3
FAAH 4090	Seminar on Contemporary Issues in Art	3

Acceptable for credit only when the topic is "Women Artists."

Faculty of Music

MUSC 4130	History of Women in Music	3
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Faculty of Nursing

NURS 3330	Women and Health	3
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For course descriptions, see the departmental listing.

NOTE: List A courses are identified in Aurora Student with the course attribute of "Women's Studies Requirement"

History of Art

Program modification to add FAAH 3202 Contemporary Art History to List B of the Program.

History of Art

2008-2009 Undergraduate Calendar, page 218

- Revisions to List B

Added material

~~Deleted material~~

List B

School of Art

FA 2620	Writing About Art	3
FAAH 2910	Field Studies in Art History 1	3
FAAH 2920	Field Studies in Art History 2	6
FAAH 3130	Topics in Medieval Art and Architecture	3
FAAH 3140	Topics in Renaissance and Baroque Art and Architecture	3
FAAH 3150	Topics in 18th and 19th Century Art	3
FAAH 3160	Topics in 20th Century Art	3
FAAH 3170*	Contemporary Art	3
FAAH 3180	History of Photography	3
FAAH 3190	History of Ceramics	3
FAAH 3200	Art in New Media	3
<u>FAAH 3202</u>	<u>Contemporary Art History</u>	<u>3</u>
FAAH 3210	Introduction to the Theory and Criticism of Art	3
FAAH 3220	Topics in Aboriginal Art	3
FAAH 3230	Chinese Art and Architecture	3
FAAH 3240	Japanese Art and Architecture	3
FAAH 3250	Topics in Art History	3
FAAH 3260	Canadian Art and Architecture to World War II	3
FAAH 3270	Canadian Art Since World War II	3
FAAH 3280	Early Byzantine Art and Architecture	3
FAAH 3290	Later Byzantine Art and Architecture	3
FAAH 3430	Inuit Art	3
FAAH 3590	Islamic Art and Architecture	3
FAAH 3780	Twentieth Century American Art Until 1950	3
FAAH 3910	Field Studies in Art History 3	3
FAAH 3920	Field Studies in Art History 4	3
FAAH 4060	Seminar on the Theory and Criticism of Art	3
FAAH 4070	Seminar in Art History 1	3
FAAH 4080	Seminar in Art History 2	3

FAAH 4090	Seminar on Contemporary Issues in Art	3
FAAH 4710	Directed Study 1	3
FAAH 4720	Directed Study 2	3
Other		
These courses may not be used for the major or minor in History of Art		
FA 1020	Mathematics in Art	3
STDO 1200	Fundamentals of Drawing	9
STDO 1220	Basic Design	9
STDO 1260	Drawing for Non-Majors	6

* No longer offered

Mathematics

Faculty of Arts students are able to take an advanced or general major or a minor in Mathematics. Two courses MATH 1530 and MATH 1730 have been removed from the program chart and MATH 2552 replaces MATH 2550 in the program chart.

Department of Mathematics
2008-2009 Undergraduate Calendar, page 220

- Revisions to the General Major, Advanced Major and Minor Programs

Added material
~~Deleted material~~

9.5.1 Mathematics, Department Code: 136

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
GENERAL MAJOR TOTAL: 30 CREDIT HOURS			
<ul style="list-style-type: none">* one of MATH 1500, MATH 1510, MATH 1520, MATH 1530* one of MATH 1700, MATH 1710, MATH 1730; or MATH 1690* MATH 1200* one of MATH 1300, MATH 1310			
ADVANCED MAJOR TOTAL: 48 CREDIT HOURS			
<ul style="list-style-type: none">* one of MATH 1500, MATH 1510, MATH 1520, MATH 1530* one of MATH 1700, MATH 1710, MATH 1730; or MATH 1690* one of MATH 1300, MATH 1310			
MINOR TOTAL: 18 CREDIT HOURS			
<ul style="list-style-type: none">* one of MATH 1300, MATH 1310* one of MATH 1500, MATH 1510, MATH 1520, MATH 1530* one of MATH 1690, MATH 1700, MATH 1710, MATH 1730* plus a minimum of 9 credit hours from MATH 1200 and 2000 and (or) 3000 level Mathematics courses			
NOTES: ¹ MATH 2600 has a prerequisite of COMP 1010 ² MATH 2750 may be substituted for MATH 2720 and MATH 2730 For entry to either Major in Mathematics, the prerequisite is a grade of "C+" or better in six hours of Mathematics courses taken. For entry to the Minor in Mathematics, the prerequisite is a grade of "C" or better in six hours of Mathematics courses taken. A detailed listing of courses in the Department of Mathematics is available in the Calendar entries of the Faculty of Science. Equivalent Honours courses may sometimes be substituted for the courses listed above. In this way, a Major degree can be considerably strengthened. For more detailed advice students should talk to a faculty member in the department.			

9 credit hours from MATH 2400, MATH 2450, MATH 2500, ~~MATH 2550~~, ~~MATH 2552~~, MATH 2600¹, MATH 2800, or any 3000 or 4000 level Mathematics course

MATH 3300, MATH 3310, MATH 3740
15 credit hours from MATH 2202, MATH 2400, MATH 2450, MATH 2500, ~~MATH 2550~~, MATH 2600¹, MATH 2800, or any 3000 or 4000 level Mathematics course

Minor Programs Offered by Other Faculties and Schools

The Faculty will allow an Arts student to declare a minor offered by other Faculties and Schools providing the minor consists of a minimum of 18 credit hours putting the Faculty in line with the procedure in the Faculty of Science.

Faculty of Engineering

Course introduction:

ENG 1900 Occupational Health and Safety Awareness Cr.Hrs. 3 +3
Occupational health and safety will be discussed from the perspectives of various professions to understand 1) the issues relevant to individual professions and 2) how these individual perspectives

may conflict. The overall goal for the course is to ensure that the student gains an appreciation for the importance of occupational health and safety to society.

NET CHANGE IN CREDIT HOURS:

+3 HOURS

Biosystems Engineering:

Course introduction:

BIOE 3200 Environmental Engineering for Non-Engineers Cr.Hrs. 3 +3

This course will discuss air pollution and odor control, remediation of contaminated soil and ground water, waste-water and solid waste treatment, and the role of biotechnology in these processes.

Prerequisite: Permission of instructor.

NET CHANGE IN CREDIT HOURS:

+3 HOURS

Civil Engineering:

Course modification:

CIVL 2840 Civil Engineering Geomatics Cr.Hrs. 3

Geomatics in civil engineering, map-making, map-reading, computerized maps; leveling; distance measurement angles, directions, traverses; coordinate geometry; electronic survey instruments; global positioning system; geographic information systems; digital photogrammetric methods and data; aspects of route surveying. Not to be held with the former 023.281 or 023.282 or CIVL 2820. Pre or Co-requisite: MATH 1210, Co-requisite: CIVL 2830 Graphics for Civil Engineers.

NET CHANGE IN CREDIT HOURS:

0 HOURS

Electrical and Computer Engineering:

Course deletions:

ECE 2130 Electric Fields Cr.Hrs. 4 -4

ECE 4750 Contemporary Topics in Electrical Engineering 1 Cr.Hrs. 4 -4

ECE 4760 Contemporary Topics in Electrical Engineering 2 Cr.Hrs. 3 -3

ECE 4770 Contemporary Topics in Electrical Engineering 3 Cr.Hrs. 4 -4

ECE 4780 Contemporary Topics in Electrical Engineering 1 Cr.Hrs. 3 -3

Course introductions:

ECE 2240 Numerical Methods for Electrical Engineers Cr. Hrs. 4 +4

Numerical methods applied to Electrical Engineering problems; mathematical models of physical systems, solutions of linear and non-linear equations, numerical differentiation and integration methods and associated errors, introduction to solution analysis. May not be held with MATH 2120.

Prerequisites: ECE 2262, COMP 1010, MATH 2132.

ECE 3580 Foundations of Electromagnetics Cr.Hrs. 4 +4

(formerly ECE 2130) Fundamental laws of field theory; Maxwell's equations in integral and point form.

Prerequisites: PHYS 2152, MATH 3132 (or MATH 3100).

NET CHANGE IN CREDIT HOURS:

-10 HOURS

Clayton H. Riddell Faculty of Environment, Earth & Resources

Course introduction:

EER 1000 Earth: A User's Guide Cr.Hrs. 3

This course will present a multi-disciplinary introduction to the Planet Earth as both the source of essential resources and as the site of resulting negative impacts. Focus in the course will be provided by addressing important and current topics, case studies, and concepts that the well-educated citizen of the Earth should understand and will include natural and human-induced processes within a broad range of spatial and temporal scales.

NET CHANGE IN CREDIT HOURS

+3 HOURS

Faculty of Human Ecology

Course introduction:

HNSC 4600 Practice-based Research in Human Nutritional Sciences Cr.Hrs. 3

A practice-based research project relevant to dietetic practice. Prerequisite: Registration in the 4th year of the Human Nutritional Sciences program and any two of HNSC 3300, HNSC 3320 and HNSC 3330, and instructor permission required. Enrolment limited to students pre-selected by the Manitoba Partnership Dietetic Education Program. Not to be held with HNSC 4120 or HNSC 4122.

Course modification:

HNSC 4140 Quantity Food Production and Management Cr. Hrs. 3

(Lab required) (formerly 030.414) Menu planning. Food costing. Experience in standard methods of institutional food production and service. Prerequisites: HNSC 3342 (or HNSC 3340 or 030.334) and HNSC 2160 (030.216) or consent of instructor. Additionally, students must complete the Food Handlers Certificate Program and must submit the form to the Department by June 15th in order to be permitted to enter HNSC 4140.

NET CHANGE IN CREDIT HOURS

+3 HOURS

Program changes:

Modification to the degree requirements for students in the Nutrition Option of the Human Nutritional Sciences Program from HNSC 4320 Nutritional Management of Disease States as a requirement to *either* HNSC 4320 *or* HNSC 4300 Community Nutrition Interventions.

Modification to the degree requirements for students in the Food Industry Option of the Human Nutritional Sciences Program from FOOD 4520 The Packaging of Food *to one of*: FOOD 3160 Frozen Dairy Products, FOOD 3170 Cheese and Fermented Milk Products, FOOD 3200 Baking Science.

Faculty of Kinesiology and Recreation Management

Proposed external minor in Recreation Studies:

12 credit hours of required courses: PERS 1300 Introduction to Leisure Travel (3), PERS 1400 Concepts of Recreation and Leisure (3), REC 2400 Management and Marketing of Leisure Services (3), REC 3090 Sustainable Nature-based Tourism (3).

Plus 6 credit hours from the following list: REC 4090 Sustainable Nature-based Tourism Planning, Management & Research (3), REC 4170 Sport Management (3), REC 4200 Special Topics (3), REC 4250 Leisure and Aging (3), REC 4310 Administration of Special Events (3), REC 4350 Parks and Protected Areas Planning & Management (6).

Faculty of Nursing

Program modification:

In order to accommodate students who have not yet graduated from the old curriculum, the Faculty proposes that students admitted prior to September 2006, complete NURS 4310 Leadership and Issues in Nursing in place of NURS 4170 Issues and Trends in Nursing and NURS 4190 Leadership in Nursing as indicated in the old curriculum.

The course guidelines appearing in the General Calendar have specific information for course NURS 4290 Clinical Practicum. The guideline (although not the course description) states that "*Practicum experiences are to be completed within the province of Manitoba.*" This statement will be removed to allow more flexibility in location to the students.

Faculty of Science

Biotechnology Program

Course introductions:

BTEC 4000 Research Project in Biotechnology Cr.Hrs. 6 (Lab required) +6

Students carry out independent biotechnology based research in their area of interest under the supervision of a faculty member or an approved external biotechnology professional. Results will be presented as an interim oral report and a written journal style paper. Registration restricted to Year 4 Honours Biotechnology students. Not to be held with any other Research Project courses such as MBIO 4530 or CHEM 4710.

BTEC 3980 Work Term 1 Cr.Hrs. 0 0

Work assignments in business, industry or government for students registered in the Biotechnology Honours Cooperative program. Requires submission of a written report covering the work completed during the four-month professional assignment. (Pass/Fail grade only).

BTEC 3990 Work Term 2 Cr.Hrs. 0 0

Work assignments in business, industry or government for students registered in the Biotechnology Honours Cooperative program. Requires submission of a written report covering the work completed during the four-month professional assignment. (Pass/Fail grade only).

BTEC 4980 Work Term 3 Cr.Hrs. 0 0
Work assignments in business, industry or government for students registered in the Biotechnology Honours Cooperative program. Requires submission of a written report covering the work completed during the four-month professional assignment. (Pass/Fail grade only).

BTEC 4990 Work Term 4 Cr.Hrs. 0 0
Work assignments in business, industry or government for students registered in the Biotechnology Honours Cooperative program. Requires submission of a written report covering the work completed during the four-month professional assignment. (Pass/Fail grade only).

NET CHANGE IN CREDIT HOURS +6 HOURS

Chemistry

Course modifications:

CHEM 4640 Spectroscopy, Relaxation, and Structure Cr.Hrs. 3
(formerly 002.464) A course dealing with quantum mechanical manipulation and illustrations from other spectroscopies; relaxation and polarization phenomena. Not to be held with the former 002.456. Prerequisite: CHEM 3370 (or 002.337)(C) or permission of the instructor.

CHEM 4680 Organometallic Chemistry Cr.Hrs. 3
(formerly 002.468) Chemistry of organometallic compounds of the transition metals and representative elements. Prerequisite: CHEM 3380 (or 002.338) or CHEM 3390 (or 002.339) (C).

NET CHANGE IN CREDIT HOURS: 0

Program modification:

The Department is proposing a modification to the entry requirements for the B.Sc. Honours and B.Sc. Major degree programs.

DEPARTMENT OF CHEMISTRY
Program Changes
2009-2010

***Modifications to the entrance requirements for Chemistry Honours and the Chemistry Major programs.**

Change the Chemistry 4-Year Major Program entry requirements from:

To enter the four year Major in Chemistry, students must have CHEM 1300 (C+) and CHEM 1310 (C+); PHYS 1050 (or PHYS 1020) and PHYS 1070; MATH 1500 and MATH 1700 or any equivalent and have satisfied all faculty requirements for entry to the four year Major program.

to:

To enter the four year Major in Chemistry, students must have CHEM 1300 (C+) and CHEM 1310 (C+); PHYS 1050 (or PHYS 1020); MATH 1500 and MATH 1700 or any equivalent and have satisfied all faculty requirements for entry to the four year Major program. If not already completed, PHYS 1070 must be taken at the first opportunity after entry to the program.

Change the Chemistry Honours Program entry requirements from:

To enter the Honours program in Chemistry, students must have CHEM 1300 (B) and CHEM 1310 (B); PHYS 1050 (C) (or PHYS 1020 (C+)) and PHYS 1070 (C); MATH 1500 (C) and MATH 1700 or any equivalent with a grade of "C"; and have satisfied all faculty requirements for entry to the Honours program.

to:

To enter the Honours program in Chemistry, students must have CHEM 1300 (B) and CHEM 1310 (B); PHYS 1050 (C) (or PHYS 1020 (C+)); MATH 1500 (C) and MATH 1700 or any equivalent with a grade of "C"; and have satisfied all faculty requirements for entry to the Honours program. If not already completed, PHYS 1070 must be taken at the first opportunity after entry to the program.

Computer Science

Course deletion:

COMP 4270 Design Theory and Coding Theory Cr.Hrs. 3 -3

Course introductions:

COMP 3820 Introduction to Bioinformatics Algorithms Cr.Hrs. 3 +3

An introduction to problems in molecular biology and computational solutions. Focus on design and analysis of efficient algorithms. Prerequisites: COMP 2080 and MBIO 2XYO (C) or permission of instructor. Suggested Corequisite: COMP 3170.

COMP 4180 Intelligent Mobile Robotics Cr.Hrs. 3 +3

Topics include artificial intelligence, computer vision, human-robot interaction, and multi-robot systems. These abstract components are grounded in the problem of developing a team of intelligent mobile robots. All topics are covered with specific emphasis on applied problems, e.g. real-time

performance. Not to be held with the former COMP 4060 (Mobile Robotics). Prerequisites: COMP 2160 and COMP 3190 (C).

Course modifications:

COMP 2130 Discrete Mathematics for Computer Science Cr.Hrs. 3
(formerly 074.213) An introduction to the set theory, logic, integers, combinatorics and functions for today's computer scientists. Prerequisites: (COMP 1020 or COMP 1021)(C) and [a "C" average in (one of MATH 1210 or MATH 1300 or MATH 1301 (or 136.130) or MATH 1310 (or 136.131 or 010.114 or 013.146)) and (one of MATH 1500 or MATH 1501 (or 136.150), MATH 1510 (or 136.151), MATH 1520 (or 136.152), the former 136.153 or MATH 1690 (or 136.169))].

COMP 2280 Introduction to Computer Systems Cr.Hrs. 3 (Lab required)
(formerly 074.228) Data Representation and manipulation, machine-level representation of programs, assembly language programming, and basic computer architecture. Not to be held with the former 074.222 or 074.240 or (ECE 3610 and ECE 3680). Prerequisites: COMP 2140 (or 074.214)(C), COMP 2160 (or 074.216)(C), and COMP 2130 (or 074.213)(C).

COMP 3090 Digital Logic 2 Cr.Hrs. 3
(formerly 074.309) Design and implementation of digital circuits. Minimization and state reduction, asynchronous circuits, arithmetical circuits, implementation using modern hardware techniques. Not to be held with ECE 2220 or the former 074.342, 074.447 or 024.422. Prerequisite: COMP 2280 (or 074.228)(C) or [both (074.222 and 074.223)(C)].

COMP 3290 Introduction to Compiler Construction Cr.Hrs. 3
(formerly 074.329) Introduction to the standard compiler phases: scanning, parsing, symbolic-table management, code generation, and code optimization. The emphasis is on the simpler techniques for compiler construction such as recursive descent. Prerequisites: [COMP 2140 (or 074.214 or 074.206) or COMP 2061 (C)] and COMP 2280 (or the former 074.2228 or 074.222)(C) or (ECE 3610 and ECE 3680)(C in both courses). COMP 2160 (or 074.216) is recommended.

COMP 3370 Computer Organization Cr.Hrs. 3
(formerly 074.337) Principles of computer systems architecture, organization and design. Performance, instruction sets, processors, input/output, memory hierarchies. Prerequisites: COMP 2280 (or 074.228 or 074.222)(C) or (ECE 3610 and ECE 3680)(C in each course).

COMP 3430 Operating Systems Cr.Hrs. 3 (Lab required)
(formerly 074.343) Operating systems, their design, implementation, and usage. Not to be held with the former 074.450 or 074.460. Prerequisites: [COMP 2140 (or 074.214 or 074.206)(C) or COMP 2061 (C)] and [COMP 2280(C) or (ECE 3610 and ECE 3680)(C in both courses)]. COMP 2160 (or former 074.216) is recommended.

COMP 3720 Computer Networks 1 Cr.Hrs. 3 (Lab required)
(formerly 074.372) This course examines the principles of computer networks, including network architecture, algorithms, and performance. Not to be held with the former 074.430 or ECE 3700. Prerequisites: COMP 2140 (or 074.214)(C) and COMP 2280 (or 074.228)(C).

COMP 4510 Introduction to Parallel Computation Cr.Hrs. 3
(formerly 074.451) An overview of the architectures of current parallel processors and the techniques used to program them. Not to be held with ECE 4530 or the former 024.446. Prerequisites: COMP 3370 (or 074.337)(C) and COMP 4340 (or 074.434)(C).

COMP 4550 Real-Time Systems Cr.Hrs. 3

(formerly 074.455) An introduction to theory and practice of real-time systems. Topics include the design of real-time systems, scheduling, event based processing, and real-time control. Not to be held with (ECE 4240 and ECE 3760). Prerequisites: COMP 3430 (or former 074.343)(C) and COMP 3370 (or 074.337)(C).

The Department proposes the modification of a further three courses to remove reference to MATH 1530 or MATH 1730 (which have never been offered) from the list of prerequisites: COMP 2130 Discrete Mathematics for Computer Science (3), COMP 2190 Introduction to Scientific Computing (3), and COMP 4530 Introduction to Simulation and Model Building (3).

NET CHANGE IN CREDIT HOURS:

+3

Program modification:

DEPARTMENT OF COMPUTER SCIENCE

Program Change

2009-2010

Change the footnote outlining the Mathematics course requirements for the purposes of entering the Computer Science Honours and the 4-Year Computer Science Major Degree Programs from:

¹ MATH 1310 may be taken in place of MATH 1300; MATH 1510, MATH 1520, or MATH 1690 may be taken in place of MATH 1500.

to:

¹ **MATH 1210** or MATH 1310 may be taken in place of MATH 1300; MATH 1510, MATH 1520, or MATH 1690 may be taken in place of MATH 1500.

Mathematics

Course deletions:

MATH 1530 Calculus with Computers Cr.Hrs. 3	-3
MATH 1680 Mathematics for Agriculture and Related Sciences Cr.Hrs. 6	-6
MATH 1730 Calculus 2 with Computers Cr.Hrs. 3	-3
MATH 2550 Modern Geometry Cr.Hrs. 6	-6
MATH 3510 Mathematical Theory of Operational Research Cr.Hrs. 3	-3
MATH 3520 Mathematical Elements for Computational Graphics Cr.Hrs. 3	-3

Course introduction:

MATH 2552 Geometry of the Plane Cr.Hrs. 6	+6
(formerly MATH 2550 or 136.255) A modern approach to geometry through the use of geometric transformations. Topics may include isometries, symmetries, similarities, circular inversion and groups. Not to be held with MATH 2551 or the former MATH 2550 (or 136.255). Prerequisites: [MATH 1690 (or 136.169)(C) or MATH 1500 or MATH 1502 (or 136.150) or MATH 1510 (or 136.151) or MATH 1520 (or 136.152)] and one of [MATH 1300 (C) or MATH 1301 (or 136.130)(C) or MATH 1310 (or 136.131)(C) or MATH 1700 (C) or MATH 1701 (or 136.170)(C) or MATH 1710 (or 136.171)(C)].	

and the modification of 13 courses to remove references to MATH 1530 or MATH 1730 (which have never been offered): MATH 1500 Introduction to Calculus (3), MATH 1510 Applied Calculus 1 (3), MATH 1520 Introductory Calculus for Management and Social Sciences (3), MATH 1690 Calculus (6), MATH 1700 Calculus 2 (3), MATH 1710 Applied Calculus 2 (3), MATH 2300 Linear Algebra 2 (3), MATH 2352 Advanced Linear Algebra (6), MATH 2550 Modern Geometry (6), MATH 2600 Numerical Mathematics 1 (3), MATH 2720 Multivariable Calculus (3), MATH 2730 Sequences and Series (3) and MATH 2750 Intermediate Calculus (6).

Course modifications:

MATH 1010 Applied Finite Mathematics Cr.Hrs. 3 (Lab required)
(formerly 136.101) For students needing to fill the requirement of a university level mathematics course. Introduces students to modern applications of discrete mathematics. Topics include: mathematics of finance, linear programming, graph theory, and game theory. This is a terminal course and may not be used as a prerequisite for other Mathematics courses. Not available to any student already holding a grade of "C" or better in a current or previously held Mathematics course with the exception of MATH 1020 (or FA 1020 or 136.102) or MATH 1190 or MATH 1192 (136.119). Not to be taken concurrently with any other Mathematics courses with the exception of MATH 1020 (FA 1020) or MATH 1190 or MATH 1191. This course cannot be used as part of an Honours, Major, General or Minor program in the mathematical sciences. No prerequisite.

MATH 1020 Mathematics in Art Cr.Hrs. 3
(formerly 136.102) Specific theory, structuring systems, and mathematical methods and principles used in works of art from various historical periods and contexts will be explored in relation to Euclidean and non-Euclidean geometries. Topics include: linear perspective; shapes, patterns, balance and symmetry; ratio, proportion and harmony; and order, dynamics, and chaos. The course will be one half art and one half mathematics, team-taught by faculty from the School of Art and the Department of Mathematics. This course is also given in the School of Art as FA 1020. This is a terminal course and may not be used as a prerequisite for other Mathematics courses. Not available to any student already holding a grade of "C" or better in a current or previously held Mathematics course with the exception of MATH 1010 (or 136.101), MATH 1190 or MATH 1191 (Or 136.119). Not to be taken concurrently with any Mathematics courses with the exception of MATH 1010, MATH 1190 or MATH 1191. This course cannot be used as part of an Honours, Major, General or Minor program in the mathematical sciences. Not to be held with FA 1020 (or 054.102). No prerequisite.

MATH 1190 Topics in Mathematics Cr.Hrs. 6
(formerly 136.119) This course is designed to give students in various faculties a measure of insight into modern mathematics. Topics are taken from number systems, geometry, and combinatorics. This is a terminal course and may not be used as a prerequisite for other Mathematics courses. It may not be used as part of an Honours, Major, General, or Minor program in the mathematical sciences. Not available to any student already holding a grade of C or better in any Mathematics course, with the exception of MATH 1010 (or 136.101), MATH 1020 (FA 1020 or 136.102 or 054.102). Not to be taken concurrently with any other Mathematics courses with the exception of MATH 1010, MATH 1020 (FA 1020). Not to be held with MATH 1192. No prerequisites.

MATH 1200 Elements of Discrete Mathematics Cr.Hrs. 3 (Lab required)
(formerly 136.120) Sequences and series, trigonometry, complex numbers, algebra of polynomials, approximation of zeros of functions, linear difference equations. Not to be held with MATH 1201 or MATH 1210. Not available to students holding credit in any Math courses numbered 2000 or above, unless MATH 1200 is a required course in the student's program. Prerequisite: a minimum grade of

60% in Pre-calculus 40S or the former Mathematics 40S (300), or a grade of 60% or better in the Mathematical Skills course taught by Extended Education.

MATH 1210 Techniques of Classical and Linear Algebra Cr.Hrs. 3 (Lab required)

To introduce a variety of practical algebraic concepts and skills necessary for the study of calculus and advanced engineering mathematics. The emphasis of this course is in the development of methodology and algebraic skill necessary for successful completion of subsequent engineering mathematics courses. This course is intended for engineering and geophysics students only. Not to be held with MATH 1200 or MATH 12010 (136.120), MATH 1300 or MATH 1301 or MATH 1310 (136.131). Prerequisite: a minimum grade of 60% in Pre-calculus 40S or the former Mathematics 40S (300), or a grade of 60% or better in the Mathematical Skills course taught by Extended Education.

MATH 1300 Vector Geometry and Linear Algebra Cr.Hrs. 3 (Lab required)

(formerly 136.130) An introduction to vectors, matrices, systems of linear equations and three – dimensional geometry. Not to be held with MATH 1210, MATH 1301 (or 136.130), MATH 1310 (or 136.131) or the former MATH 1680 (or 136.168). Prerequisite: a minimum grade of 60% in Pre-calculus 40S or the former Mathematics 40S (300), or a grade of 60% or better in the Mathematical Skills course taught by Extended Education. Note: A minimum grade of 70% in Applied Mathematics 40S may be used as a prerequisite to this course.

MATH 1310 Matrices for Management and Social Sciences Cr.Hrs. 3 (Lab required)

(formerly 136.131) Matrix methods with examples relevant to the Management and Social Sciences. Topics include vectors, matrices, systems of linear equations, and determinants; applications include economic models, the simplex method for linear programming, Markov chains, and game theory. Not to be held with MATH 1210, MATH 1300 or MATH 1301 (or 136.130), or the former MATH 1680 (or 136.168). Prerequisite: a minimum grade of 60% in Pre-calculus 40S or the former Mathematics 40S (300), or a grade of 60% or better in the Mathematical Skills course taught by Extended Education. Note: A minimum grade of 70% in Applied Mathematics 40S may be used as a prerequisite to this course.

MATH 1500 Introduction to Calculus Cr.Hrs. 3 (Lab required)

(formerly 136.150) Differentiation and integration of elementary functions with applications to maxima and minima, rates of change, area, and volume. Not to be held with MATH 1501 (or 136.151), MATH 1520 (or 136.152)(or the former MATH 1680 (136.168), MATH 1690 (136.169 or 136.153)). Prerequisite: a minimum grade of 60% in Pre-calculus 40S or the former Mathematics 40S (300), or a grade of 60% or better in the Mathematical Skills course taught by Extended Education.

MATH 1510 Applied Calculus Cr.Hrs. 3 (Lab Required)

(formerly 136.151) Functions and graphs; limits and continuity; differentiation of functions defined explicitly, implicitly and parametrically; applications of derivatives to velocity and acceleration, related rates, maxima and minima; differentials, indefinite and definite integrals, application of integration to area. Physical applications in this course make it especially suitable for students intending to take programs in engineering. Not to be held with MATH 1500, MATH 1501 (or 136.151), MATH 1520 (or 136.152)(or the former MATH 1680 (136.168), MATH 1690 (136.169 or 136.153)). Prerequisite: a minimum grade of 60% in Pre-calculus 40S or the former Mathematics 40S (300), or a grade of 60% or better in the Mathematical Skills course taught by Extended Education; and Physics 40S (300) or "P" on PHYS 0900 (or 016.090).

MATH 1520 Introductory Calculus for Management and Social Sciences Cr.Hrs. 3 (Lab required)

(formerly 136.152) Differentiation and integration of functions of one variable and partial differentiation of functions of variables. Emphasizes applications in the areas of management and

social science. Not to be held with MATH 1500, MATH 1501 (or 136.151), MATH 1520 (or 136.152)(or the former MATH 1680 (136.168), MATH 1690 (136.169) or 136.153). Prerequisite: a minimum grade of 60% in Pre-calculus 40S or the former Mathematics 40S (300), or a grade of 60% or better in the Mathematical Skills course taught by Extended Education.

MATH 1690 Calculus Cr.Hrs. 6 (Lab required)

(formerly 136.169) An introduction to the calculus of functions of one variable. This course covers the same material as MATH 1500 (or 136.150) and MATH 1700 (or 136.170) together, but in greater depth. Exposure to high school calculus (45S) is desirable, but not essential. This course is mathematically challenging and is intended for students planning to enter an Honours or 4 year Major program in Mathematics. Not to be held with MATH 1500, MATH 1501 (or 136.150), MATH 1510 (or 136.151), MATH 1520 (or 136.152), the former 136.153, MATH 1680 (or 136.168), MATH 1700 (or 136.170), MATH 1710 (or 136.171), or the former 136.173. Prerequisite: a minimum grade of 80% in Pre-calculus Mathematics 40S or the former Mathematics 40S (300).

MATH 1700 Calculus 2 Cr.Hrs. 3 (Lab required)

(formerly 136.170) Theory and techniques of integration, curve sketching, volume, arc length, surface area and partial derivatives. Not to be held with MATH 1690 (or 136.169), MATH 1701 (or 136.170) or MATH 1710 (or 136.171). Prerequisite: MATH 1500(C), MATH 1501 (or 136.150)(C), MATH 1510 (or 136.151)(C), MATH 1520 (or 136.152)(C), the former 136.153 (C), or the former MATH 1680 (or 136.168)(C).

MATH 1710 Applied Calculus 2 Cr.Hrs. 3 (Lab required)

(formerly 136.171) Applications of integration to volumes, centres of mass, moments of inertial, work and fluid pressure; differentiation of trigonometric, inverse trigonometric, exponential, and logarithmic functions; techniques of integration; polar coordinates. Physical applications in this course make it especially suitable for students intending to take programs in engineering. Not to be held with MATH 1690 (or 136.169), MATH 1700 or MATH 1701 (or 136.170). Prerequisite: MATH 1500(C), MATH 1501 (or 136.150)(C), MATH 1510 (or 136.151)(C), MATH 1520 (or 136.152)(C), the former 136.153 (C), or the former MATH 1680 (or 136.168)(C). Prerequisite or concurrent requirement: PHYS 1050 or PHYS 1051.

MATH 2130 Engineering Mathematical Analysis 1 Cr.Hrs. 3 (Lab required)

Multivariable differential and integral calculus up to and including multiple integrals in cylindrical and spherical coordinates. Not to be held with MATH 2720 (or 136.272 or the former 136.270), MATH 2750 (or 136.275) or the former MATH 2110 (or 136.211). For Engineering and Geophysics students only. Prerequisites: MATH 1210 (C) and MATH 1710 (or 136.171)(C).

MATH 2132 Engineering Mathematical Analysis 2 Cr.Hrs. 3 (Lab required)

Infinite series, Taylor and Maclaurin Series; ordinary differential equations including Laplace transforms. Not to be held with MATH 2800 (or 136.280), MATH 2730 (or 136.273 or the former 136.271) or the former MATH 2100 (or 136.210). For Engineering and Geophysics students only. Prerequisites: MATH 1210 (C) and MATH 1710 (or 136.171)(C).

MATH 2300 Linear Algebra 2 Cr.Hrs. 3 (Lab required)

(formerly 136.230) A continuation of MATH 1300 or MATH 1310. Finite dimensional vector spaces; linear transformation and matrices; eigenvalues and eigenvectors; diagonalization and applications; inner product spaces. Not to be held with MATH 2301 (or 136.230), MATH 2352 (or the former MATH 2350 or 136.235) or MATH 3130 (or 136.313). Prerequisites: [MATH 1300(C) or MATH 1301 (or 136.130)(C) or MATH 1310 (or 136.131)(C)] and [one of MATH 1500 (C) or MATH 1501 (136.150)(C), MATH 1510 (136.151)(C), MATH 1520 (or 136.152)(C) or MATH 1690 (or 136.169)(C)].

MATH 2352 Advanced Linear Algebra Cr.Hrs. 6

(formerly MATH 2350 or 136.235) Vector spaces, linear transformations, inner product spaces, eigenvalues and eigenvectors, orthogonal and Hermitian matrices, and applications. This course is mathematically challenging and is intended primarily for students registered in Honours, Joint Honours or the Four-Year Major program. Registration in this course requires approval of the department. Not to be held with MATH 2300, MATH 2301 (or 136.230)(or the former MATH 2350 or 136.235) or MATH 3130 (or 136.313). Prerequisites: a grade of "C+" or better in MATH 1300 or MATH 1301 (or 136.130) or MATH 1310 (or 136.131); and a grade of "C+" or better in one of MATH 1690 (136.169), MATH 1700, MATH 1701 (136.170), MATH 1710 (136.171) or the former 136.173.

MATH 2450 Combinatorial Mathematics Cr.Hrs. 6

(formerly 136.245) An introduction to several areas of current interest in combinatorial mathematics, including techniques of enumeration, graphs, block designs and generalizations, linear recursions. This course is not normally offered every year. Prerequisite: An average of "C" or better in six credit hours of Year 1 Math courses with the exception of MATH 1010 (or 136.101), MATH 1020 (or 136.102)(FA 1020 (or 054.102)) and MATH 1190 or MATH 1191 (or 136.119); or consent of department.

MATH 2600 Numerical Mathematics 1 Cr.Hrs. 3

(formerly 136.260) Elementary techniques of numerical solution of mathematical problems: solution of equations, finite differences, interpolation, systems of equations, numerical differentiation and integration. Not to be held with MATH 2601 (or 136.260) or MATH 2120 (or 136.212). Prerequisites: [MATH 1300(C) or MATH 1301 (or 136.130)(C) or MATH 1310 (or 136.131)(C) or MATH 1690 (or 136.169)(C) or MATH 1700 (C) or MATH 1701 (or 136.170)(C) or MATH 1701 (or 136.171)(C)] and [COMP 1010 (C) or COMP 1011 (or 074.101)(C) or equivalent]; or consent of instructor.

MATH 2720 Multivariable Calculus Cr.Hrs. 3

(formerly 136.272) Calculus of several variables. Not to be held with MATH 2130 (or the former MATH 2110 or 136.211) or MATH 2750 (or 136.275) or 136.270 or MATH 2721 (or 136.272). Prerequisites: [MATH 1300(C) or MATH 1301 (or 136.130)(C) or MATH 1310 (or 136.131)(C)] and [one of MATH 1690 (or 136.169)(C), MATH 1700 (C) or MATH 1710 (or 136.170)(C) or MATH 1710 (or 136.171)(C) or the former 136.173(C)].

MATH 2730 Sequences and Series Cr.Hrs. 3

(formerly 136.273) Introductory analysis, sequences and series. Not to be held with MATH 2132 (or the former MATH 2100 or 136.210) or MATH 2750 (or 136.275), or 136.271 or MATH 2731 (or 136.273). Prerequisite: one of MATH 1690 (or 136.169)(C), MATH 1700 (C) or MATH 1701 (or 136.170)(C), or MATH 1710 (or 136.171)(C) or the former 136.173 (C). Prerequisite or concurrent requirement: MATH 1300 or MATH 1301 or MATH 1310.

MATH 2750 Intermediate Calculus Cr.Hrs. 6

(formerly 136.275) Sequences, series and power series. Differentiation and integration of real-valued functions of several real variables. Not to be held with MATH 2130, MATH 2132, the former MATH 2110 (136.211), the former MATH 2100 (136.210), MATH 2720 or MATH 2721 (or 136.272), MATH 2730 or MATH 2731 (or 136.273). This course is mathematically challenging and is intended primarily for students registered in an Honours, Joint Honours or Four-Year Major Program. Registration in this course requires approval of the department. Prerequisite: a grade of "C+" or better in MATH 1300 or MATH 1301 (or 136.130) or MATH 1310 (or 136.131) and a grade of "C+" or better in one of MATH 1690 (or 136.169), MATH 1700 or MATH 1701 (or 136.170), MATH 1710 (or 136.171)(C) or the former 136.173.

MATH 2800 Ordinary Differential Equations with Applications 1 Cr.Hrs. 3
(formerly 136.280) An introduction to the theory of ordinary differential equations and practical techniques of solution, principally relating to first order and linear higher order equations; linear systems. Applications to problems in science and other selected areas. Not to be held with MATH 2801 (or 136.280) or MATH 2132 or the former MATH 2100 (or 136.210). Prerequisite: MATH 1300 (C) or MATH 1301 (or 136.130(C) or MATH 1310 (or 136.131)(C). Prerequisite or concurrent requirement: MATH 2720 or MATH 2750.

MATH 3120 Applied Discrete Mathematics Cr.Hrs. 3 (Lab required)
(formerly 136.312) Sets, groups, graphs, and Boolean algebra. For Engineering students only. Not to be held with COMP 2130 (or 074.213) or 074.212. Prerequisite: MATH 2120 (or 136.212)(C).

MATH 3130 Linear Spaces for Physicists Cr.Hrs. 3
(formerly 136.313) A course intended for honours/major students in Physics. Review of linear algebra (MATH 1300) vector spaces; linear transformations; eigenvalues and eigenvectors; inner products spaces; additional topics as time permits. Not to be held with MATH 2300 or MATH 2301 (or 136.230) or MATH 2352 (or 136.235). Prerequisites: MATH 2750 (or 136.275)(C) or [both (MATH 2720 or MATH 2721 (136.272 or 136.270)(C)) and PHYS 2490 (or the former 016.237)(C)].

MATH 3132 Engineering Mathematical Analysis 3 Cr.Hrs. 3
Vector integral calculus; series of Ordinary differential equations; Fourier series and partial differential equations. For Engineering and Geophysics students only. Not to be held with MATH 3740 (or 136.374), MATH 3800 (or 136.380), MATH 3810 (or 136.381) or the former MATH 3100 (or 136.310). Prerequisites: MATH 2130 (C) and MATH 2132 (C).

MATH 3142 Engineering Mathematical Analysis 4 Cr.Hrs. 3
Introduction to discrete mathematics; systems of linear differential equations; complex function theory and applications. For Engineering and Geophysics students only. Not to be held with the former MATH 3110 (or 136.311) or MATH 3700 (or 136.370) or MATH 3170 (or 136.371) or MATH 3800 (or 136.380). Prerequisites: MATH 2130 (C); and MATH 2132 (or the former MATH 2110 or 136.211)(C). NOTE: MATH 3132 is highly recommended.

MATH 3210 Topology Cr.Hrs. 3
(formerly 136.321) An introduction to topology. Topological spaces, metric spaces; compactness, connectedness; continuity of mappings. May not be used in an Honours program. Not to be held with MATH 3240 or MATH 3230 (or 136.323). Prerequisite: MATH 3200 (or 136.320)(C) or consent of department.

MATH 3530 Mathematical Problems in the Biological Sciences Cr.Hrs. 3
(formerly 136.353) Circulatory system, flow of blood. Enzyme kinetics. Cell populations. Diffusion in biology. Some ecological systems. Prerequisites: MATH 2300 (C) or MATH 2301 (or 136.230)(C); and MATH 2730 (136.273)(C) and MATH 3800 (or 136.380)(C); or consent of department.

MATH 3600 Numerical Mathematics 2 Cr.Hrs. 3
(formerly 136.360) Numerical differentiation and Gaussian quadrature; curve-fitting by splines; numerical methods for initial-value problems, boundary-value problems, and transforms; problems involving large, sparse or ill-conditioned linear systems. Not to be held with MATH 3601 (136.360). Prerequisites: MATH 2600 (C) or MATH 2601 (136.260)(C); MATH 2800 (C) or MATH 2801 (136.280)(C); one of MATH 2720 (MATH 2721, 136.270, 136.272)(C) or MATH 2730 (MATH 2731,

136.271, 136.273)(C) or MATH 2750 (136.275)(C); and either COMP 1010 (C) or COMP 1011 (074.101)(C); or consent of department.

MATH 3700 Applied Complex Analysis Cr.Hrs. 3

(formerly 136.370) Concepts and techniques of complex variable theory in the context of applied mathematics. Not to be held with MATH 3142 (or the former MATH 3110 (or 136.311), MATH 3710 (or 136.271). Prerequisites: MATH 2720 (or MATH 2721 or 136.272 or the former 136.270)(C); and either MATH 2730 (or Math 2730 or 136.273 or the former 136.271)(C) or MATH 2750 (or 136.275)(C) or PHYS 2490 (or the former 016.237)(C); or consent of department.

MATH 3710 Complex Analysis 1 Cr.Hrs. 3

(formerly 136.371) The geometry of the complex plane, analytic functions, contour integration. Cauchy's theorem and formula, the residue theorem, etc. Not to be held with MATH 3142 (or the former MATH 3110 (or 136.311)) or MATH 3700 (or 136.370). Prerequisite: MATH 3230 (136.323).

MATH 3760 Advanced Calculus Cr.Hrs. 6

(formerly 136.376) Vector analysis; The Riemann and Riemann-Stieltjes integral, uniform convergence of series and integrals, power series and Fourier series. This course is taught at an Honours/Major level. Not to be held with MATH 3740 (formerly 136.375). Prerequisites: MATH 2750 (or 136.275)(C) and MATH 2352 (or MATH 2350 or 136.235)(C) and MATH 2202 (or the former MATH 2200 or 136.220)(C); or consent of department.

MATH 3800 Ordinary Differential Equations with Applications 2 Cr.Hrs. 3

(formerly 136.380) Laplace transforms, series solutions of ODEs, systems of linear ODEs, applications, introduction to dynamical systems. Prerequisites: MATH 2800 (C) or MATH 2801 (or 136.280)(C); and one of MATH 2730 (136.273)(C) or MATH 2731 (136.271)(C) or MATH 2750 (136.275)(C).

MATH 4310 Applied Matrix Analysis Cr.Hrs. 3

Vector and matrix norms; LU, QR, Schur, and singular value decompositions; projections; least squares; Gerschgorin theorem, perturbation theory; positive definite systems; quadratic forms; pseudoinverse; diagonalization; canonical forms; function of matrices; minimal polynomials; Perron-Frobenius theory; and applications. Not to be held with MATH 3500 (136.350). Prerequisite: MATH 2300 or MATH 2301 (136.230) or MATH 2352 (or the former MATH 2350 (136.235)).

MATH 4430 Introduction to Elliptic Curves Cr.Hrs. 3

(formerly 136.443) Homogeneous coordinates, non-singular cubic curves, cubic curves of finite fields. Prerequisites: MATH 2500 (C) or MATH 2501 (or 136.250)(C) and MATH 2352 (or the former MATH 2350 or 136.235)(C) and [MATH 3300 (or 136.330)(C) and MATH 3310 (or 136.331)(C)] or MATH 3350 (or 136.335)(C).

MATH 4900 Project Course in Applied Mathematics 1 Cr.Hrs. 3

(formerly 136.490) A research project chosen by the student in consultation with the department head and an appropriate supervising Faculty member. A written report will be required, to be submitted by the end of term. An oral examination may be required. This course is restricted to students in fourth year of the Honours program in Mathematics. Prerequisite: MATH 3820 (or 136.382)(C).

NET CHANGE IN CREDIT HOURS:

-18

Microbiology

Course introduction:

MBIO 2410 Essentials of Molecular Biology Cr. Hrs. 3 +3

An introduction to the mechanisms, themes and patterns that are present in the molecular biology of both eukaryotic and prokaryotic organisms. The applications of molecular biology to disciplines such as genomics, applied bioinformatics and medical microbiology will be discussed. Not available to students who have previously obtained credit in, or are currently enrolled in MBIO 3410 or MBIO 3411 (or the former 60.341). Prerequisites: Standing in Grade 12 Biology or Chemistry or BIOL 1000 or CHEM 1000 or higher level BIOL or CHEM course, or permission of instructor.

NOTE: MBIO 2410 is intended for students outside of microbiology who require an introduction to molecular biology, such as those with interests in bioinformatics, biophysics or bioengineering. It may be used to fulfill Microbiology Major or Honours program course requirements if completed prior to MBIO 3410, and it may serve as an Advanced Level Microbiology course in the three-year general program.

NET CHANGE IN CREDIT HOURS: +3

Physics & Astronomy

Course introductions:

PHYS 4360 Medical Radiation Physics Cr.Hrs. 3 (Lab required) +3

The relevant physics of the production and interaction of radiation beams used in both diagnostic and therapeutic medicine will be covered. Such beams included X- and g-rays, particle beams, visible and I.R. radiation, microwaves, and ultrasound. Prerequisites: PHYS 4560 (or 16.456) or consent of department.

PHYS 4400 Medical Imaging Cr. Hrs. 3 +3

Fundamental principles of image formation, analysis of the characteristics of medical images, parametric description of image quality; application to transmission radiography. Prerequisite: consent of instructor.

Course modification:

PHYS 2152 Modern Physics for Engineers Cr.Hrs. 3 (Lab required)

An overview of topics in modern physics including wave particle duality, atomic structure and quantum mechanics. Elementary classical electromagnetic theory and wave theory are reviewed as an introduction to the modern physics concepts. For Engineering students only. Not to be held with PHYS 1070, PHYS 1071 (or 016.107). Prerequisites: PHYS 1050 or PHYS 1051 (or the former 016.105 or 016.118) (C) or PHYS 1020 or PHYS 1021 (016.102)(B); and MATH 1500 or MATH 1501 (136.150) or MATH 1510 (136.151) or MATH 1520 (136.152 or 136.153 (C); and one of MATH 1700 or MATH 1701 or MATH 1690 or MATH 1710.

In addition, the following 10 courses to be modified to remove reference to MATH 1530 or MATH 1730 (which have never been offered): PHYS 1050 Physics 1: Mechanics (3), PHYS 1070 Physics 2: Waves and Modern Physics (3), PHYS 2152 Modern Physics for Engineers (3), PHYS 2200 Electricity and Magnetism (6), PHYS 2250 Introductory Modern Physics (3), PHYS 2260 Optics (3), PHYS 2380 Quantum Physics 1 (3), PHYS 2390 Theoretical Physics 1 (3), PHYS 2600 Electromagnetic Field Theory (3), and PHYS 4640 Introduction to Quantum Mechanics for Advanced Students 1 (3).

NET CHANGE IN CREDIT HOURS:**+6****Program modifications:**

The Department is proposing changes to course requirements in the Honours Degree program and the introduction of a third stream: Option C – Medical and Biological; and a modification to the requirements for the Major Degree program.

DEPARTMENT OF PHYSICS AND ASTRONOMY
Program Changes
2009-2010

Current Honours Programs (options A and B):

5.11.3 Physics and Astronomy, Code: 016			
UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
HONOURS^{1,7} 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
PHYS 1050 (B) (or PHYS 1020 ² (B+)) and PHYS 1070 (B), MATH 1300 ³ (B), MATH 1500 ³ (B), MATH 1700 ³ (B)	PHYS 2260, PHYS 2390, PHYS 2490, PHYS 2380, PHYS 2600, PHYS 2610, PHYS 2650, MATH 2720 ⁸	PHYS 3670, PHYS 3680, PHYS 3430, PHYS 3650, PHYS 3630, PHYS 3640, PHYS 3380	PHYS 4390, PHYS 4510 ⁴ , PHYS 4520 ⁴
Plus 6 credit hours from the Faculty of Arts, which should include the required "W" course ⁶		Plus 3 credit hours of electives with one of the following strongly recommended: PHYS 3220, PHYS 3570, PHYS 3660 and courses from Computer Science, Chemistry, Geological Sciences and Mathematics.	Plus 9 credit hours from PHYS 3570, PHYS 3660, PHYS 4250, PHYS 4560, PHYS 4590, PHYS 4600, PHYS 4620, PHYS 4630
	Choose 1 of:	Students who choose Option B may also want to consider PHYS 3180	
	Option A (Astronomy): PHYS 2070	PHYS 3180	PHYS 4230, PHYS 4240
	Option B (Physics): 6 credit hours to be chosen from MATH 2730 ⁸ , MATH 2800 or courses in Computer Science, Chemistry or Geophysics	MATH 3130	MATH 3700; one of PHYS 4672 or PHYS 4676; and one of PHYS 4674 or PHYS 4678.
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ Students must achieve a minimum grade of "C" in all Honours Physics and Astronomy courses that are either required in the program or required as prerequisites to other Physics and Astronomy courses taken in the Honours program.

² PHYS 1030 is not suitable for entry to the Honours and four year Major program. Students must also take PHYS 1070 if they have already taken PHYS 1030. Students can hold credit for both PHYS 1030 and PHYS 1070.

³ MATH 1310 may be taken in place of MATH 1300; MATH 1510, MATH 1520 or MATH 1530 may be taken in place of MATH 1500; MATH 1710 or MATH 1730 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.

⁴ Other Honours Physics and Astronomy or Honours Mathematics courses may be substituted for one of PHYS 4510 or PHYS 4520 with permission of the department.

⁵ A minimum grade of "C" and an average of "C+" is required on these two Mathematics courses.

⁶ As there are no electives in Year 2 of the program, students should complete the University written English requirement in University 1. If not completed in University 1, a "W" course must be completed prior to Year 3 in addition to the required Year 2 courses.

⁷ The courses required in this program will satisfy the University mathematics requirement.

⁸ MATH 2750 may be taken in lieu of MATH 2720 and MATH 2730.

Proposed Honours Program Option A - Astronomy:

5.11.3 Physics and Astronomy, Code: 016

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
HONOURS Option A: Astronomy¹ 120 CREDIT HOURS (comprising courses listed in chart below.)			
PHYS 1050(B) (or PHYS 1020 B+), PHYS 1070 ² , MATH 1300, MATH 1500, MATH 1700 6 credit hours of ARTS including the "W" requirement. 9 credit hours of open electives (PHYS 1810 and PHYS 1820 are highly recommended for this program).	PHYS 2070(6), PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2600, PHYS 2610, PHYS 2650 3 credit hours of open electives ⁴ .	PHYS 3180, PHYS 3380, PHYS 3430(6), PHYS 3630, PHYS 3650, PHYS 3670, plus 6 additional credit hours of 3000 Level Physics and Astronomy courses 3 credit hours of open electives ⁴ .	PHYS 3680, PHYS 3640, PHYS 4230, PHYS 4240 (6), PHYS 4390, MATH 3130, plus 6 additional credit hours of 4000 level Physics and Astronomy courses 3 credit hours of open electives ⁴ .
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ Students must achieve a minimum grade of "C" in all Honours Physics and Astronomy courses that are either required in the program or required as prerequisites to other Physics and Astronomy courses taken in the Honours program.

² PHYS 1030 is not suitable for entry to the Honours and four year Major program. Students must also take PHYS 1070 if they have already taken PHYS 1030. Students can hold credit for both PHYS 1030 and PHYS 1070.

³ MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700. MATH 2750 may be taken as a recommended course in lieu of MATH 2720 and MATH 2730.

⁴ Although they are not required courses in the Physics programs, MATH 2720, MATH 2730, MATH 2800, and MATH 3700 are highly recommended electives for the Physics Honours and Four Year Major degrees and should be taken when possible.

Changes:

1. The major changes to the Physics programs (Major and Honours Degrees) involve the removal of MATH 2720, 2730, 2800, and 3700 as required courses. These changes cause an overall decrease in required credit hours resulting in an increase to the number of credit hours of electives a student may take.
2. Introduction of a third stream in Honours: Option C – Medical and Biological.

Proposed Honours Program Option B - Physics:

5.11.3 Physics and Astronomy, Code: 016

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
HONOURS Option B: Physics¹ 120 CREDIT HOURS (comprising courses listed in chart below.)			
PHYS 1050(B) (or PHYS 1020 B+), PHYS 1070 ² , MATH 1300, MATH 1500, MATH 1700	PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2600, PHYS 2610, PHYS 2650	PHYS 3380, PHYS 3430(6), PHYS 3650, PHYS 3670, PHYS 3680, PHYS 3630, PHYS 3640, PHYS 3660	PHYS 4250, PHYS 4390, PHYS 4570 PHYS 4520, PHYS 4672, PHYS 4674, PHYS 4590, PHYS 4600, PHYS 4620 MATH 3130
6 credit hours of ARTS including the "W" requirement.			
9 credit hours of open electives	9 credit hours of open electives ⁴	Plus 3 credit hours of open electives ⁴	
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ Students must achieve a minimum grade of "C" in all Honours Physics and Astronomy courses that are either required in the program or required as prerequisites to other Physics and Astronomy courses taken in the Honours program.

² PHYS 1030 is not suitable for entry to the Honours and four year Major program. Students must take PHYS 1070 even if they have already taken PHYS 1030. Students can hold credit for both PHYS 1030 and PHYS 1070.

³ MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700. MATH 2750 may be taken as a recommended course in lieu of MATH 2720 and MATH 2730.

⁴ Although they are not required courses in the Physics programs, MATH 2720, MATH 2730, MATH 2800, and MATH 3700 are highly recommended electives for the Physics Honours and Four Year Major degrees and should be taken when possible.

Proposed Honours Program Option C – Medical and Biological:

5.11.3 Physics and Astronomy, Code: 016

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
HONOURS Option C: Medical and Biological¹ 120 CREDIT HOURS (comprising courses listed in chart below.)			
PHYS 1050(B) (or PHYS 1020 B+), PHYS 1070 ² , MATH 1300, MATH 1500, MATH 1700	PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2600, PHYS 2610, PHYS 2650,	PHYS 3380, PHYS 3430(6), PHYS 3650, PHYS 3670, PHYS 3680, PHYS 3630, PHYS 3640, PHYS 3220	PHYS 4250, PHYS 4560, PHYS 4672, PHYS 4674, PHYS 4360 ECE 3780, MATH 3130
ZOOL 1320, ZOOL 1330	9 credit hours of open electives. ⁴		
6 credit hours of ARTS including the "W" requirement ²	ZOOL 2280 is recommended as an elective in this program. ⁵	Plus 3 credit hours of open electives. ⁴	Plus 6 credit hours of open electives. ⁴
3 credit hours of open electives. ⁵			
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ Students must achieve a minimum grade of "C" in all Honours Physics and Astronomy courses that are either required in the program or required as prerequisites to other Physics and Astronomy courses taken in the Honours program.

² PHYS 1030 is not suitable for entry to the Honours and/or the Four Year Major program. Students must also take PHYS 1070 if they have already taken PHYS 1030. Students can hold credit for both PHYS 1030 and PHYS 1070.

³ MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700. MATH 2750 may be taken as a recommended course in lieu of MATH 2720 and MATH 2730.

⁴ Although they are not required courses in the Physics programs, MATH 2720, MATH 2730, MATH 2800, and MATH 3700 are highly recommended electives for the Physics Honours and Four Year Major degrees and should be taken when possible.

⁵ ZOOL 2280 is a recommended course in Physics Honours – Option C Medical and Biological. If a student plans to take ZOOL 2280, BIOL 1020 and BIOL 1030 should be taken in year one of the program as prerequisites. This will push either the "W" course or the ARTS elective from year one, to year two or three.

Current 4-Year Major Program:

FOUR YEAR MAJOR ^{7,8} 120 CREDIT HOURS (comprising courses listed in chart below, and electives)

PHYS 1050 (C+) (or PHYS 1020 ² (B)) and PHYS 1070 (C+), MATH 1500 ^{3,5} and MATH 1700 ^{3,5}	PHYS 2260, PHYS 2390, PHYS 2490, PHYS 2380, PHYS 2600, MATH 1200, MATH 1300 ³	PHYS 2610, PHYS 2650, PHYS 3670, PHYS 3680, PHYS 3380, MATH 2720 ⁸	PHYS 3430, PHYS 3650, MATH 3130, MATH 3700
Plus 6 credit hours from the Faculty of Arts, which should include the required "W" course.		Plus 18 credit hours which must include PHYS 3630, PHYS 3640 or both of ECE 2160 and ECE 2220, with the remaining from the list of 3000 and 4000 level Honours and Major Physics and Astronomy courses	
Astronomy courses may be used in place of some of the above courses with permission of the department. Consult the department advisor for details.			

NOTES:

¹ Students must achieve a minimum grade of "C" in all Honours Physics and Astronomy courses that are either required in the program or required as prerequisites to other Physics and Astronomy courses taken in the Honours program.

² PHYS 1030 is not suitable for entry to the Honours and four year Major program. Students must also take PHYS 1070 if they have already taken PHYS 1030. Students can hold credit for both PHYS 1030 and PHYS 1070.

³ MATH 1310 may be taken in place of MATH 1300; MATH 1510, MATH 1520 or MATH 1530 may be taken in place of MATH 1500; MATH 1710 or MATH 1730 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.

⁴ Other Honours Physics and Astronomy or Honours Mathematics courses may be substituted for one of PHYS 4510 or PHYS 4520 with permission of the department.

⁵ A minimum grade of "C" and an average of "C+" is required on these two Mathematics courses.

⁶ As there are no electives in Year 2 of the program, students should complete the University written English requirement in University 1. If not completed in University 1, a "W" course must be completed prior to Year 3 in addition to the required Year 2 courses.

⁷ The courses required in this program will satisfy the University mathematics requirement.

⁸ MATH 2750 may be taken in lieu of MATH 2720 and MATH 2730.

⁹ IMPORTANT: The four year Major program need not be completed in the manner prescribed in the chart above. The chart indicates the recommended arrangement of the required courses and is meant to be a guide around which students can plan their program (Letters in brackets refer to minimum prerequisite standing required for further study.)

Proposed 4-Year Major Program:

5.11.3 Physics and Astronomy, Code: 016

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
FOUR YEAR MAJOR 120 CREDIT HOURS (comprising courses listed in chart below.)			
PHYS 1050(B) (or PHYS 1020 B+), PHYS 1070 ² , MATH 1300, MATH 1500, MATH 1700	PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2600, MATH 1200	PHYS 2610, PHYS 2650, PHYS 3380, PHYS 3670, PHYS 3680, plus an additional 3 credit hours of 3000 level Physics and Astronomy.	PHYS 3630, PHYS 3640, PHYS 3430 (6), PHYS 3650, MATH 3130, plus an additional 3 hours of 4000 level Physics and Astronomy.
Plus 6 credit hours from the Faculty of Arts, which should include the required "W" course	Plus 12 credit hours of open electives ⁴	Plus 12 credit hours of open electives ⁴ .	Plus 9 credit hours of open electives ⁴ .
Plus 9 credit hours of open electives.			
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ Students must achieve a minimum grade of "C" in all Physics and Astronomy courses that are either required in the program or required as prerequisites to other Physics and Astronomy courses taken in their program.

² PHYS 1030 is not suitable for entry to the Honours or Four Year Major program. Students must take PHYS 1070 even if they have already taken PHYS 1030. Students can hold credit for both PHYS 1030 and PHYS 1070.

³ MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700. MATH 2750 may be taken in lieu of MATH 2720 and MATH 2730.

⁴ Although they are not required courses in the Physics programs, MATH 2720³, MATH 2730³, MATH 2800, and MATH 3700 are highly recommended electives for the Physics Honours and Four Year Major degrees and should be taken when possible.

IMPORTANT: The four year Major program need not be completed in the manner prescribed in the chart above. The chart indicates the recommended arrangement of the required courses and is meant to be a guide around which students can plan their program (Letters in brackets refer to minimum prerequisite standing required for further study.)

Statistics

Course deletions:

STAT 3010 Topics in Statistical Analysis Applied to Business	-3
STAT 3120 Topics in Regression Analysis	-3
STAT 3130 Statistical Analysis of Designed Experiments	-3
STAT 3180 Exploratory Data Analysis	-3
STAT 3500 Intermediate Statistical Theory I	-3
STAT 3600 Intermediate Statistical Theory II	-3
STAT 4140 Introduction to Statistical Inference	-3
STAT 4620 Mathematical Probability	-3
STAT 4560 Probability Theory	-6

Course introductions:

STAT 3000 Applied Linear Statistical Models Cr. Hrs. 3 +3
Applied linear regression and analysis of variance for designed experiments. This course is not for use in the Honours Major degree programs in Statistics. Not to be held with STAT 3470 (005.347) or STAT 3480 (005.348) or the former STAT 3120 (005.312) or STAT 3130 (0005.313). Prerequisite: STAT 2000 or STAT 2001 (005.200)(C).

STAT 3400 Introduction to Probability 2 Cr.Hrs. 3 (Lab required) +3
Continuation of STAT 2400. Continuous distributions, properties of common distributions, distributions of functions of random variables. Not to be held with the former STAT 3500 (005.350). Prerequisite: STAT 2400 (C). Prerequisite or concurrent requirement: MATH 2720 or MATH 2721 (136.272) or MATH 2730 or MATH 2731 (136.273).

STAT 3800 Mathematical Statistics Cr.Hrs. 3 (Lab required) +3
Multivariate distributions and transformations, order statistics, sampling distributions, convergence, introduction to statistical inference. Not to be held with the former STAT 3600 (005.360). Prerequisite: STAT 3400 (formerly STAT 3500, 005.350)(C). Prerequisite or concurrent requirement: whichever of MATH 2720 (or MATH 2721, 136.272) or MATH 2730 (or MATH 2731, 136.273) not yet taken.

STAT 4100 Statistical Inference I Cr.Hrs. 3 +3
Introduction to methods of estimation, including asymptotic and Bayesian methods. Not to be held with the former STAT 4140 (005.414). Prerequisite: STAT 3800 (formerly STAT 3600 or 005.360)(C).

STAT 4200 Statistical Inference II Cr.Hrs. 3 +3
Introduction to methods of hypothesis testing, including asymptotic and Bayesian methods. Not to be held with the former STAT 4140 (005.414). Prerequisite: STAT 4100 (C).

Course modifications:

STAT 2220 Contemporary Statistics for Engineers Cr.Hrs. 3 (Lab required)
(formerly 005.222) Descriptive statistics, basic probability concepts, special statistical distributions, statistical inference-estimation and hypothesis testing, regression, reliability, statistical process control. Not to be held with STAT 1000, STAT 1001, 005.110. Prerequisite: One of the former MATH 1680 (or 136.168)(C), MATH 1690 (or 136.169)(C), MATH 1700 or MATH 1701 (or 136.170)(C), MATH 1710 (or 136.171)(C) or the former 136.173 (C).

STAT 2400 Introduction to Probability Cr.Hrs. 3 (Lab required)

Basic probability, discrete distributions including binomial, hypergeometric, geometric and Poisson, joint distributions, continuous distributions, statistical inference and applications involving discrete random variables. This course is not available to any student who has previously obtained credit for STAT 3500 (005.350). Prerequisites: STAT 1000 or STAT 1001 (005.100)(C); MATH 1700 (or MATH 1701, 136.170)(C) or MATH 1690 (136.169)(C).

STAT 3050 Introduction to Probability Theory and Its Applications Cr.Hrs. 3

(formerly 005.305) Development of the basic concepts of probability theory and application in areas of biostatistics, actuarial science, reliability theory, queuing theory. Prerequisites: STAT 3400 (formerly STAT 3500 or 005.350)(C); and MATH 2720 (C) or MATH 2721 (136.272 or 136.270)(C); and MATH 2730 or MATH 2731 (136.273 or 136.271)(C).

STAT 3470 Statistical Methods for Research Workers Cr.Hrs. 3

(formerly 005.347) Linear regression, multiple regression, correlation analysis, introduction to one way analysis of variance, some related topics. Not to be held with STAT 3120 (005.312) or STAT 3000. Prerequisite: STAT 2000 (005.200). Prerequisite or concurrent requirement: STAT 3400 (formerly STAT 3500 or 005.350).

STAT 4170 Lifetime Data Analysis Cr.Hrs. 3

(formerly 005.417) An introduction to basic principles and techniques for lifetime data analysis in biostatistics and reliability, with emphasis on theory and applications. Topics to be covered include: censoring, truncation, survival and hazard functions, parametric and nonparametric methods, proportional hazards regression. Prerequisites: STAT 3480 (005.348)(C) and STAT 3800 (formerly STAT 3600 or 005.360)(C), or consent of department.

STAT 4520 Sampling Techniques I Cr.Hrs. 3

(formerly 005.452) A development of sampling theory for use in sample survey problems, in regression estimates, in systematic sampling, sources of errors in surveys. Prerequisites: STAT 3800 (formerly STAT 3600, 005.360)(C) and STAT 3480 (005.348)(C), or consent of department.

STAT 4530 Design of Experiments I Cr.Hrs. 3

(formerly 005.453) Objectives in designing experiments; designs commonly used in research including analysis and an introduction to the construction of designs. Prerequisites: STAT 3800 (formerly STAT 3600, 005.360)(C) and STAT 3480 (005.348)(C), or consent of department.

STAT 4600 Statistics Topics Cr.Hrs. 3

(formerly 005.460) Topics of current interest in Statistics that will vary with the needs and interests of students and Faculty. Prerequisite: STAT 3800 (formerly STAT 3600, 005.360)(C), or consent of department.

STAT 4630 Stochastic Processes Cr.Hrs. 3

(formerly 005.463) An introduction to stochastic processes. Prerequisite: STAT 3050 (005.305)(C) and STAT 3800 (formerly STAT 3600, 005.360)(C), or consent of department.

STAT 4690 Applied Multivariate Analysis Cr.Hrs. 3

(formerly 005.469) The course will emphasize applications of various techniques in multivariate analysis and gaining familiarity with the relevant programs and statistical packages. Prerequisites: STAT 3480 (005.348)(C) and MATH 2300 (or one of MATH 2301 or MATH 2352 or former MATH 2350, 136.230, 136.235)(C), or consent of department.

STAT 4700 Statistical Consulting Cr.Hrs. 3

(formerly 005.470) The role of a Statistics Consultant. Practical consulting experience. This course is normally open to fourth year and graduate students in statistics. Prerequisites: STAT 3800 (formerly STAT 3600, 005.360)(C) and STAT 3480 (005.348)(C), or consent of department. Prerequisite or concurrent requirement: STAT 4520 (005.452) and STAT 4530 (005.453).

NET CHANGE IN CREDIT HOURS:

-15

Program modifications: The Department is also proposing the modification of the requirements for the following programs: Statistics Honours degree, Statistics Major degree, Statistics Minor, Statistics-Actuarial Mathematics Joint Honours, and the Statistics-Mathematics Joint Honours.

DEPARTMENT OF STATISTICS

Program Changes

2009-2010

Current Honours Degree:

(Strikethroughs to be deleted from the program)

5.13.3 Statistics, Code: 005

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
HONOURS ¹ 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
STAT 1000, MATH 1690 (or MATH 1500 ² and MATH 1700 ³), MATH 1300 ²	STAT 2400 (B) MATH 2300, MATH 2720 and MATH 2730 (or MATH 2750)	STAT 3050, STAT 3470 and STAT 3480, STAT 3500, STAT 3600, MATH 3740	STAT 4140, STAT 4520, STAT 4530
Plus sufficient credit hours of electives to total 30 credit hours	Plus sufficient credit hours of electives to total 30 credit hours ³		
The following courses must be taken in University 1 or Year 2		Plus 15 credit hours from STAT 3040, STAT 3170, STAT 3180, STAT 3380, STAT 3490, STAT 4170, STAT 4580, STAT 4590, STAT 4600, STAT 4620, STAT 4630, STAT 4690, STAT 4700 with at least 9 credit hours from STAT 4170, STAT 4580, STAT 4590, STAT 4600, STAT 4620, STAT 4630, STAT 4690 and STAT 4700	
COMP 1010, STAT 2000 (B), MATH 1200		Plus 12 credit hours ³	
6 credit hours from the Faculty of Arts, which should include the required "W" course			
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ The courses required in this program satisfy the University Mathematics requirement.

² MATH 1310 may be taken in place of MATH 1300; MATH 1510, MATH 1520 or MATH 1530 may be taken in place of MATH 1500; MATH 1710 or MATH 1730 may be taken in place of MATH 1700.

³ Of the electives required in Years 2, 3 and 4, 18 credit hours are to be selected from one department which represents a field of application such as: Actuarial Mathematics, Botany, Microbiology, Zoology; Economics, Psychology or Sociology. (Mathematics and Computer Science are excluded from this list.) In consultation with the department, combinations of courses from a coherent area of studies may be selected.

⁴ 15 credit hours are to be taken from either, Computer Science and Mathematics, or from one of the following departments: Actuarial Mathematics, Botany, Microbiology, Zoology, Economics, Psychology or Sociology.

⁵ STAT 3500 and STAT 3600 have corequisites of MATH 2720 and MATH 2730. Therefore students who wish to take STAT 3500 and STAT 3600 should consider taking MATH 1300, MATH 1500 and MATH 1700 in University 1 or Year 2, as they are prerequisite to MATH 2720 and MATH 2730.

Proposed Honours Degree:

(Bolded to be added to the program)

5.13.3 Statistics, Code: 005

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
HONOURS¹ 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
STAT 1000, MATH 1690 (or MATH 1500 ² and MATH 1700 ²), MATH 1300 ²	STAT 2400 (B) MATH 2300 , MATH 2720 and MATH 2730 (or MATH 2750)	STAT 3050, STAT 3400 , STAT 3470, STAT 3480, STAT 3800	STAT 4100 , STAT 4200 , STAT 4520, STAT 4530
Plus sufficient credit hours of electives to total 30 credit hours	Plus sufficient credit hours of electives to total 30 credit hours ³		
The following courses must be taken in University 1 or Year 2		Plus 15 credit hours from STAT 3170, STAT 3380, STAT 3490, STAT 4170, STAT 4580, STAT 4590, STAT 4600, STAT 4630, STAT 4690, STAT 4700 with at least 9 credit hours at the 4000 level.	
COMP 1010, STAT 2000 (B), MATH 1200		Plus 6 credit hours from MATH 2202 , MATH 2600 , MATH 2800 , MATH 3230 , MATH 3540 , MATH 3600 , MATH 3700 , MATH 3740 , MATH 3800 , MATH 3810	
6 credit hours from the Faculty of Arts, which should include the required "W" course		Plus 12 credit hours ³ of approved electives	
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ The courses required in this program satisfy the University Mathematics requirement.

² MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700. MATH 2352 may be taken in place of MATH 2300; MATH 2750 can be taken in place of MATH 2720 and MATH 2730.

³ Of the electives required in Years 2, 3 and 4, 18 credit hours are to be selected from one department which represents a field of application such as: Actuarial Mathematics, Botany, Microbiology, Zoology, Economics, Psychology or Sociology. (Mathematics and Computer Science are excluded from this list.) In consultation with the department, combinations of courses from a coherent area of studies may be selected.

⁴ 15 credit hours are to be taken from either, Computer Science and Mathematics, or from one of the following departments: Actuarial Mathematics, Botany, Microbiology, Zoology, Economics, Psychology or Sociology.

⁵ STAT 3400 and STAT 3800 have corequisites of MATH 2720 and MATH 2730. Therefore students who wish to take STAT 3400 and STAT 3800 should consider taking MATH 1300, MATH 1500 and MATH 1700 in University 1 or Year 2, as they are prerequisite to MATH 2720 and MATH 2730.

Current Four Year Major Program:

(Strikethroughs to be deleted from the program)

FOUR YEAR MAJOR ^{1,6} 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
STAT 1000, MATH 1690 (or MATH 1500 ² and MATH 1700 ³), MATH 1300 ²	STAT 2400, MATH 2720, MATH 2730	STAT 3120 , STAT 3130 , STAT 3500 , STAT 4520, STAT 4530 STAT 3600	
The following courses must be taken in University 1 or Year 2 COMP 1010, STAT 2000 (C+), MATH 1200		Plus 15 credit hours from STAT 3010 , STAT 3050 , STAT 3170, STAT 3180 , STAT 3380, STAT 3490, STAT 4140 , STAT 4170, STAT 4580, STAT 4590, STAT 4600, STAT 4620 , STAT 4630, STAT 4690, STAT 4700	
6 credit hours from the Faculty of Arts, which should include the required "W" course		Plus 15 additional credit hours from list below ⁴	
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ The courses required in this program satisfy the University Mathematics requirement.

² MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700. MATH 2352 may be taken in place of MATH 2300.

³ Of the electives required in Years 2, 3 and 4, 18 credit hours are to be selected from one department which represents a field of application such as: Actuarial Mathematics, Botany, Microbiology, Zoology, Economics, Psychology or Sociology. (Mathematics and Computer Science are excluded from this list.) In consultation with the department, combinations of courses from a coherent area of studies may be selected.

⁴ 15 credit hours are to be taken from either, Computer Science and Mathematics, or from one of the following departments: Actuarial Mathematics, Botany, Microbiology, Zoology, Economics, Psychology or Sociology.

⁵ STAT 3500 and STAT 3600 have corequisites of MATH 2720 and MATH 2730. Therefore students who wish to take STAT 3400 and STAT 3800 should consider taking MATH 1300, MATH 1500 and MATH 1700 in University 1 or Year 2, as they are prerequisite to MATH 2720 and MATH 2730.

⁶ IMPORTANT: The four year Major program need not be completed in the manner prescribed in the chart above. The chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their program.

Proposed Four Year Major Program:

(Bolded to be added to the program)

FOUR YEAR MAJOR ^{1,6} 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
STAT 1000, MATH 1690 (or MATH 1500 ² and MATH 1700 ³), MATH 1300 ²	STAT 2400, MATH 2300, MATH 2720 ² , MATH 2730 ²	STAT 3050, STAT 3470, STAT 3480, STAT 4100, STAT 4200, STAT 4520 STAT 3400, STAT 3800	STAT 4530
The following courses must be taken in University 1 or Year 2 COMP 1010, STAT 2000 (C+), MATH 1200		Plus 15 credit hours from STAT 3170, STAT 3380, STAT 3490, STAT 4170, STAT 4580, STAT 4590, STAT 4600, STAT 4630, STAT 4690, STAT 4700	
6 credit hours from the Faculty of Arts, which should include the required "W" course		Plus 6 credit hours from MATH 2202, MATH 2600, MATH 2800, MATH 3230, MATH 3540, MATH 3600, MATH 3700, MATH 3740, MATH 3800, MATH 3810	
		Plus 12 additional credit hours from list below ⁴	
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ The courses required in this program satisfy the University Mathematics requirement.

² MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700. MATH 2352 may be taken in place of MATH 2300; MATH 2750 can be taken in place of MATH 2720 and MATH 2730.

³ Of the electives required in Years 2, 3 and 4, 18 credit hours are to be selected from one department which represents a field of application such as: Actuarial Mathematics, Botany, Microbiology, Zoology, Economics, Psychology or Sociology. (Mathematics and Computer Science are excluded from this list.) In consultation with the department, combinations of courses from a coherent area of studies may be selected.

⁴ 15 credit hours are to be taken from either, Computer Science and Mathematics, or from one of the following departments: Actuarial Mathematics, Botany, Microbiology, Zoology, Economics, Psychology or Sociology.

⁵ STAT 3400 and STAT 3800 have corequisites of MATH 2720 and MATH 2730. Therefore students who wish to take STAT 3400 and STAT 3800 should consider taking MATH 1300, MATH 1500 and MATH 1700 in University 1 or Year 2, as they are prerequisite to MATH 2720 and MATH 2730.

⁶ IMPORTANT: The four year Major program need not be completed in the manner prescribed in the chart above. The chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their program.

Current Minor requirements:

(Strikethroughs to be deleted as Minor requirements)

MINOR

STAT 1000

STAT 2000

Plus 12 credit hours from ~~STAT 2400, STAT 3010, STAT 3050, STAT 3120,
STAT 3130, STAT 3170, STAT 3180, STAT 3380, STAT 3490, STAT 3500¹,
STAT 3600¹, STAT 4600, STAT 4630, STAT 4690~~

NOTES:

¹ The courses required in this program satisfy the University Mathematics requirement.

² STAT 3400 and STAT 3800 have corequisites of MATH 2720 and MATH 2730. Therefore students who wish to take STAT 3400 and STAT 3800 should consider taking MATH 1300, MATH 1500 and MATH 1700 in University 1 or Year 2, as they are prerequisite to MATH 2720 and MATH 2730.

Proposed Minor requirements:

(Bolded to be added as Minor requirements)

MINOR

STAT 1000

STAT 2000

STAT 3000

Plus 9 additional credit hours of 2000, 3000, or 4000 level Statistics courses²

NOTES:

¹ The courses required in this program satisfy the University Mathematics requirement.

² STAT 3400 and STAT 3800 have corequisites of MATH 2720 and MATH 2730. Therefore students who wish to take STAT 3400 and STAT 3800 should consider taking MATH 1300, MATH 1500 and MATH 1700 in University 1 or Year 2, as they are prerequisite to MATH 2720 and MATH 2730.

The following program charts have been changed to reflect the deletions of STAT 3500, STAT 3600 and STAT 4140. They will be replaced in these programs with STAT 3400, STAT 3800, and STAT 4100. No change in credit hours. Primarily changes in title, and some content.

Current Stats-Actuarial Joint Honours Program:

5.13.4 Statistics - Actuarial Mathematics Joint Honours Program, Code: 005A

The Department of Statistics and the Warren Centre for Actuarial Studies and Research offer a joint Honours program for students wishing in depth study in Statistics and Actuarial Mathematics.

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS³ 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
ECON 1200 (B) MATH 1690(B) (or MATH 1500 ¹ and MATH 1700 ¹ (B)), STAT 1000 (B), STAT(B) MATH 2750 (or MATH 2720 and 2000 (B) and required 'W' course (B) MATH 2730), MATH 2300 ⁵	ACT 2120, ACT 2020, STAT 2400, STAT 3500, ACC 1100 ⁴ (B) FIN 2200 ⁴	STAT 3050, STAT 3470 (B) and STAT 3480, STAT 3600, ACT 3130, ACT 3230, ACT 3530, COMP 1260 ⁷ and MSCI 2150 ⁷	STAT 3490 (B), STAT 4140, STAT 4520, STAT 4530, ACT 4140, ACT 4150, ACT 4240, ACT 4000, ACT 4340
Plus 3 credit hours from the Faculty of Arts if a 3 credit hour 'W' is taken	Plus 3 credit hours of approved electives	Plus 3 credit hours of approved electives	Plus 3 credit hours of approved electives
Plus 3 credit hours of electives			
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ MATH 1310 may be taken in place of MATH 1300; MATH 1510, MATH 1520 or MATH 1530 may be taken in place of MATH 1500; MATH 1710 or MATH 1730 may be taken in place of MATH 1700.

² It is strongly recommended that students take a minimum of 21 credit hours in YEAR 3

³ The courses required in this program satisfy the university mathematics requirement.

⁴ ACC 1100 and FIN 2200 may be taken in Year 2, 3 or 4; however, it is strongly recommended that these two courses be taken in Year 2 or 3. Note that ACC 1100 is a prerequisite for FIN 2200.

⁵ MATH 2352 may be taken in place of MATH 2300 and may be taken in Year 2, 3 or 4

⁶ It is strongly recommended that students take a minimum of 27 credit hours in YEAR 4

⁷ COMP 1260 and MSCI 2150 may be taken in Year 2, 3 or 4. Note that COMP 1260 is a prerequisite for MSCI 2150.

(Letters in brackets indicate minimum prerequisite standing for further study.)

Proposed Stats-Actuarial Joint Honours Program:

5.13.4 Statistics - Actuarial Mathematics Joint Honours Program, Code: 005A

The Department of Statistics and the Warren Centre for Actuarial Studies and Research offer a joint Honours program for students wishing in depth study in Statistics and Actuarial Mathematics.

UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS³ 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
ECON 1200 (B) MATH 1690(B) (or MATH 1500 ¹ and MATH 1700 ¹ (B)), STAT 1000 (B), STAT(B) MATH 2750 (or MATH 2720 and 2000 (B) and required 'W' course (B) MATH 2730), MATH 2300 ⁵	ACT 2120, ACT 2020, STAT 2400, STAT 3400, ACC 1100 ⁴ (B) FIN 2200 ⁴	STAT 3050, STAT 3470 (B) and STAT 3480, STAT 3800, ACT 3130, ACT 3230, ACT 3530, COMP 1260 ⁷ and MSCI 2150 ⁷	STAT 3490 (B), STAT 4100, STAT 4520, STAT 4530, ACT 4140, ACT 4150, ACT 4240, ACT 4000, ACT 4340
Plus 3 credit hours from the Faculty of Arts if a 3 credit hour 'W' is taken	Plus 3 credit hours of approved electives	Plus 3 credit hours of approved electives	Plus 3 credit hours of approved electives
Plus 3 credit hours of electives			
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700.

² It is strongly recommended that students take a minimum of 21 credit hours in YEAR 3

³ The courses required in this program satisfy the university mathematics requirement.

⁴ ACC 1100 and FIN 2200 may be taken in Year 2, 3 or 4; however, it is strongly recommended that these two courses be taken in Year 2 or 3. Note that ACC 1100 is a prerequisite for FIN 2200.

⁵ MATH 2352 may be taken in place of MATH 2300 and may be taken in Year 2, 3 or 4

⁶ It is strongly recommended that students take a minimum of 27 credit hours in YEAR 4

⁷ COMP 1260 and MSCI 2150 may be taken in Year 2, 3 or 4. Note that COMP 1260 is a prerequisite for MSCI 2150.

(Letters in brackets indicate minimum prerequisite standing for further study.)

Current Stats-Math Joint Honours program:

5.13.5 Statistics - Mathematics Joint Honours Program, Code: 005M

UNIVERSITY 1	YEAR 2	YEAR	YEAR 4
JOINT HONOURS⁵ 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
MATH 1300 ¹ (B), MATH 1690(B) (or MATH 1500 ¹ and MATH 1700 ¹ (B)), Plus 9 credit hours	STAT 2000 ⁴ , STAT 2400, MATH 2202, MATH 2352, MATH 2600, MATH 2750, MATH 2800 Plus 3 approved credit hours	STAT 3050, STAT 3470, STAT 3480, STAT 3500, STAT 3600 Plus 3 approved credit hours	STAT 4140 ² , STAT 4520; STAT 4530 ³ Plus 6 approved credit hours
The following courses must be taken in University 1 or Year 2: COMP 1010 ² , STAT 1000 (B) 6 credit hours from the Faculty of Arts, which should include the required "W" course		Plus a total of 30 credit hours from MATH 2400 and any 3000 and 4000 level Mathematics courses, which must include at least 3 credit hours at the 4000 level and must also include MATH 3230, MATH 3740 (or MATH 3760), MATH 3350 (or MATH 3300), MATH 3700 (or MATH 3710), MATH 3400 and MATH 3800	
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ MATH 1310 may be taken in place of MATH 1300; MATH 1510, MATH 1520 or MATH 1530 may be taken in place of MATH 1500; MATH 1710 or MATH 1720 may be taken in place of MATH 1700.

² May be taken in Year 2

³ May be taken in Year 3.

⁴ STAT 2000 may be taken in University 1.

⁵ The courses required in this program satisfy the university mathematics requirement.

(Letters in brackets indicate minimum prerequisite standing for further study.)

Proposed Stats-Math Joint Honours program:

5.13.5 Statistics - Mathematics Joint Honours Program, Code: 005M

UNIVERSITY 1	YEAR 2	YEAR	YEAR 4
JOINT HONOURS⁵ 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
MATH 1300 ¹ (B), MATH 1690(B) (or MATH 1500 ¹ and MATH 1700 ¹ (B)), Plus 9 credit hours	STAT 2000 ⁴ , STAT 2400, MATH 2202, MATH 2352, MATH 2600, MATH 2750, MATH 2800 Plus 3 approved credit hours	STAT 3050, STAT 3470, STAT 3480, STAT 3400, STAT 3800 Plus 3 approved credit hours	STAT 4100, STAT 4520, STAT 4530 ³ Plus 3 approved credit hours
The following courses must be taken in University 1 or Year 2: COMP 1010 ² , STAT 1000 (B) 6 credit hours from the Faculty of Arts, which should include the required "W" course		Plus a total of 30 credit hours from MATH 2400 and any 3000 and 4000 level Mathematics courses, which must include at least 3 credit hours at the 4000 level and must also include MATH 3230, MATH 3740 (or MATH 3760), MATH 3350 (or MATH 3300), MATH 3700 (or MATH 3710), MATH 3400 and MATH 3800	
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ MATH 1310 may be taken in place of MATH 1300; MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1710 may be taken in place of MATH 1700.

² May be taken in Year 2

³ May be taken in Year 3.

⁴ STAT 2000 may be taken in University 1.

⁵ The courses required in this program satisfy the university mathematics requirement.

(Letters in brackets indicate minimum prerequisite standing for further study.)

Minors

The Faculty is proposing modification to sections 3.7 and 5.14 of the Science section of the General Calendar with respect to acceptable minors in Science.

MISCELLANEOUS CHANGES

**Faculty of Science
2009-2010**

Changes to the wording of Sections 3.7 and 5.14 of the Science portion of the General Calendar with respect to Minors in Science. (Changes noted in bold and underlined)

3.7 Minor

Students in B.Sc. Major and Honours programs may, if they wish, declare and complete a Minor from any department and interdisciplinary program at the University of Manitoba which offers a listed Minor. In the Faculty of Science these are listed in the program charts for each department or interdisciplinary program. Available Minors can be found within the appropriate sections of the departmental/school/faculty offerings. Completion of a Minor is entirely optional. Students may not, however, declare both their Major and Minor from the same department/interdisciplinary program. It should be noted that for Honours students any consideration of completing a Minor should be made early due to restricted opportunities in later years of their programs. Completion of a Minor may, in fact, require that a student take more than the minimum number of credit hours for graduation.

The Minor is not available to students in the General degree program.

A Minor will normally consist of a minimum of 18 credit hours, with a minimum of 12 credit hours being at the 2000, 3000 and 4000 level (although there are some exceptions). It should be noted that no course can be used as part of a prescribed Honours or Major program and also be part of a prescribed Minor. An alternate course will have to be selected to satisfy the Minor requirement. For example: if a course in Economics is part of a student's Major or Honours program in Statistics, then that course may **not** be used as part of a Minor in Economics.

5.14 Courses Offered in Other Faculties and Schools Acceptable for Credit in the Faculty of Science

All courses acceptable for credit in any degree program at the University of Manitoba are acceptable for credit in Science (excludes Pass/Fail courses) subject to overall degree requirements. All courses will be included on admission to the Faculty and will be applied toward the elective requirement in all degree programs offered in Science. For course descriptions, including any prerequisites and/or restrictions, see the chapter entitled Course Descriptions in this Calendar.

5.14.1 Minors from Departments and Faculties Outside of Science

Students wishing to complete a minor from a Faculty or School other than the Faculty of Science as part of their 4-year degree should refer to the specific departmental/school/faculty section of the General Calendar for a listing of courses required to fulfill the specific Minor.

Minors can be selected from the following Faculties. For further information about courses required for the completion of a specific Minor, please refer to the section of the calendar that relates to the chosen area.

Agricultural and Food Sciences; Arts; Environment, Earth and Resources; Human Ecology; Kinesiology and Recreation Management. In addition, requirements for minors in Management, Music and Art History are listed below.

Collège universitaire de Saint-Boniface

Psychology

Course introduction:

PSYC 3131 Psychologie de santé Cr.Hrs.3

+3

Introduction au domaine de la psychologie de la santé. On y étudie comment les interactions complexes entre des facteurs environnementaux, psychologiques, neurologiques et immunitaires contribuent au maintien de la santé et, par conséquent, au développement des maladies. Préalables: une note minimale de C dans le PSYC 1200 (ancien 017.120) ou le PSYC 1201 (ancien 017.120)) ou une note minimale de C dans tous les deux PSYC 1211 (ancien 017.121) et PSYC 1221 (ancien 017.122). L'étudiant(e) ne peut se faire créditer à la fois le PSYC 3131 et le PSYC 3130.

Mathematics

Course introductions:

MATH 0401 Habiletés mathématiques Cr.Hrs. 0

0

Ce cours a été conçu principalement, mais non exclusivement, en fonction des besoins d'étudiants se préparant à suivre des cours d'informatique, de mathématiques, de statistiques ou de physique de niveau universitaire, sans avoir réussi le préalable normal, le Mathématiques 40S. L'étudiant va y apprendre à appliquer des outils mathématiques à des situations élémentaires, puis computationnellement plus compliquées. Les leçons magistrales comporteront une révision des concepts fondamentaux, des exemples, des résolutions de problèmes pratiques, des applications et de la rétroaction. Ce cours ne comporte aucun crédit universitaire; il n'est pas conçu pour remplacer le Mathématiques 40S comme condition d'admission à certains cours de niveau 1000; un résultat de C (60%) est requis au MATH 0401. Préalable: autorisation par le chef du secteur des sciences mathématiques au Collège. Selon le niveau de réussite au test de dépistage en mathématiques administré au Collège, l'étudiant peut être contraint de suivre ce cours avant d'être autorisé à s'inscrire à des cours ayant le préalable Mathématiques 40S.

MATH 3821 Introduction à la modélisation mathématique 1 Cr.Hrs. 3

+3

(L'ancien 136.382) Une introduction aux principes et aux techniques entourant le design, le développement, la résolution, l'expérimentation et la révision de modèles mathématiques de phénomènes du "vrai monde" à l'aide d'études de cas. Préalables: MATH 2600 ou MATH 2601, puis MATH 2800 ou MATH 2801 (ou l'ancien 136.280) (C). Préalable ou concomitant: STAT 1000 ou STAT 1001. Donné seulement au Collège universitaire de Saint-Boniface. L'étudiant(e) ne peut se faire créditer à la fois le MATH 3821 et le MATH 3820.

MATH 4921 Sujets choisis en mathématiques Cr.Hrs. 3

+3

(L'ancien 136.492) Sujets d'intérêt courant en mathématiques ou en mathématiques appliquées, selon les besoins et intérêt des étudiants et professeurs, incluant notamment des sujets spécialisés non disponibles dans les autres cours offerts par le secteur. Préalable: autorisation par le chef du secteur des sciences mathématiques. Donné seulement au Collège universitaire de Saint-Boniface. L'étudiant(e) ne peut se faire créditer à la fois le MATH 4921 et le MATH 4920.

Course modifications:

MATH 1191 Sujets choisis en mathématiques

(Ancien 136.119) Ce cours offre aux étudiants de diverses facultés un aperçu des mathématiques modernes. Les sujets étudiés sont tirés des systèmes de nombres, de la géométrie et de la combinatoire. Ce cours est terminal et ne peut être reconnu comme préalable à aucun autre cours universitaire en mathématiques. Ce cours ne peut pas être reconnu aux fins d'un programme spécialisé ou général, majeure ou mineure en sciences mathématiques. L'inscription est interdite à tout étudiant ayant obtenu une note de C ou mieux dans un quelconque cours de mathématiques, à l'exception des cours MATH 1010 (136.101) ou MATH 1020 (FA 1020, 136.102, 054.102). Ce cours ne peut pas être suivi en même temps qu'un autre cours de mathématiques, à l'exception des cours MATH 1010 ou MATH 1020 (FA 1020). Aucun préalable. Donné seulement au Collège de Saint-Boniface.

MATH 1201 Éléments de mathématiques discrètes

(Ancien 136.120) Suites et séries, trigonométrie, nombres complexes, algèbre de polynômes, approximation des zéros de fonctions, équations aux différences. On ne peut se faire créditer le MATH 1201 et le MATH 2120. L'inscription est interdite à tout étudiant ayant obtenu des crédits de niveau 2000 ou plus en mathématiques, à moins que le cours MATH 2101 soit obligatoire dans le programme de l'étudiant. Préalable: Mathématiques 40S (précalcul) ou l'ancien Mathématiques 40S (300) avec une note minimale de 60%, ou une note minimale de C dans le MATH 1001 (ancien 136.100) ou le cours Mathematical Skills offert par la Continuing Education Division de l'Université du Manitoba, ou le cours Habiletés mathématiques offert au Collège universitaire de Saint-Boniface.

MATH 1301 Géométrie vectorielle et algèbre linéaire

(Ancien 136.130) Introduction aux vecteurs, aux matrices, aux systèmes d'équations linéaires et à la géométrie à trois dimensions. On ne peut se faire créditer le MATH 1301 et les MATH 1310 (ancien 136.131), MATH 1680 (ancien 136.168), MATH 1210 (ancien 136.121). Préalable: Mathématiques 40S (précalcul) ou l'ancien Mathématiques 40S (300) avec une note minimale de 60%, ou une note minimale de C dans le MATH 1001 (ancien 136.100) ou le cours Mathematical Skills offert par la Continuing Education Division de l'Université du Manitoba, ou le cours Habiletés mathématiques offert au Collège universitaire de Saint-Boniface.

MATH 1501 Introduction au Calcul

(Ancien 136.150) Différentiation et intégration des fonctions élémentaires avec application à la théorie des extrêmes, aux taux de changements ainsi qu'aux aires et aux volumes. On ne peut se faire créditer le MATH 1501 (ancien 136.150) et les MATH 1510 (ancien 136.151), MATH 1520 (ancien 136.152), ancien 136.153, MATH 1680 (ancien 136.168), MATH 1690 (ancien 136.169). Préalable: Mathématiques 40S (précalcul) ou l'ancien Mathématiques 40S (300) avec une note minimale de 60%, ou une note minimale de C dans le MATH 1001 (ancien 136.100) ou le cours Mathematical Skills offert par la Continuing Education Division de l'Université du Manitoba, ou le cours Habiletés mathématiques offert au Collège universitaire de Saint-Boniface.

MATH 1701 Calcul 2

(Ancien 136.170) Théories et techniques d'intégration, traces de courbes, calculs de volume, de longueur d'arc, d'aires et des dérivées partielles. On ne peut se faire créditer le MATH 1701 et les MATH 1690 (ancien 136.169), MATH 1710 (ancien 136.171), ancien 136.173. Préalable: MATH 1501 ou MATH 1500 (ancien 136.150), MATH 1510 (ancien 136.151), MATH 1520 (ancien 136.152), l'ancien 136.153 ou l'ancien MATH 1680 (ancien 136.168).

MATH 2301 Algèbre linéaire 2

(Ancien 136.230) Suite du MATH 1301 (ancien 136.131 ou 013.146). Espaces vectoriels à dimensions finies, transformations linéaires et matrices; vecteurs réels et valeurs réelles. La diagonalisation et ses applications. Espaces avec produits scalaires. On ne peut se faire créditer le MATH 2301 et les MATH 2350 (ancien 136.235), MATH 3130. Préalables: MATH 1301 ou MATH 1300 (ancien 136.130), MATH 1310 (ancien 136.131), et un de MATH 1501 ou MATH 1500 (ancien 136.150), MATH 1510 (ancien 136.151), MATH 1520 (ancien 136.152), l'ancien 136.153 ou MATH 1690 (ancien 136.169).

MATH 2501 Introduction à la théorie des nombres

(Ancien 136.250) Étude de la divisibilité, de la factorisation unique, des congruences linéaire et quadratique et de theorem de Fermat. Préalable: une note minimale de C dans un cours d'introduction en sciences mathématiques à l'exception de MATH 1000 (ancien 136.100), MATH 1010 (ancien 136.101), MATH 1020 (ancien 136.102), FA 1020 (ancien 054.102) et MATH 1191 ou MATH 1190 (ancien 136.119) ou l'autorisation écrite du department de mathématiques.

MATH 2551 Géométrie modern

(Ancien 136.255) Approche modern à la géométrie à l'aide de transformations géométriques. Sujets varies, tels isométries, symmetries, similarities, inversion circulaire et groupes. Préalables: MATH 1690 (ancien 136.169) ou un de MATH 1501, MATH 1500 (ancien 136.150), MATH 1510 (ancien 136.151), MATH 1520 (ancien 136.152), ancien 136.153; aussi, un de MATH 1301, MATH 1300 (ancien 136.130), MATH 1310 (ancien 136.131), MATH 1701 ou MATH 1700 (ancien 136.170), MATH 1710 (ancien 136.171), ancien 136.173.

MATH 2601 Mathématiques numériques 1

(Ancien 136.260) Techniques élémentaires de solution numérique de problems mathématiques: solution d'équation; differences finies; interpolation, systems d'équations; differentiation numérique; integration numérique. On ne peut se faire créditer le MATH 2601 et le MATH 2120. Préalables: MATH 1301 ou MATH 1300 (ancien 136.130) ou MATH 1310 (ancien 136.131), MATH 1690 (ancien 136.169), MATH 1701 ou MATH 1700 (ancien 136.170), MATH 1710 (ancien 136.171) ou ancien 136.173; et COMP 1011 ou COMP 1010 (ancien 074.101) ou son equivalent, ou l'autorisation écrite du professeur.

MATH 2721 Calcul à plusieurs variables

(Ancien 136.270) Calcul différentiel et integral à plusieurs variables. On ne peut se faire créditer le MATH 2721 et le MATH 2751 (ancien 136.275) ou le 137.270 ou le MATH 2110 (ancien 136.211) ou le MATH 2130. Préalables: le MATH 1301 ou MATH 1300 (ancien 136.130) ou MATH 1311 ou MATH 1310 (ancien 136.130)(ou l'ancien 013.146) et un de MATH 1691 (ancien 136.169), MATH 1701 (ancien 136.170), MATH 1711 (ancien 136.171) ou l'ancien 136.173 ou l'ancien 136.173.

MATH 2731 Suites et series

(Ancien 136.271) Analyse, suites et series. On ne peut se faire créditer le MATH 2731 et le MATH 2750 (ancien 136.275), ou le 136.271 ou le MATH 2132 ou le MATH 2100 (ancien 136.210). Préalables: un de MATH 1690 (ancien 136.169), MATH 1701 ou MATH 1700 (ancien 136.170), MATH 1711 ou MATH 1710 (ancien 136.171) ou MATH 1731 (ancien 136.173). Concomitant: le MATH 1301 (ancien 136.130) ou le MATH 1311 (ancien 136.131).

MATH 2801 Équations différentielles ordinaires et leur applications I

(Ancien 136.280) Introduction à la théorie des equations différentielles ordinaires. Techniques pratiques de solution, principalement en ce qui a trait aux equations du premier ordre et aux equations linéaires d'ordre plus élevé. Systèmes linéaires. Applications à des problems en sciences

ou à d'autres domaines. On ne peut se faire créditer le MATH 2801 et le MATH 2132 ou le MATH 2100 (ancien 136.210). Préalable: MATH 1301 ou MATH 1300 (ancien 136.130) ou MATH 1310 (ancien 136.131). Concomitant: MATH 2721 ou MATH 2750.

MATH 3601 Mathématiques numériques 2

(Ancien 136.260) Différentiation numérique, quadrature gaussienne, lissage à l'aide de splines, méthodes numériques pour les problèmes à valeurs initiales et problèmes aux frontières, transformations, problèmes où interviennent les systèmes de grande taille, épars ou mal conditionnés. Préalables: MATH 2601 ou MATH 2600 (ancien 136.260), MATH 2801 ou MATH 2800 (ancien 136.280), MATH 2721 ou MATH 2720 (ancien 136.272) et MATH 2731 ou MATH 2730 (ancien 136.271) ou MATH 2750 (ancien 136.275) et COMP 1011 ou COMP 1010 (ancien 074.101) ou l'autorisation écrite du département de mathématiques.

Traduction

Course modifications:

TRAD 3461 Littérature et civilisation d'Amérique latine Cr.Hrs. 3

(ancien 122.346) Initiation aux grands auteurs d'Amérique latine, ainsi qu'aux caractères spécifiques des sociétés latino-américaines: valeurs, pratiques culturelles mais aussi politiques, commerciales et professionnelles. Préalable: une note minimale de C dans le TRAD 2361 (122.236) ou le TRAD 2571 (122.257).

TRAD 3561 Cours avancé d'espagnol professionnel Cr.Hrs. 3

(ancien 122.3561) Pratique de la Traduction de l'espagnol vers le français et du français vers l'espagnol à partir de textes pragmatiques à caractère professionnel. Préalable: une note minimale de C dans le TRAD 2361 (122.236) ou le TRAD 2571 (122.257).

NET CHANGE IN CREDIT HOURS:

+9



UNIVERSITY
OF MANITOBA

Registrar's Office

400 University Centre
Winnipeg, Manitoba
Canada R3T 2N2
Telephone (204) 474 9420
Fax (204) 275-2589

Date: November 24, 2008

Memo To: Senate

From: Neil Marnoch, Registrar

Re: Revisions to the Proposed Academic Schedule for 2009-2010

As a result of concerns raised at the Senate Executive Meeting November 19/08 regarding the date of the beginning of Winter 2010 Term, the revisions listed below have been made. The result will be that classes will begin one day after the university re-opens following the Christmas break. Classes taught on the normal Tuesday/Thursday lecture schedule will include 37½ contact hours. Courses taught on the normal Monday/Wednesday/Friday lecture schedule will include 37 contact hours. Each is consistent with past practice for teaching hours available in an academic term. Several changes to the schedule as circulated to faculties have been made as a result.

Section 2 - The first day of classes for Winter Term 2010 has been revised to Wednesday, January 6 from Tuesday, January 5.

- Winter Term 2010 classes in the Agriculture Diploma program will also begin on January 6. Winter Term for Agriculture Diploma classes will end on Tuesday, March 30 instead of Monday, March 29 as initially proposed.

Section 3 - The deadline for class registration revisions for Winter Term 2010 has been changed to Tuesday, January 19 from Monday, January 18.

- The last day to add classes for the Winter Term in the Agriculture Diploma program has been moved to Monday, January 18 from Friday, January 15.

- Moving the start date of the term necessitates a change to the deadline for Voluntary Withdrawal to Friday, March 19 from Thursday, March 18.

- The Voluntary Withdrawal deadline for Agriculture Diploma courses has been moved to Thursday, March 11 from Wednesday, March 10.

Section 6 - The Examination Period for Agriculture Diploma has been changed to April 1 through April 9, from March 31 through April 8.

Section 11 - Winter/Summer Distance Education courses will commence January 6 and end July 6. Examinations for these courses will be held July 7 to 9, 2010.

Comments of the Senate Executive Committee:
The Senate Executive Committee endorses the report to Senate.

2009-2010 Academic Schedule

Note: Admission Application Deadlines may be found on the web at
www.umanitoba.ca/student/admissions

Chapter Contents

- Section 1: Orientation Sessions for Fall/Winter Session**
- Section 2: Start and End Dates for Fall/Winter Session**
- Section 3: Registration and Withdrawal Dates**
- Section 4: Fee Deadlines**
- Section 5: Dates of University Closure and Mid Term Break**
- Section 6: Fall/Winter Session Examination and Test Dates**
- Section 7: Challenge for Credit, Supplemental and Other Special Examinations and Tests**
- Section 8: Grade Appeal Dates**
- Section 9: University Convocation**
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- Section 12: Summer Session 2009 Start and End Dates**
- Section 13: Summer Session 2010**
- Section 14: Graduate Studies Submission Dates**

Section 1: Orientation Sessions for Fall/Winter Session

IDDP Year 1	May-June 2009
University 1	Sept. 8-9, 2009
Agriculture Diploma	Sept. 18, 2009
School of Art Orientation	Sept. 8-9, 2009
Education, Year 1	Aug. 27, 2009
Education, Year 2 and Year 5 Integrated	Aug. 27, 2009
Medicine, Year 1	Aug. 18, 2009
Medicine Inaugural Exercises	Aug. 19, 2009
Music	Sept. 8, 2009
Nursing, Year 2 (2180)	
Tuesday/Wednesday clinical orientation	Sept. 1, 2009
Nursing, Year 2 (2190)	
Tuesday/Wednesday clinical orientation	Sept. 1, 2009
Nursing, Year 2 (2180)	
Thursday/Friday clinical orientation	Sept. 3, 2009
Nursing, Year 2 (2190)	
Thursday/Friday clinical orientation	Sept. 3, 2009
Nursing, Year 2 (2180 continues)	
Tuesday/Wednesday clinical orientation continues	Sept. 8, 2009
Nursing, Year 2 (2180 continues)	
Thursday/Friday clinical orientation continues	Sept. 10, 2009
Nursing, Year 2 (2190 continues)	
Both rotations clinical orientation continues	Sept. 10, 2009
Nursing, Year 2 (2180 and/or 2190)	
Tuesday/Wednesday clinical begins	Sept. 15, 2009
Nursing, Year 2 (2180 and/or 2190)	
Thursday/Friday clinical begins	Sept. 10, 2009
Nursing, Year 3 clinical orientation	
Tuesday/Wednesday clinical rotation begins	Sept. 29, 2009
Nursing, Year 3 clinical orientation	
Thursday/Friday clinical rotation begins	Sept. 24, 2009
Nursing, Year 4 clinical orientation	Sept. 10, 2009
Nursing Lectures in NURS 2120 (Health Assessment) and Nursing labs in NURS 2120 (Health Assessment) and NURS 2130 (Skills Year2), NURS 3280 (Skills Year 3) start week of Sept. 14, 2009	

NOTE: Immunizations/CPR due for all newly admitted Aug. 1, 2009	
Nursing students	
Occupational Therapy, Year 1 Linking Week	Aug. 20 - 21, 2009
Pharmacy, Year 1 orientation session	Sept. 9, 2009
Kinesiology and Recreation Management	June 24 & July 2, 2009
Social Work, Year 1	Sept. 9, 2009
Social Work, Year 2 and 3 Field Orientation	Sept. 8 and 9, 2009

Section 2: Start and End Dates for Fall/Winter Session

(Classes, practica, experiences)

The following start and end dates are for students in most faculties and schools.

See Section 5 for mid term break and other university closures.

Students registering for Distance and Online Education courses should consult the Distance and Online Education Calendar available from Distance Education.

Education courses may have unique start and end dates. Students are referred to the Faculty of Education website.

Fall Term 2009 (including full courses)	Start	End
Most faculties and schools	Sept. 10, 2009	Dec. 9, 2009
Agriculture diploma	Sept. 21, 2009	Dec. 4, 2009
Dentistry, Years 1 and 2	Aug. 17, 2009	Dec. 4, 2009
Dentistry, Year 3	Aug. 10, 2009	Dec. 4, 2009
Clinics	NA	Dec. 18, 2009
Dentistry, Year 4	Aug. 10, 2009	Dec. 11, 2009
Clinics	NA	Dec. 18, 2009
Dental Hygiene, Year 1	Aug. 24, 2009	Dec. 4, 2009
Clinics	NA	Dec. 4, 2009
Dental Hygiene, Year 2	Aug. 17, 2009	Dec. 4, 2009
Clinics	NA	Dec. 11, 2009
Law	Sept. 8, 2009	Dec. 8, 2009
Medicine, Years 1 and 2	Aug. 24, 2009	T.B.A.
Medicine, Years 3 and 4	Aug. 24, 2009	Dec. 18, 2009
Medicine, B.Sc.	May 25, 2009	Aug. 21, 2009
Occupational Therapy Year 1	Aug. 24, 2009	Nov. 13, 2009
Basic Fieldwork	Nov. 16, 2009	Dec. 11, 2009
Occupational Therapy Year 2	Aug. 24, 2009	Dec. 11, 2009
Pharmacy, Year 4 (classes)	Sept. 8, 2009	Nov. 2, 2009
(Experiential Rotations - Block 1)	Nov. 9, 2009	Dec. 18, 2009
(Electives - Block 1)	Nov. 5, 2009	Dec. 23, 2009
Physical Therapy	Aug. 24, 2009	Dec. 11, 2009
Respiratory Therapy Years 1, 2, 3	Aug. 24, 2009	Dec. 18, 2009
Respiratory Therapy,		
Year 1 Basic Fieldwork	Sept. 25, 2009	Dec. 18, 2009
Year 2 Basic Fieldwork	Sept. 18, 2009	Dec. 11, 2009
Social Work, Field Instruction Years 2 & 3	Sept. 8, 2009	Dec. 11, 2009

Winter Term 2010 (including full courses)	Start	End
Most faculties and schools	Jan. 6, 2010	April 9, 2010
Agriculture Diploma	Jan. 6, 2010	Mar. 30, 2010
Dental Hygiene, Years 1 and 2 classes	Jan. 5, 2010	April 9, 2010
Year 1 clinic	Jan. 5, 2010	April 9, 2010
Year 2 clinic	Jan. 5, 2010	April 23, 2010
Dentistry, Years 1 and 2	Jan. 5, 2010	April 23, 2010
Dentistry, Year 3 classes	Jan. 5, 2010	April 9, 2010
Year 3 clinics	Jan. 5, 2010	April 23, 2010
Dentistry, Year 4 classes	Jan. 5, 2010	Feb. 12, 2010
Year 4 clinics	Jan. 7, 2010	April 23, 2010
Law	Jan. 5, 2010	April 12, 2010
Medicine, Years 1 and 2	TBA	May 21, 2010
Medicine, Year 3	Jan. 5, 2010	Aug. 20, 2010
Medicine, Year 4 Clerkship	Jan. 5, 2010	May 7, 2010

Occupational Therapy Year 1	Jan. 5, 2010	April 30, 2010
Occupational Therapy Year 2		
Intermediate Fieldwork 2	Jan. 4, 2010	Feb. 26, 2010
Occupational Therapy Year 2	Mar. 8, 2010	June 25, 2010
Pharmacy, Year 2, experiential rotations	May 3, 2010	May 14, 2010
Pharmacy, Year 3 Community Practice	April 5, 2010	April 30, 2010
Pharmacy, Year 4,		
(Experiential Rotations - Block 2)	Jan. 4, 2010	Feb. 12, 2010
(Electives - Block 2)	Jan. 4, 2010	Feb. 19, 2010
(Experiential Rotations - Block 3)	Feb. 22, 2010	April 2, 2010
(Electives - Block 3)	Feb. 22, 2010	April 9, 2010
Physical Therapy	Jan. 5, 2010	variable; depends on clinical placements
Resp. Therapy Year 1 Basic Fieldwork	Jan. 15, 2010	Mar. 26, 2010
Resp. Therapy Year 2 Basic Fieldwork	Jan. 8, 2010	Mar. 19, 2010
Respiratory Therapy Years 1 and 2	Jan. 4, 2010	April 30, 2010
Respiratory Therapy Year 3	Jan. 4, 2010	June 25, 2010
Social Work Years 2 and 3 field instruction	Jan. 5, 2010	April 7, 2010

Section 3 Registration and Withdrawal Dates

NOTES: 1. The fee refund schedule may be found in the Calendar in the chapter "Fees, Payments and Refunds".

2. Some courses have irregular Voluntary Withdrawal deadline dates. Please refer to your faculty or school section of the Calendar.

Fall Term 2009 (including full courses)	Start	End
Nursing Clinical Courses: last date to register for Fall Term 2009 and Winter Term 2010	Aug. 19, 2009	
Last Date to register and pay fees without penalty for all programs (except Agriculture Diploma)	Sept. 9, 2009	
Agriculture Diploma	Sept. 18, 2009	
Law: Registration after this date requires Associate Dean's approval	Sept. 8, 2009	
Registration revisions and late registration in all programs (except Agriculture Diploma). A financial penalty is assessed on all late registrations during this period	Sept. 10, 2009	Sept. 23, 2009
Agriculture Diploma	Sept. 21, 2009	Sept. 30, 2009
Last date in all programs (except Agriculture Diploma) to withdraw from Fall Term 2009 and full courses and not be assessed a "VW"		Sept. 23, 2009
Agriculture Diploma		Sept. 30, 2009
Last date in all faculties and schools to Voluntarily Withdraw Fall Term 2009 courses. (See refund schedule for implications).		Nov. 18, 2009
Winter Term 2010		
Registration and Revision period in Winter Term 2010 half courses in all programs (except Agriculture Diploma)	Jan. 6, 2010	Jan. 19, 2010
Agriculture Diploma	Jan. 6, 2010	Jan. 18, 2010
Last date for registration in Winter Term 2010 half courses, including Challenge for Credit, and/or registration revisions in all programs (except Agriculture Diploma)		Jan. 19, 2010
Agriculture Diploma		Jan. 18, 2010
Winter Term 2010 half courses and full courses dropped after this date from any program (except Agriculture Diploma) are recorded as Voluntary Withdrawals		Jan. 19, 2010
Agriculture Diploma		Jan. 18, 2010
Last date for Voluntary Withdrawal from Winter Term 2010 half courses and full courses without academic penalty in all faculties and schools (except Agriculture Diploma). See refund schedule for financial implications.		Mar. 19, 2010
Agriculture Diploma		Mar. 11, 2010

Section 4: Fee Deadlines

Last date for all students to pay Fall Term 2009 and 1st instalment fees without late fee (except Agriculture Diploma) Sept. 9, 2009
Agriculture Diploma Sept. 18, 2009
Last date for all students to pay Winter Term 2010 and 2nd instalment fees without late fee Jan. 7, 2010

Section 5: Dates of University Closure and Mid Term Break

When the University is closed no classes/examinations will be held.	Start	End
Canada Day (Holiday Observed)	July 1, 2009	
Civic Holiday	Aug. 3, 2009	
Labour Day	Sept. 7, 2009	
Thanksgiving Day	Oct. 12, 2009	
Remembrance Day (Holiday Observed)	Nov. 11, 2009	
December Holidays	Dec. 24, 2009	Jan. 4, 2010
Mid-Term Break* for all faculties and schools (except Medicine, Education, Occupational Therapy, Physical Therapy Yr. 3 and Respiratory Therapy Yr. 3)	Feb. 15, 2010	Feb. 19, 2010
Louis Riel Day	Feb. 15, 2010	
Occupational Therapy	Mar. 1, 2010	Mar. 5, 2010
Medicine Years 1 and 2	Mar. 29, 2010	April 2, 2010
Good Friday	April 2, 2010	
Easter Monday (Respiratory Therapy department only)	April 5, 2010	
Victoria Day	May 24, 2010	

*The academic and administrative offices will be open during this period, but there will be no classes/examinations held for students

Section 6: Fall/Winter Session Examination and Test Dates

Students are reminded that they must remain available until all examination and test obligations have been fulfilled.

Fall/Winter Session 2009-2010

Fall Term 2009 (including full courses)	Start	End
Most faculties and schools	Dec. 10, 2009	Dec. 23, 2009
Agriculture Diploma*	Dec. 7, 2009	Dec. 14, 2009
Dentistry, Years 1, 2, and 3	Dec. 7, 2009	Dec. 18, 2009
Dentistry, Year 4	Dec. 14, 2009	Dec. 18, 2009
Dental Hygiene Year 1	Dec. 7, 2009	Dec. 18, 2009
Dental Hygiene Year 2	Dec. 14, 2009	Dec. 18, 2009
Law	Dec. 9, 2009	Dec. 23, 2009
Pharmacy, Year 4	Nov. 3, 2009	Nov. 4, 2009

Winter Term 2010 (including full courses)

Most faculties and schools	April 12, 2010	April 28, 2010
Agriculture Diploma	April 1, 2010	April 9, 2010
Dental Hygiene, Years 1 and 2	April 12, 2010	April 16, 2010
Dentistry, Years 1 and 2	April 26, 2010	May 7, 2010
Year 3	April 12, 2010	April 23, 2010
Year 4	Feb. 22, 2010	Feb. 26, 2010
Law	April 14, 2010	April 28, 2010
Pharmacy, Year 3	Mar. 27, 2010	April 1, 2010
Respiratory Therapy		
Clinical Entrance Exams Year 2	April 30, 2010	
Composite Exams Year 3	June 21, 2010	

Section 7: Challenge for Credit, Supplemental and Other Special Examinations and Tests

Faculties and schools that extend supplemental examination privileges: last date for applications for autumn supplemental examinations	July 2, 2009
Language reading tests for graduate students	Sept. 5, 2009
Last date to apply for Challenge for Credit for courses offered in Fall Term 2009	Sept. 23, 2009
International Dental Degree Program on-site assessment	Dec. 14-18, 2009
Last date to apply for Challenge for Credit for courses offered in Winter Term 2010	Jan. 18, 2010
Agriculture Diploma	Jan. 5, 2010
Last date for applications for Fall Term 2009 supplemental examinations	
Fall term supplementary examinations	Jan. 11, 2010
Language reading tests for graduate students	April 3, 2010
Agriculture Diploma	May 1, 2010
Last date for applications for Winter Term 2010 supplemental examinations	
Winter term supplementary examinations	May 21, 2010
Last day to register for Challenge for Credit for examinations in June series	May 1, 2010
Medical Council of Canada examinations	May 3 -11, 2010

Section 8: Final Grade Appeal Dates

Appeal period for final grades received for Fall Term 2009 courses	Jan. 5, 2010	Jan. 25, 2010
Appeal period for final grades received for Winter Term 2010 courses and full courses	May 25, 2010	June 14, 2010

Section 9: University Convocation

Fall Convocation	Oct. 21-22, 2009
Last date to apply online to graduate in Fall	Aug. 1, 2009
Last date to apply online for graduation in February	Sept. 30, 2009
Last date to apply online to graduate in May	Jan. 30, 2010
Graduation date for students graduating in February 2010 (Ceremony for February grads is in May 2010)	Feb. 3, 2010
School of Agriculture graduation ceremony	April 30, 2010
Faculty of Medicine Convocation ceremony	May 13, 2010
Spring Convocation	June 1, 2, 3, 2010
Convocation ceremony at Collège universitaire de Saint-Boniface	June 7, 2010

Section 10: Other University Special Events

Parents Orientation	June 6, 2009
2009 School Counsellors Admissions Seminar	Sept. 16, 2009
Enrolment Services/Student Recruitment: Evening of Excellence	Oct. 19, 2009
Memorial events for 14 women murdered at l'École Polytechnique in 1989	Dec. 6, 2009
Information Days for high school students	Feb. 16-17, 2010
Annual traditional graduation Powwow in honour of Aboriginal students	May 1, 2010

Section 11: Distance and Online Education 2009/2010 Deadline Dates

Start and End Dates	
Fall term 2009 (including Full Courses)	Refer to Section 2 for start & end dates
Winter Term 2010	Refer to Section 2 for start & end dates
Winter/Summer Term 2010	Jan. 6, 2010 July 6, 2010
Summer Term 2010	May 3, 2010 July 30, 2010
Registration and Withdrawal Dates	
Fall Term 2009 (including full courses)	Refer to Section 3 for registration & withdrawal dates
Winter Term 2010	Refer to Section 3 for registration & withdrawal dates

Winter/Summer Term 2010		
Registration and Revision period	Jan 6, 2010	Jan. 19, 2010
Last date for Voluntary Withdrawal		June 9, 2010
Summer Term 2010		
Registration and Revision period	May 3, 2010	May 14, 2010
Last date for Voluntary Withdrawal		July 9, 2010
Application to write examinations at a location other than the University of Manitoba		
Fall term 2009		First working day of October
Fall/Winter and Winter term 2010		First working day of February
Winter/Summer term 2010		First working day of May
Summer term 2010		First working day of June
Examination and Test Dates		
Fall Term 2009		Refer to Section 6 for examination and test dates
Winter Term 2010		Refer to Section 6 for examination and test dates
Winter/Summer term 2010	July 7, 2010	July 9, 2010
Summer Term 2010	Aug. 3, 2010	Aug. 9, 2010

Section 12: Summer Session 2009

Start and End Dates

For more detailed information, please consult the Summer Session Calendar available from the Summer Session Office, 166 Extended Education Complex. The Summer Session Calendar is available on-line at umanitoba.ca/summer.

May Day, June Day	Start	End
Classes	May 4, 2009	June 23, 2009
Examinations		
Term 1	May 29, 2009	May 30, 2009
Term 2 and Full	June 25, 2009	June 26, 2009
May-June Eve, June-Aug. Eve, May-Aug. Eve		
Classes	May 4, 2009	Aug. 6, 2009
Examinations		
Term 1	June 19, 2009	June 20, 2009
Term 2 and Full	Aug. 7, 2009	Aug. 8, 2009
July Day, Aug. Day		
Classes	July 2, 2009	Aug. 20, 2009
Examinations		
Term 1	July 27, 2009	
Term 2 and Full	Aug. 21, 2009	Aug. 22, 2009
Other		
Nursing Summer Term	April 27, 2009	July 29, 2009
Occupational TherapyYear 1 Summer Term		
Intermediate Fieldwork 1	May 4, 2009	June 26, 2009
Occupational TherapyYear 2 Summer Term		
Advanced Fieldwork	June 29, 2009	must end by (flexible start date) Sept. 11, 2009
Physical Therapy Summer Term	variable; depend on clinical placements	

Section 13: Summer Session 2010

Class Start Dates	
Nursing summer term begins	April 26, 2010
Summer Session Start Date	May 3, 2010
Occupational TherapyYear 1 Summer Term	
Intermediate Fieldwork 1	May 3, 2010 - June 25, 2010
Occupational TherapyYear 2 Summer Term	
Advanced Fieldwork	June 28, 2010 - must end by flex. start date Sept. 10, 2010
Physical Therapy Summer Term	variable; depend on clinical placements

The other summer session dates are not available yet.

Section 14: Faculty of Graduate Studies Submission Dates for 2009-2010

For reports on theses/practica (and the corrected copies of the theses/practica), comprehensive examinations and M.Eng. projects to be submitted to Graduate Studies by students expecting to graduate in October

For receipt in Graduate Studies Office of Ph.D. theses (for distribution) from graduate students expecting to graduate in February

For distribution of Master's theses/practica (to examining committee) by students expecting to graduate in February

For reports on theses/practica (and the corrected copies of theses/practica), comprehensive examinations and M.Eng. projects to be submitted to Graduate Studies by students expecting to graduate in February.

For receipt, in Graduate Studies Office, of Ph.D. theses (for distribution) from graduate students expecting to graduate in May.

For distribution of Master's theses/practica (to examining committee) by students expecting to graduate in May

For reports on theses/practica (and the corrected copies of theses/practica), comprehensive examinations and M.Eng. projects to be submitted to Graduate Studies by students expecting to graduate in May

For receipt by the Faculty of Graduate Studies, of Annual Progress Reports for Master's and Ph.D. students

For receipt, in Graduate Studies Office, of Ph.D. theses (for distribution) from students expecting to graduate in October

For distribution of Master's theses/practica (to examining committee) by students expecting to graduate in October

November 24, 2008

REPORT OF THE SENATE COMMITTEE ON AWARDS

Preamble

Terms of reference for the Senate Committee on Awards include the following responsibility:

On behalf of Senate, to approve and inform Senate of all new offers and amended offers of awards that meet the published guidelines presented to Senate on November 3, 1999, and as thereafter amended by Senate. Where, in the opinion of the Committee, acceptance is recommended for new offers and amended offers which do not meet the published guidelines or which otherwise appear to be discriminatory under the policy on the *Non-Acceptance of Discriminatory Scholarships, Bursaries or Fellowships*, such offers shall be submitted to Senate for approval. (Senate, April 5, 2000)

Observations

At its meeting of October 24, 2008, the Senate Committee on Awards approved nine new offers, eight amended offers, and the withdrawal of two offers, as set out in Appendix A of the *Report of the Senate Committee on Awards*.

Recommendations

On behalf of Senate, the Senate Committee on Awards recommends that the Board of Governors approve nine new offers, eight amended offers, and the withdrawal of two offers, as set out in Appendix A of the *Report of the Senate Committee on Awards* (dated October 24, 2008). These award decisions comply with the published guidelines of November 3, 1999, and are reported to Senate for information.

Respectfully submitted,

Dr. Philip Hultin
Chair, Senate Committee on Awards

Appendix A
MEETING OF THE SENATE COMMITTEE ON AWARDS
October 24, 2008

1. NEW OFFERS

Robert J.M. Adkins Prize in Municipal and Planning Law

On the occasion of the 60th birthday of Mr. Robert J.M. Adkins (B.A./70, LL.B./73), his sons Mark R.T. Adkins, Samuel W.C. Adkins, and Matthew A.M. Adkins have established a prize in his honour at the University of Manitoba. An annual prize valued at \$200 will be offered to the Law student who:

- (1) has achieved the highest standing in Municipal and Planning Law (currently numbered LAW 3880); and
- (2) has achieved a minimum degree grade point average of 2.5.

The selection committee will be named by the Dean of the Faculty of Law.

Bison Student AT Awards

The Faculty of Kinesiology and Recreation Management offers annual scholarships to recognize the vital role that student athletic therapists play in the University of Manitoba Bison Athletics program. Each year, a variable number of scholarships valued at \$500 each will be offered to Head Student Therapists, and a variable number of scholarships valued at \$350 each will be offered to Assistant Student Therapists who:

- (1) are enrolled full-time (at least 60% of a full course load) in the Faculty of Kinesiology and Recreation Management, in the Bachelor of Kinesiology – Athletic Therapy program;
- (2) are enrolled in either KIN 3910 – *Athletic Therapy Practicum* or KIN 4910 – *Athletic Therapy Practicum*;
- (3) have achieved a minimum degree grade point average of 3.0;
- (4) have been appointed to serve as either Head Student Therapist or Assistant Student Therapist of a Bison Athletic Team.

The selection committee will be the Undergraduate Academic Awards Committee of the Faculty of Kinesiology and Recreation Management.

Department of Mathematics Entrance Scholarships

The Department of Mathematics offers one or more entrance scholarships, valued at the cost of one half-course (3 credit hours) in University 1, to undergraduate students who:

- (1) have, as a high school student (grades 9 through 11), excelled in any provincial or national mathematics competition recognized by the selection committee;
- (2) are admitted to, and register full-time in, University 1 at the University of Manitoba.

The selection committee will have the discretion to determine the number of scholarships offered each year.

The Department of Mathematics Entrance Scholarships may be held with any other University of Manitoba entrance scholarship except the Manitoba Mathematical Contest Award.

The selection committee for this scholarship will be named by the Head of the Department of Mathematics.

Irena Knysh Graduate Scholarship in Ukrainian Studies

In memory of his mother, Irena Knysh, Dr. George Knysh has established an endowment fund at the University of Manitoba with an initial gift of \$100,000. The fund will be used to offer the Irena Knysh Graduate Scholarship in Ukrainian Studies or, in years where there is no qualified graduate candidate, the Irena Knysh Undergraduate Scholarship in Ukrainian Studies (Award #00000). The scholarships commemorate Irena's life and her many contributions to the Ukrainian women's movement and to the study of Ukrainian history and culture. The available annual interest from the fund will be used to offer one scholarship to a graduate student who:

- (1) is enrolled full-time in the Faculty of Graduate Studies in any Masters or Doctoral program;
- (2) has achieved a minimum degree grade point average of 3.5 (or equivalent) based on the last 60 credit hours of study;
- (3) will write or is writing a thesis in any area of Ukrainian studies.

Preference will be given, in the following order, to students who will use the archives of the Ukrainian Canadian Experience in order to conduct thesis research related to: 1) the life and works of Irena Knysh; 2) the Ukrainian women's movement, with particular attention to its North American (Canada and the United States of America) expression; 3) Ukrainian and Ukrainian Canadian history, politics, and culture.

Candidates will be required to submit an application that will consist of a description of their proposed or ongoing research (maximum 500 words), a current academic transcript(s), and two academic letters of reference from professors at a post-secondary institution.

If, in any given year, there is no suitable Masters or Doctoral student candidate for the award, the Scholarship will be offered to a graduate student who:

- (1) is enrolled full-time in the Faculty of Graduate Studies in any pre-Master's program;
- (2) has achieved a minimum degree grade point average of 3.5 (or equivalent) based on the last 60 credit hours;
- (3) is registered for a minimum of 12 credit hours of course work in the area of Ukrainian studies.

The award is not automatically renewable but previous recipients may apply. The maximum number of scholarships (including the Irena Knysh Graduate Scholarship in Ukrainian Studies and the Irena Knysh Undergraduate Scholarship in Ukrainian Studies) one student may hold in his or her lifetime is four (4).

Graduate student recipients may hold the Irena Knysh Scholarship in Ukrainian Studies concurrently with any other awards, consistent with policies in the Faculty of Graduate Studies.

In any given year that there is no worthy graduate or undergraduate candidate, the unspent interest will be held over and may be used to increase the value of the scholarship offered in the next ensuing academic session. If a scholarship is not offered over two consecutive academic years, the unspent interest will be capitalized.

The selection committee will be named by the Dean of the Faculty of Graduate Studies (or designate) and will include one representative from each of the University of Manitoba Archives and the Ukrainian Academy of Arts and Sciences (UVAN).

The Board of Governors of the University of Manitoba has the right to modify the terms of this award if, because of changed conditions, it becomes necessary to do so. Such modification shall conform as closely as possible to the expressed intention of the donor in establishing the Award.

Irena Knysh Undergraduate Scholarship in Ukrainian Studies

In memory of his mother, Irena Knysh, Dr. George Knysh has established an endowment fund at the University of Manitoba with an initial gift of \$100,000. The fund will be used to offer the Irena Knysh Graduate Scholarship in Ukrainian Studies (Award # 00000) or, in years where there is no qualified graduate candidate, the Irena Knysh Undergraduate Scholarship in Ukrainian Studies. The scholarships commemorate Irena's life and her many contributions to the Ukrainian women's movement and to the study of Ukrainian history and culture.

The Irena Knysh Undergraduate Scholarship in Ukrainian Studies will be offered only in those years when no candidate is named to receive the Irena Knysh Graduate Scholarship in Ukrainian Studies. In those years, the available annual interest from the fund will be used to offer one scholarship to an undergraduate student who:

- (1) is enrolled full-time in the Faculty of Arts in the final year of any degree program;
- (2) has achieved a minimum degree grade point average of 3.5;
- (3) will complete an honours thesis or major paper in the area of Ukrainian studies using the archives of the Ukrainian Canadian Experience.

Preference will be given, in the following order, to students who will use the archives of the Ukrainian Canadian Experience in order to conduct research related to: 1) the life and works of Irena Knysh; 2) the Ukrainian women's movement, with particular attention to its North American (Canada and the United States of America) expression; 3) Ukrainian and Ukrainian Canadian history, politics, and culture.

Candidates will be required to submit an application that will consist of a description of their proposed honours thesis or major paper (maximum 500 words) and one academic letter of reference from a professor at a post-secondary institution.

In any given year that there is no worthy graduate or undergraduate candidate, the unspent interest will be held over and may be used to increase the value of the scholarship offered in the next ensuing academic session. If a scholarship is not offered over two consecutive academic years, the unspent interest will be capitalized.

The selection committee will be named by the Dean of the Faculty of Arts (or designate) and will include the Head of the Department of German and Slavic Studies (or designate) and one representative from each of the University of Manitoba Archives and the Ukrainian Academy of Arts and Sciences (UVAN).

The Board of Governors of the University of Manitoba has the right to modify the terms of this award if, because of changed conditions, it becomes necessary to do so. Such modification shall conform as closely as possible to the expressed intention of the donor in establishing the Award.

Dr. Narain D. Gupta Scholarship in Mathematics

In recognition of Dr. Narain D. Gupta's and Dr. Chander Kanta Gupta's contributions to mathematics over four decades, their friends and family have established an endowment fund at the University of Manitoba with an initial gift of \$19,121. The Manitoba Scholarship and Bursary Initiative has made a contribution to the fund. The available annual income from the fund will be used to offer one scholarship to a graduate student who:

- (1) has completed a Baccalaureate degree at the University of Manitoba with a minimum degree grade point average of 3.5;
- (2) in the third and fourth years of their undergraduate program, has completed at least 24 credit hours of mathematics courses, with a minimum average of 3.5;
- (3) is enrolled full-time in the Faculty of Graduate Studies in the first year of either the M.Sc. in Mathematics or the Ph.D. in Mathematics.

If, in any given year, there is no candidate who meets the requirements set out in the preceding paragraph, the Scholarship will be offered to a graduate student who:

- (1) is enrolled full-time in the Faculty of Graduate Studies in the first year of either the M.Sc. in Mathematics or the Ph.D. in Mathematics;
- (2) has achieved a minimum degree grade point average of 3.5 (or equivalent) based on the last 60 credit hours of study.

Recipients may hold the Dr. Narain D. Gupta Scholarship in Mathematics concurrently with any other awards, consistent with policies in the Faculty of Graduate Studies.

The selection committee will be named by the Dean of the Faculty of Graduate Studies (or designate).

The Board of Governors of the University of Manitoba has the right to modify the terms of this award if, because of changed conditions, it becomes necessary to do so. Such modification shall conform as closely as possible to the expressed intention of the donor in establishing the award.

Phyllis May-Rolfe Memorial Bursary

Family and friends of Phyllis May-Rolfe (B.N./68), including members of the Nursing Class of 1968, have established an endowment fund of \$6,375 at the University of Manitoba in her memory. The available annual interest from the fund will be used to offer one bursary to an undergraduate student who:

- (1) is enrolled full-time in the Faculty of Nursing;
- (2) has achieved a minimum degree grade point average of 2.5;
- (3) has demonstrated financial need on the standard University of Manitoba bursary application form.

The selection committee shall be the Promotions and Awards Committee of the Faculty of Nursing.

Walker Wood Foundation Bursary

The Walker Wood Foundation offers bursaries for students enrolled in the Physician Assistant Education Program (PAEP) at the University of Manitoba. The PAEP is the first graduate-level program for Physician Education established at a Canadian University. The donor has agreed to fund the bursary for a term of two years, beginning in the 2008-2009 academic session, with the right to

renew the commitment at the end of the term. Each year, three bursaries valued at \$3,000 each, will be offered to graduate students who:

- (1) are Canadian Citizens who have graduated from a high school in Manitoba;
- (2) are enrolled full-time in the Faculty of Graduate Studies in the Physician Assistant Education Program;
- (3) have achieved a minimum degree grade point average of 3.0 based on the last 60 credit hours of study and are in good academic standing;
- (4) demonstrate financial need on the standard University of Manitoba bursary application form.

The Walker Wood Foundation Bursary is renewable but previous recipients must submit the standard University of Manitoba bursary application each year to be considered.

The selection committee will be named by the Dean of the Faculty of Medicine (or designate) and will include the Program Director of the Physician Assistant Education Program (or designate).

The Board of Governors of the University of Manitoba has the right to modify the terms of this award if, because of changed conditions, it becomes necessary to do so. Such modification shall conform as closely as possible to the expressed intention of the donor in establishing the award.

World W.I.S.E. Prize for Student Leadership and Global Citizenship

The International Centre for Students (ICS), through its World W.I.S.E. Resource Centre, offers an annual prize to encourage students at the University of Manitoba to participate in activities that celebrate diversity, curiosity, respect, mutual understanding, and will expand their horizons and develop global skill sets. Each year, the Centre will offer two prizes of \$200 each and a commemorative certificate. One prize will be allocated to a domestic student and one to an international student, who:

- (1) is enrolled full-time in any Faculty or School at the University of Manitoba;
- (2) (i) as an undergraduate student in the Undergraduate Medical Education Program, is in good academic standing or, as an undergraduate student in any other program, has achieved a minimum degree grade point average of 2.5; or
(ii) as a graduate student, has achieved a minimum degree grade point average of 3.0 based on the last 60 credit hours of study;
- (3) has demonstrated exceptional vision and leadership, and who has best demonstrated good global citizenship through (i) his or her participation in activities that bridge local and global communities and (ii) by actions that demonstrate how students are making vital contributions to civil society and are responding constructively to the emerging issues experienced by local and global communities.

Nominations from University of Manitoba students, faculty, or full-time staff, will be submitted to the Director of the International Centre for Students (or designate).

The selection committee will be named by, and will include, the Director of the International Centre for Students (or designate) as chair, one domestic and one international student, one faculty member and one support staff member.

2. Amendments

Leslie F. Buggy Graduate Scholarship in Pharmacy

At the request of the Faculty of Pharmacy, the following statement has been added: “The Faculty of Pharmacy will offer a commemorative medallion, which will be presented to the recipient at the annual Faculty of Pharmacy Graduate Ceremony.”

Caroline A. Cope Award for Excellence in Oncology Research

The following amendments to the terms of reference for the Caroline A. Cope Award for Excellence in Oncology Research have been made at the request of the Faculty of Medicine.

- The number of scholarships has been increased from: one to: two. The annual income from the fund will be divided equally between the two recipients.
- One of the two scholarships will be offered to a graduate student in Medicine and the second will be offered to a student registered in the Postgraduate Medical Education (PGME) program (postgraduate resident or fellow).
- The minimum cumulative grade point average has been removed, as this grading system is not used to assess PGME students.
- A requirement that candidates for the Award have submitted for publication the best peer reviewed research paper in the area of Oncology, in the academic session for which the award is tenable, has been removed. Rather, the selection committee will assess candidates on the basis of an application that will include: (i) a description of their proposed or ongoing research in the area of Oncology, (ii) a curriculum vitae, and (iii) two academic letters of reference from professors at a post-secondary institution.
- A statement has been added to specify that graduate student recipients may hold the Caroline A. Cope Award for Excellence in Oncology Research concurrently with any other awards consistent with policies in the Faculty of Graduate Studies. Postgraduate residents or fellows may hold it with any other award.

Marguerite Hulme Scholarship in Pharmacy

At the request of the Faculty of Pharmacy, the following statement has been added: “The Faculty of Pharmacy will offer a commemorative medallion, which will be presented to the recipient at the annual Faculty of Pharmacy Student Recognition event.”

Simplot Canada Limited Bursary

At the request of the donor, the name of this award has been changed from: *Simplot Canada Limited Bursary* to: *Koch Fertilizer Canada, Ltd. Bursary*.

Jean M. Pearen Scholarship

The terms of reference for the Jean M. Pearen Scholarship, which is offered to students in the Master of Interior Design program, have been amended at the request of the Faculty of Architecture. Candidates will now be evaluated based on their degree grade point average in the last 60 credit hours

of full time study in the Bachelor of Environmental Design (Interior Design Option) program. In the past, candidates were assessed on the basis of their sessional grade point average in the final year of the Bachelor of Interior Design (B.I.D.) program. The change is necessary as the B.I.D. program is no longer offered.

Sociology Graduate Student Entrance Scholarship

At the request of the Department of Sociology, the terms of reference for the Sociology Graduate Student Entrance Scholarship have been amended as follows:

- The pool of candidates will be restricted to those students who have applied by the January deadline for admission and subsequently enroll in the first year of study in the Master's or Doctoral program in the Department of Sociology.
- An amendment has been made to clarify that the award is open to students who have completed an undergraduate degree at another university.
- The revised terms specify that candidates' degree grade point average will be calculated based on the last two years of full-time study.
- Several editorial changes have been made.

Teknion/Global (IDCF) Fellowship

At the request of the Faculty of Architecture, the following amendments have been made to the terms of reference for the Teknion/Global (IDCF) Fellowship:

- In criterion (1), a reference to the Foundation for Interior Design Education Research (FIDER) has been updated to the Council of Interior Design Accreditation (CIDA).
- Criterion (3) has been revised to clarify that candidates will be evaluated on the basis of their degree grade point average.
- A fourth criterion has been added to require that the fellowship recipient has demonstrated potential for innovative research in Interior Design.
- Membership of the selection committee has been revised to also include the Head of the Department of Interior Design (or designate). The stipulations that the faculty representative has at least two years experience on staff and a minimum of five years of experience in the practice of the interior design profession have been removed.
- Several editorial amendments have been made.

University Gold Medal in Engineering and Program Medals

At the request of the Faculty, the *Faculty of Engineering Medal in Geological Engineering* has been withdrawn, as the program is no longer offered.

The selection criteria for the *University Gold Medal in Engineering* and the *Faculty of Engineering Program Medals* have been revised as follows:

- The Gold Medal will now be offered to the graduating student who has achieved the highest degree grade point average (minimum 3.8) for the entire program with no distinction as to full- or part-time status. Similarly, the Program Medals will be offered to the graduating student in each engineering program who has achieved the highest degree grade point average (minimum

3.8) with no distinction as to full- or part-time status. Previously, a candidate's grade point average was calculated using courses completed in the four consecutive academic terms closest to graduation in which the student had completed, on average, at least 90 percent of what is considered to be the full course load in the program. The grade point average was based upon the 90 percent course load in which the best grades were achieved.

- A statement has been added to clarify that Gold Medal and the Program Medals will be awarded at spring Convocation to a student who has completed that program in the past academic year (including October and February graduands).
- The following mechanism will be used to break a tie: (1) the degree grade point average is to be calculated to the fourth decimal place, (2) preference is to be given to the student who has a higher proportion of "A+"s and "A"s in a total program; (3) preference is to be given to students who have taken the largest number of credit hours. Formerly, the person with the largest number of courses, with a grade point average of 3.80 or better, in the four consecutive terms, was awarded the medal. If the tie persisted, the same criteria were applied using six consecutive terms.

3. Withdrawals

Dale Iwanoczko Memorial Volleyball Alumni Scholarship

The terms of reference for the Dale Iwanoczko Memorial Volleyball Alumni Scholarship were withdrawn from the University's awards program, as the trust fund that supported this award has been exhausted.

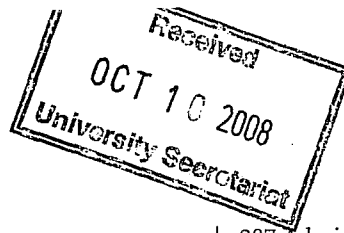
Waterpik Technologies Canada Prize in Dentistry

At the request of the donor, the terms of reference for the Waterpik Technologies Canada Prize in Dentistry have been withdrawn.



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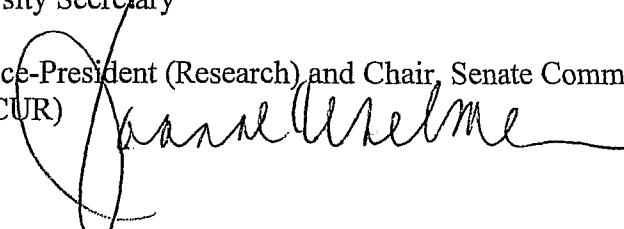
OFFICE OF THE
VICE-PRESIDENT (RESEARCH)



207 Administration Building
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Canada R3T 2N2
Telephone (204) 474-6915
Fax (204) 474-7568
www.umanitoba.ca/vpresearch

MEMORANDUM

TO: Mr. Jeff Leclerc, University Secretary

FROM: Joanne C. Keselman, Vice-President (Research) and Chair, Senate Committee on University Research (SCUR) 

DATE: October 10, 2008

SUBJECT: Notification to Senate on establishment of the University of Manitoba Military & Veteran Health Sciences Research Group

COPIES: Dr. D. Jayas, Associate Vice-President (Research)
Dr. P. Cattini, Associate Vice President (Research)
Dr. Jennifer Laforce, Assistant Professor, Clinical Health Psychology
Dr. Patrick Choy, Associate Dean of Medicine (Research), Faculty of Medicine
Dr. Dean Sandham, Dean of Medicine

The Research Centres, Institutes, and Groups Policy, section 3.4, Procedures for Establishing Research Groups, states that "the official recognition and designation of a research group is at the approval of the Vice-President (Research), normally on the recommendation of the department head (where applicable) and dean/director."

Accordingly, the Dean of Medicine has forwarded a recommendation for the establishment of the University of Manitoba Military & Veteran Health Sciences Research Group to me as Vice-President (Research). I subsequently reviewed and approved the proposal.

As Chair of SCUR, I am now requesting that Senate be informed of the establishment of the University of Manitoba Military & Veteran Health Sciences Research Group.

Please contact me should you require further information. A copy of the proposal for the research group is attached for your information.

JCK/nis

Attach.



UNIVERSITY
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Faculty of Medicine

Office of the Dean
Room 260 Brodie
727 McDermot Avenue
Winnipeg, Manitoba
Canada R3E 3P5
Telephone (204) 789-3557
Fax (204) 789-3928

April 30, 2008

Dr. Joanne Keselman, VP, Research
207 Administration Building
Fort Garry Campus

Re: Proposal for the Establishment of "The University of Manitoba Military & Veteran Health Sciences Research Group"

Dear Dr. Keselman:

I am writing in support of the creation of this research group. Increased enlistment and larger numbers of active duty deployment in war zones are increasing the number of military personnel with the need for the post operational debrief and the need for better information on how to care for their disorders. The presence of 2 large military bases in Winnipeg and the nucleus of established clinical expertise would make the creation of this group pertinent, serviceable and successful.

For these reasons I support this emerging endeavor.

Yours truly,

J. Dean Sandham, MD FRCPC FACP
Dean

Cc: Dr. Patrick Choy

JDS/md



UNIVERSITY
OF MANITOBA

Faculty of Medicine

April 23, 2008

Office of the Assoc. Dean (Research)
753 McDermot Avenue
Winnipeg, Manitoba
Canada R3E 0W3
Telephone (204) 789-3375
Fax (204) 789-3942

To: Dr. J. Dean Sandham
Dean, Faculty of Medicine

From: Dr. Patrick Choy
Associate Dean (Research)

Cc: Dr. Joanne Keselman ✓
Vice-President (Research)

Re: Request for the formation of the University of Manitoba Military and Veteran Health
Sciences Research Group by Dr. Jennifer Laforce

I met with Dr. Jennifer Laforce (Assistant Professor, Clinical Health Psychology), Michael Kaan (Manager, Operational Stress Injury Clinic & Research Program, Deer Lodge Centre), and Dr. David Pedlar (Research Directorate, Veteran Affairs Canada) this afternoon. They provided me with a synopsis of the Research Group, its objective and its current membership. They are requesting the recognition of the Research Group with the ultimate view of turning it into an Institute or Centre in the next several years. A package from Dr. Laforce is enclosed for your records.

Dr. Laforce informed me that the Research Group has the support of Dr. Mike Moffatt, Dr. Robert McIlwraith and Dr. Murray Enns. They also plan to interact with Dr. Jitinder Sareen. They have secured the funding for a research assistant from Veteran Affairs. In view that they have satisfied the requirements for a research group in accordance with University of Manitoba Policy 1405, I feel that the request should be supported by the Faculty.

I am enclosing your letter of support for this research group (copy attached) to Dr. Joanne Keselman.



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DEER LODGE CENTRE

Making lives better

March 14, 2008

Dr. J. Dean Sandham
Dean, Faculty of Medicine
University of Manitoba
727 McDermot Avenue
Winnipeg, MB R3E 3P5

Re: Proposal to Establish a Research Group

Dear Dr. Sandham,

I am pleased to provide you with the attached proposal to establish a new research group at the University, with a focus on the health care of current members of the Canadian Forces, its veterans, and their families. The proposed Group is a unique partnership between interested faculty members and the Operational Stress Injury Clinic, a Veterans Affairs Canada-funded mental health program. The Winnipeg OSI Clinic is one of several operated across the country by VAC—all in partnership with local health authorities—but with federal funding and dedicated research dollars.

Our objective is to take the current research work carried out by faculty members appointed to the clinic, and expand to include other faculty in Medicine, Social Work, Nursing, and other faculties. If we succeed in meeting our initial objectives as a group, we would eventually seek to expand as University Research Institute or Centre.

For operational and historical reasons, the Group will be housed at Deer Lodge Centre, which has a long and continuing history as a facility dedicated to the care of veterans, Canadian Forces members, and their families. Along with the proposal, I am attaching a resource-sharing agreement, outlining the general responsibilities of the various parties in the research group's costs.

I am also attaching letters of support from Dr. Michael Moffatt, WRHA Executive Director of Research and Applied Learning; Mr. Real Cloutier, Chief Operating Officer of Deer Lodge Centre, and Dr. David Pedlar, Director of Research at Veterans Affairs Canada. Dr Pedlar has also indicated that he would be interested in attending any meetings with the University pertaining to the proposal, in order to discuss and clarify the current and future funding possibilities with the federal government.

I look forward to your reply on this, and will be glad to answer any questions about this innovative project.

Yours truly,



Jennifer Laforce, Ph.D., C.Psych
Asst Professor, Clinical Health Psychology
University of Manitoba
Research Coordinator, OSI Clinic
Deer Lodge Centre
2109 Portage Avenue
Winnipeg, MB R3J 0P3

Cc: Real Cloutier, Deer Lodge COO and Vice-President, WRHA
Dr. Michael Moffatt, Executive Director,
WRHA Dept of Research and Applied Learning
Dr. David Pedlar, Director of Research, Veterans Affairs Canada
Dr. Norman Shields, Director of Research, National Centre for OSI
Dr. Maryse Savoie, Director of Research, St. Anne's Hospital

Proposal for the Establishment of a Research Group

Name

"The University of Manitoba Military and Veteran Health Sciences Research Group"

Objectives

The objectives of the group are:

1. To serve as a focal organization for academics with ongoing research interests in the health of military forces members, veterans, and their families, particularly in regards to psychological health, family and social well-being, neuropsychological impairment, rehabilitation, and health psychology.
2. To organize research-related events to promote the group's work.
3. To attract graduate students, either future researchers or clinicians, to the field of military health care and health research.

Rationale

There is currently a substantial gap in Canada between the demand for science-based knowledge on the health of military and veteran populations—from the press, the public, government, and scholars in many fields—and the production and pace of such research within our borders. This gap is problematic both for actively serving military personnel and veterans of the military. Currently, the United States is the most common source for new findings in this area, followed by the United Kingdom, but differences of scale, policy, health systems, military demographics, and deployments make many of these findings of limited value to Canada. Although there has been increasing interest in this area over the past decade, research and funding structures have yet to lay the groundwork for a sustainable and well-defined nationwide research program that can be relied upon by Canadian healthcare practitioners, policy makers, and military leaders.

However, public and political interest in the topic have now reached the point where there is support within the civil sector to begin establishing such a program. Organizations and scholars who seize the opportunity to be at the forefront of this process will find themselves not only expanding research capacity within the field but, more importantly, laying the cornerstones of a nation-wide network that can provide independent and rigorous findings in an important and long-neglected subject. Universities with established capacity in both the health sciences and security and defense issues are ideally suited to this task.

There are several nationwide factors that make the establishment of this group timely:

First, Veterans Affairs Canada (VAC) has poured new resources into health care and health research for newer veterans, since existing research on primarily geriatric issues does not apply to those who have served in combat operations from the Balkans (mid-1990s) to the present. As part of this new effort, VAC now funds an Operational Stress Injury Clinic (OSIC) through the WRHA.

This clinic is one of several such clinics across the country. Along with the head clinic in Montreal (within the National Centre for Operational Stress Injuries), clinics in Calgary, Quebec City, Fredericton, and London, and future clinics in Ottawa, Vancouver, and Edmonton, this VAC-funded network has a research mandate, both at the level of individual clinics, and at the integrated national level. All clinics have, in varying degrees, some form of affiliation with local universities, and in many clinics the staff includes university-appointed faculty. The clinic at Deer Lodge Centre currently includes three University of Manitoba-appointed staff, and is likely to receive funding for two more. Although VAC does not yet have a direct funding mechanism for supporting research, it does fund the clinic's research indirectly by providing salaries and operating expenses for research.

Second, military recruitment has increased dramatically in recent years, but so has the rate of early releases (due to the stress of recent military operations). The overall increase in the size of both the current and recently released populations creates additional health issues for study, as well as larger populations available for research.

The proposed group would have potential synergies with other groups and institutes, without infringing on or duplicating their activities. These include the Centre for Defence and Security Studies, the Sport and Human Performance Research Group (due the human factors component of military health research), the Centre on Aging, and the Mood and Anxiety Disorders Research Group. This last group is primarily concerned with mood disorders in general and the more common anxiety disorders, whereas the Military and Veteran Health Sciences Group would have a more specific focus on Post-Traumatic Stress Disorder, and only in the military context.

Further information about the OSI Clinic itself is available at:

<http://www.deerlodge.mb.ca/osi/index.asp>

Description and Constitution

Organization

The Group would be based out of the Operational Stress Injury Clinic at Deer Lodge Centre, as the initial members are all based there, in addition to the clinic's Research Assistant (a permanent position funded by VAC). The clinic's Research Coordinator, Dr. Jennifer Laforce (Asst Prof., Clinical Health Psychology), would serve as its Director. The Group would therefore operate out of the Faculty of Medicine. We would also seek to do interdisciplinary research, and welcome members from other disciplines and faculties such as Nursing, Social Work, Family Studies, and other fields.

Membership

Membership would be open to University Faculty with an established program of research relating to the health of military members, veterans, or their families. Members would be required to meet regularly to discuss research activities, review new literature on relevant topics, and discuss funding opportunities. On a limited basis, organizations with similar research may also have administrative representation at the Group, such as research administrators from National Defence, Veterans Affairs, or the Winnipeg

Regional Health Authority. The role of administrative representatives is to coordinate the Group's research activities with emerging policy and funding opportunities in National Defence, Veterans Affairs, and the Winnipeg Regional Health Authority.

Reporting Procedures

Members will report to their specific department heads as per their existing contracts. The group's director will also update the OSI Clinic Manager on new projects, and on any issues that may relate to patient care.

Review and assessment Mechanisms

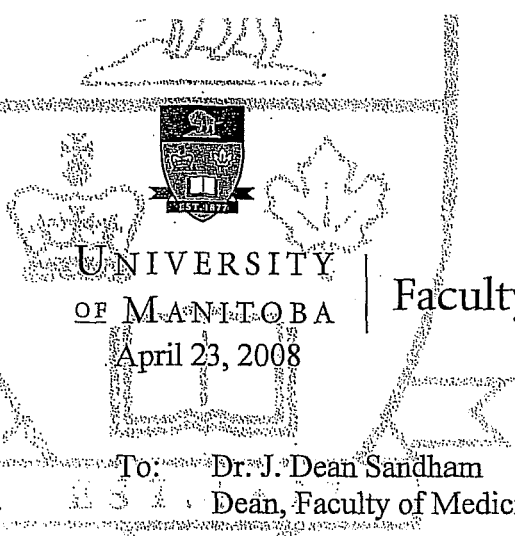
The group will define a general research program for itself and establish pertinent projects within the program, specifically in the areas identified in Objective 1. The group will conduct semi-annual summaries of research activities, publications, presentations, grant applications and awards, and resource acquisitions (e.g., a library). The group's director will prepare an annual report for the Vice-President (Research)

Members and Abbreviated CVs

Jennifer Laforce, Ph.D., C.Psych., Director
Joseph Polimeni, MD, FRCP(C)
Nancy Prober, Psy.D., C.Psych.

Statement on resource and cost responsibilities

See attached document.



UNIVERSITY
OF MANITOBA

April 23, 2008

Faculty of Medicine

Office of the Assoc. Dean (Research)
753 McDermot Avenue
Winnipeg, Manitoba
Canada R3E 0W3
Telephone (204) 789-3375
Fax (204) 789-3942

APR 23 2008

To: Dr. J. Dean Sandham
Dean, Faculty of Medicine

From: Dr. Patrick Choy
Associate Dean (Research)

Cc: Dr. Joanne Keselman
Vice-President (Research)

Re: Request for the formation of the University of Manitoba Military and Veteran Health
Sciences Research Group by Dr. Jennifer Laforce

I met with Dr. Jennifer Laforce (Assistant Professor, Clinical Health Psychology), Michael Kaan (Manager, Operational Stress Injury Clinic & Research Program, Deer Lodge Centre), and Dr. David Pedlar (Research Directorate, Veteran Affairs Canada) this afternoon. They provided me with a synopsis of the Research Group, its objective and its current membership. They are requesting the recognition of the Research Group with the ultimate view of turning it into an Institute or Centre in the next several years. A package from Dr. Laforce is enclosed for your records.

Dr. Laforce informed me that the Research Group has the support of Dr. Mike Moffatt, Dr. Robert McIlwraith and Dr. Murray Enns. They also plan to interact with Dr. Jitinder Sareen. They have secured the funding for a research assistant from Veteran Affairs. In view that they have satisfied the requirements for a research group in accordance with University of Manitoba Policy 1405, I feel that the request should be supported by the Faculty.

I am enclosing your letter of support for this research group (copy attached) to Dr. Joanne Keselman.

Dr. P. Choy
Associate Dean (Research)

Dr. G. Pierce
Assistant Dean (Research)

Dr. E. Kroeger
Assistant Dean (Graduate Studies)

Mrs. T. Turner
Administrative Assistant

Veterans Affairs
CanadaAnciens Combattants
Canada

March 12, 2008

Dr. Johanne Keselman
Vice President of Research
University of Manitoba
Winnipeg, Manitoba
R3T 2N2

SUBJECT: Letter of Reference in Support of Military and Veteran Health Research Group

Dear Dr. Keselman:

Please consider this letter in support of the Deer Lodge proposal to establish a Military and Veteran Health Research Group in partnership with the University of Manitoba.

I strongly encourage efforts to help strengthen Canada's capacity to conduct research studies to better understand Veteran health issues as well as models of service delivery and treatment approaches to address Veteran health needs. The Deer Lodge proposal has great potential as a partnership between the Deer Lodge Operational Stress Injury Clinic and the University of Manitoba, with close linkages to Veterans Affairs Canada. Veterans Affairs Canada is currently strengthening its research capacity across a network of Veteran Mental Health clinics in Canada and we strongly encourage university-clinic partnerships.

I look forward to further contact with you to discuss our support and interest in this proposal. I understand that Deer Lodge is scheduling a meeting.

Sincerely yours,

David Pedlar, Ph.D
Research Directorate

Canada



Winnipeg Regional
Health Authority

Caring for Health

Office régional de la
santé de Winnipeg

À l'écoute de notre santé

1800 - 155 Carlton St.
Winnipeg, Manitoba
R3C 4Y1 CANADA

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FAX: 204 / 926.7007
www.wrha.mb.ca

155, rue Carlton, suite 1800
Winnipeg, Manitoba
R3C 4Y1 CANADA

TÉL.: 204 / 926.7000
TÉLÉC: 204 / 926.7007
www.wrha.mb.ca

March 17, 2008

Dr. Joanne Keselman
Vice-President (Research)
University of Manitoba
207 Administration Building
Winnipeg, Manitoba
R3T 2N2

Dear Dr. Keselman:

Re: Letter of Support to Establish a Military Health Sciences Research Group

I am writing a letter of support for the concept of developing a Military Health Sciences Research Group as a partnership between several parties including the WRHA, the University of Manitoba and Veterans Affairs Canada.

The issue of studying and understanding operational stress issues and how to prevent or treat them is, of course, highly relevant as Canada seems likely to remain involved in conflict situations in the world for the foreseeable future. A strong clinical and research presence is developing at the Deer Lodge Centre, and a natural evolution of this process is to partner with others who can extend the scope and the relevance of the research performed here.

Although many details remain to be worked out, the WRHA is highly supportive of this endeavour.

Yours Sincerely,

Dr. Michael Moffatt, M.D., MSc., FRCPC
Executive Director
Research and Applied Learning
Winnipeg Regional Health Authority

CC: Dr. Brian Postl, President and Chief Executive Officer, Winnipeg Regional Health Authority



DEER LODGE CENTRE

Making lives better

2109 Portage Avenue
Winnipeg, Manitoba R3J 0L3
www.deerlodge.mb.ca

March 25, 2008

Dr. Joanne Keselman
Vice-President (Research)
University of Manitoba
Winnipeg, MB
R3T 2N2

Subject: Proposal for the Establishment of a Military Health Sciences Research Group

I am writing in support of creating the above noted research group for the Winnipeg Health Region under the auspices of the University of Manitoba.

Services for military personnel care and veterans are expanding given the current conflict in Afghanistan and given the recent commitment made by the Canadian Government to extend the NATO mission, service demands will likely increase. It is important that services for the military and veterans have a strong research connection. Deer Lodge Centre as an operating division of the Winnipeg Health Region has a long tradition in caring for Veterans and its obvious that this role is evolving. We also know that many members of the military are treated for health conditions in other parts of our health care system.

I think expanding our research emphasis in this area to meet current and emerging needs would be beneficial.

I hope that the University of Manitoba will support our request.

Sincerely,

Réal J. Cloutier
Chief Operating Officer

RJC/lld

copy: Michael Kaan
Michael Moffat
Dr. Brian Postl
Jo-Ann Lapointe-McKenzie

An operating division of the Winnipeg Regional Health Authority

Statement on resource sharing and financial responsibilities

Professional time

The Dean agrees to allow faculty members of the Military and Veteran Health Sciences Research Group to undertake research and research promotion for that group, within the allocation described in each faculty member's contract.

Deer Lodge Centre also agrees that the Operational Stress Injury Clinic's Research Assistant may, at the Group Director's discretion, be permitted to provide support to the group's research activities.

Space

The Group will be housed at Deer Lodge Centre, and may make use of the OSI Clinic's space for research purposes, provided it does not impede clinical services.

Financial resources

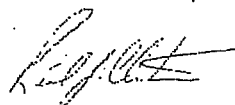
Deer Lodge Centre agrees that the group may ask the OSI Clinic to supply the following materials for its research, so long as they are also congruent with the specific research requirements of the OSI Clinic, and recognizing that the final decision on such purchases rests with the Clinic's manager:

- Library texts
- Psychometric instruments for research
- Participant honoraria
- Printing costs
- Small equipment as needed

For the following items, the OSI Clinic cannot provide financial support to those members of the Group who are not also staff at the Clinic:

- Travel and education costs
- Membership and subscription fees
- Other items not in the above list

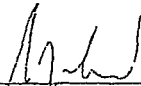
In addition to direction provided by University and WRHA policies on health research, all other resource sharing and related expenses are at the joint discretion of Deer Lodge Centre and any University departments or faculties with representation at the Group.



Réal J. Cloutier, COO, DLC

June 10, 2008

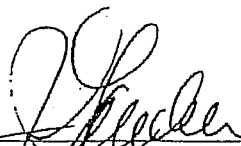
[Date]



Dr. M. Enns, Head, Psychiatry

July 2, 2008

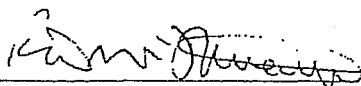
[Date]



Dr. J. Sandham, Dean of Medicine

July 7, 2008

[Date]



Dr. R. McIlwraith, Head, Clinical Health Psychology

July 7, 2008

[Date]



UNIVERSITY
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Dean Sandham
260 Brodie 727 McDermot Ave.
Faculty of Medicine
University of Manitoba

October 10, 2008

Dear Dean Sandham:

I have had an opportunity to review the establishment proposal for the University of Manitoba Military & Veteran Health Sciences Research Group, which notes your support as well as that of Dr. Jennifer Laforce (Clinical Health Psychology), Dr. David Pedlar (Research Directorate, Veteran Affairs Canada), Dr. Michael Moffatt (WRHA Executive Director of Research and Applied Learning, and Mr. Real Cloutier (Chief Operating Officer of Deer Lodge Centre). I am pleased to advise that it meets with my approval. Accordingly, I will notify the Senate Committee on University Research of my approval of this research group, and, in turn, will inform the Senate of the University.

By copy of this letter, I am extending my congratulations to Dr. Jennifer Laforce and members of the research group. I look forward to learning of the research activities and achievements of the University of Manitoba Military & Veteran Health Sciences Research Group.

Sincerely,

Joanne C. Keselman, Ph.D., Vice-President (Research)

JCK/nis

c.c. Dr. Jennifer Laforce, Assistant Professor, Clinical Health Psychology
Dr. Patrick Choy, Associate Dean of Medicine (Research), Faculty of Medicine



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Sincerely,

Joanne C. Keselman, Ph.D., Vice-President (Research)

JCK/nis

c.c. Dr. Jennifer Laforce, Assistant Professor, Clinical Health Psychology
Dr. Patrick Choy, Associate Dean of Medicine (Research), Faculty of Medicine

November 19, 2008

Report of the Senate Executive Committee

Preamble

The Executive Committee of Senate held its regular monthly meeting on the above date.

Observations

1. Speaker for the Executive Committee of Senate

Dean Sandham will be the Speaker for the Executive Committee for the December meeting of Senate.

2. Comments of the Executive Committee of Senate

Other comments of the Executive Committee accompany the report on which they are made.

Respectfully submitted,

Dr. David Barnard, Chair
Senate Executive Committee
Terms of Reference:

http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/477.htm

/mb

Report of the Senate Committee on Course and Curriculum Changes – Process for Deletion of Lapsed Courses and Elimination of “Not Currently Offered” Category

Preamble

1. The terms of reference for the Senate Committee on Curriculum and Course Changes (SCCCC) are found on the website at:
http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/497.htm. SCCCC is “to recommend to Senate on the introduction, modification or abolition of undergraduate programs, curricula or courses”.
2. At its meeting on April 9, 2008, the Senate Committee on Curriculum and Course Changes discussed the viability of the use of a “Not Currently Offered” category of course changes and the handling of courses not offered in the past five years (lapsed courses).

Observations

1. In the past, the Senate Committee on Curriculum and Course Changes has considered proposals from faculties/schools to put courses into a category of “Not Currently Offered”. The Committee discussed the rationale behind this category.
2. The Committee noted that the designation of courses in this manner could be misleading to students who, when planning their program, may expect a course to be offered at some point within their degree when, in actual fact, this is not really a possibility.
3. It was further noted that the process to “reactivate” a course which had been moved into the “Not Currently Offered” category is exactly the same as that required to “Introduce” a course.
4. The Committee could see no benefit to having courses appear in the Calendar which will not be available to students. This does not include those courses which are offered in alternate years but rather to courses which have not been offered in the last five years.
5. The Committee noted that the change will allow the Libraries to focus its resources on supporting courses currently being offered.

Recommendations

The Senate Committee on Curriculum and Course Changes recommends, effective January 2009:

1. THAT the use of the category of “Not Currently Offered” be terminated.
2. THAT the following process be followed to deal with those courses which are not currently available:
 - i) In June each year, the Registrar’s Office shall prepare a list of courses, by faculty/school that have not been offered in the previous five academic years (July 1 – June 30).

Comments of the Senate Executive Committee:
The Senate Executive Committee endorses the report to Senate.

- ii) The University Secretary will forward the list to each Dean and Director, advising that, if the faculty/school does not respond by September 30th, all courses on the list will be automatically deleted and removed from the Calendar, and subsequently reported to Senate for information.
- iii) If a faculty/school wishes to retain a course from the list, a written request, with rationale for the retention of the course, must be submitted to the University Secretary prior to September 30th. Such requests shall be forwarded to the Senate Committee on Curriculum and Course Changes for undergraduate courses or the Programs and Planning Committee of the Faculty of Graduate Studies for graduate courses for consideration and recommendation to Senate.

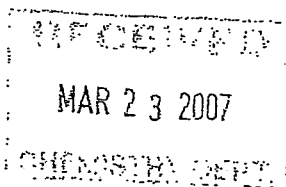
Respectfully submitted,
Professor H. Frankel, Acting-Chair
Senate Committee on Curriculum and Course Changes

/mb



UNIVERSITY
OF MANITOBA

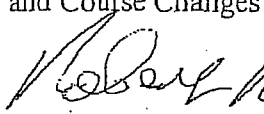
Office of the
Vice-President (Academic) & Provost



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March 19, 2007

TO: ☒ Dr. Norman Hunter, Chair, Senate Planning and Priorities Committee
Dr. James Welsh, Chair, Senate Committee on Curriculum and Course Changes

FROM: Robert Kerr, Vice-President (Academic) & Provost 

SUBJECT: Institutional Expectations for Undergraduate Programs

Attached is a proposal to establish a set of Institutional Expectations for our Undergraduate programs at the University of Manitoba. The proposal itself was developed through discussions at the Deans and Directors Council; a group advisory to the President.

The proposal arises both from the current concern around quality assurance in Higher Education, and our own Institutional commitment to re-think our Undergraduate curriculum (Building for a Bright Future, 2003). In identifying these Institutional Expectations it is anticipated that many, if not all, are already present in our degree programs. However, given the consistent turnover of faculty and staff it is appropriate to reconsider the Institution's educational goals from time-to-time. This reconsideration is also useful as it provides the opportunity to respond to, or reflect upon, the changing needs of the community we serve.

Given the current emphasis on quality assurance in Higher Education, it is important that the Institutional commitment to quality educational programs be definitive, transparent, and easily accessible to the public at-large. Hence, it is in this context that the proposal to describe an Institutional commitment with regard to expectations was developed. These Institutional Expectations would, in turn, frame the context within which our undergraduate programs would be offered.

As to the attached document, whereas there is an extensive literature around educational expectations and the educated person, the document presents a straightforward statement of Institutional Expectations. For the purpose of comparison, a similar statement from the University of Windsor is attached. In order to provide some background a brief commentary for each of the items, with some references, has also been attached. Nevertheless, the intent is to propose the adoption of this statement of Institutional Expectations by the Senate.

On behalf of the Deans and Directors Council, I offer this proposal for your consideration and remain available to respond to questions as they may arise.

The Ideal Graduate

Institutional Expectations at the Undergraduate level for the University of Manitoba

The June 2003 strategic academic plan Building for a Bright Future set out as one of the challenges for the University of Manitoba "to create a learning environment that will provide individuals with a reason to choose the University of Manitoba as their place of career and locus of intellectual life." In Building for a Bright Future we also made a commitment "to re-think the undergraduate curriculum." The challenge now is to provide the learning environment that will allow us to fulfill that commitment. What this requires of the University of Manitoba is that we should define the overall learning outcomes we expect to be associated with any student who graduates from the University of Manitoba. The question we ask here is, beyond the specialized knowledge and skills associated with a particular degree program, what are our expectations of a University of Manitoba graduate?

In establishing these expectations we acknowledge that how they are achieved or delivered will vary by program as will how we assess that they have been achieved or delivered. It is also acknowledged that most of the existing programs may meet a majority of these expectations. It is intended that eventually all degree programs meet these expectations and will demonstrate their success. However, it is evident that some of these expectations are not limited to academic programs. It remains, therefore, the responsibility of the institution as a whole to provide the opportunities necessary to fulfill these expectations. In doing so we should remind ourselves of the principles to which the University committed in Building on Strengths (1998).

Institutional Principles (see Appendix B)

<excellence> <integrity> <selectivity> <innovation> <equity and diversity>
<responsibility to society> <academic freedom> <accountability>

Statement of Expectations

- A. The specific objective of our undergraduate programs is to provide students the opportunity to obtain specialized knowledge and skills through a given discipline or professional field of study.
- B. Beyond the specialized knowledge and skills that students acquire through their particular degree program, the aim is to provide students the opportunity to obtain:
 - 1. The basic skills necessary for the analysis, synthesis and communication of knowledge.
 - 2. An understanding of the inquiry practices of the humanities, social and natural sciences.
 - 3. A sense of the interrelatedness of knowledge, including inter-cultural knowledge.
 - 4. A sense of responsibility for society, including the principles of respect, civility and the role and obligations of citizenship.
 - 5. A practical experience involving collaboration and problem-solving skills.
 - 6. An opportunity to participate in creative scholarship activity.
 - 7. An aesthetic sensibility through exposure to art, music, drama and literature.
 - 8. A continuing commitment to learning.

APPENDIX A
Expanded Statement of Expectations

1. The basic skills necessary for the analysis, synthesis and communication of knowledge.

Basic skills can be interpreted to mean a large number of different capabilities, however, in this context the focus is on critical thinking. Critical thinking consists of a mental process of analyzing or evaluating information. It forms a process of reflecting upon the meaning of statements, examining the offered evidence and reasoning, and forming judgments about the facts. Critical thinkers can gather such information from observation, experience, reasoning, and/or communication.

2. An understanding of the inquiry practices of the humanities, social and natural sciences.

Inquiry practices include the ability to define problems and access, retrieve, and evaluate information as well as the search for truth, information, knowledge and understanding. Methodologies vary by the field of study, but are based upon systematic study, reflection, intuition and innate creativity. With this comes a depth and breadth of understanding that is characterized by the ability to recognize the implications of the information and to put it into a broader context.

3. A sense of the interrelatedness of knowledge, including inter-cultural knowledge.

An understanding of the world may be associated with a sense of the historical development of the disciplines and that no discipline is self-sufficient or autonomous. This sense of interrelatedness of knowledge can be described in the comprehension of the variety of political, religious, cultural, geographical, biological, environmental, and historical components that contribute to shaping nature and the human condition.

4. A sense of responsibility for society, including the principles of respect, civility and the role and obligations of citizenship.

The ability to recognize our own cultural traditions, understand and appreciate diversity, respect the economic, social and biological interdependence of the world, provide the opportunity to develop an appreciation for the beauty and complexities of citizenship in our community and in the world.

5. A practical experience involving collaboration and problem-solving skills.

The opportunity for students to examine and organize disciplinary ways of knowing and to apply them to specific issues and problems. To allow students, with others or alone, to form strategies that work in different situations, to apply these strategies and evaluate their effectiveness.

6. An opportunity to participate in creative scholarship activity.

A continuing commitment to learning may best be encouraged by the opportunity for personal involvement in learning. This includes research and/or creative projects in which students take the primary responsibility for framing questions, carrying out analyses, and producing a work of increasing complexity and quality. These opportunities develop "habits of the mind that foster integrative thinking and the ability to transfer skills and knowledge from one setting to another" (AACU, 2004).

7. An aesthetic sensibility through exposure to art, music, drama and literature.

An aesthetic sensibility can be developed through engagement with various forms of art and in the artistic process. Aesthetic sensibility may be attained by a sufficient exposure, not necessarily in courses alone, to works of art, music, literature, and drama and to the critical traditions concerning them.

9. A continuing commitment to learning.

Lifelong learning is, simply put, an attitude that one can be open to new ideas, decisions, skills or behaviours. This continued commitment to learning may be demonstrated in terms of intellectual curiosity, the ability to ask useful kinds of questions, and the ability to see implications and make connections.

References

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APPENDIX B
Institutional Principles
from: Building on Strengths (1998)

<excellence> <integrity> <selectivity> <innovation> <equity and diversity>
<responsibility to society> <academic freedom> <accountability>

<Excellence>

Quality in what we do comes first. For this reason we aspire to excellence in undergraduate and graduate teaching, and in research, scholarship and creative work. We expect superior performance of our faculty, staff and students.

<Selectivity>

Our uniqueness in Manitoba lies in our mandate to offer professional and graduate education, to take a leadership role in advancing scholarly understanding and creative expression, and to generate new knowledge. These foci create an enriched learning environment for undergraduate students and an outstanding environment in our areas of academic strength. It is in the latter areas that our graduate and professional programs should be concentrated. We will identify our academic strengths and build on them.

<Equity and Diversity>

We believe in the inherent dignity of all people. All who have the potential to succeed at our University should have access to it. We respect our differences, celebrate our commonalities, and are united in our mutual focus on intellectual achievement. We promote equity in access to our programs and employment and in the conduct of the University's affairs.

<Academic Freedom>

We will protect the right of everyone in our academic community to intellectual independence and critical inquiry. Advancement of understanding in research, scholarship and creative work and the transmission of that knowledge to students requires the privilege of speaking and writing freely. Members of our University have a personal and institutional commitment to academic freedom in the performance of their academic duties.

<Integrity>

We are committed to intellectual honesty, and our actions will continue to be consistent with our beliefs.

<Innovation >

We believe in change to maximize opportunities for learning and to bring about a pedagogic excellence. We appreciate the roles of experimentation and free exploration in fostering discovery. We accept the responsibility to identify ways to transfer knowledge easily and quickly for the betterment of society.

<Responsibility to Society>

By enhancing the opportunities for faculty, student and staff to learn and to work in an enriched environment, by taking care to foster in our students habits of mind and deepening of character, by focusing on outstanding achievements in scholarly inquiry and research by our

professors, and by increasing and elaborating community and professional service, we act in the best interest of the people of Manitoba. Our activities in teaching, research and service will improve the quality of life and assist in the economic, social and cultural development of our province and the world.

<Accountability>

The University of Manitoba is accountable for:

- (a) facilitating access to its programs for as many students as meet its admission requirements and as can be accommodated and effectively educated with the available resources;
- (b) providing programs that meet or exceed appropriate standards for admission, evaluation and graduation of students and for curriculum content and teaching effectiveness;
- (c) facilitating research, scholarship and creative works that are of high quality as judged by international standards;
- (d) exhibiting an exemplary work environment for work and study with particular attention to policies and procedures designed to foster equity; and
- (e) exhibiting responsible management of physical and human resources.

APPENDIX C

Attributes of a University of Windsor Graduate

In addition to whatever specialized knowledge he or she learns in a given field of study, every Windsor graduate will be known for attributes like the following (which have been – adapted by the Programme Development Committee of Senate from a list originally prepared by Dr. Harry Hubbell of the University of British Columbia during his visit to Windsor in February 2003):

The ability to demonstrate:

- the acquisition, application and integration of knowledge
- research skills, including the ability to define problems and access, retrieve and evaluate information (information literacy)
- critical thinking and problem-solving skills
- literacy and numeracy skills
- responsible behaviour to self, others and society
- interpersonal and communications skills
- teamwork, and personal and group leadership skills
- creativity and aesthetic appreciation
- the ability and desire for continuous learning

Report of the Senate Committee on Curriculum and Course Changes RE: Institutional Expectations for Undergraduate Programs

Preamble

1. The terms of reference for the Senate Committee on Curriculum and Course Changes (SCCCC) are found on the website at:
http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/497.htm.
2. At its meeting on April 9, 2008, the Senate Committee on Curriculum and Course Changes discussed a proposal from the Vice-President (Academic) and Provost to establish a set of Institutional Expectations for Undergraduate Programs.

Observations

1. The Committee expressed basic support for the underlying principle of this document.
2. The Committee emphasized that the expectations be guiding in nature and not represent a measurable component that every student is required to demonstrate prior to graduation. It was noted that the undergraduate experience encompasses more than just the academic experience.
3. The Committee questioned the purpose of the document. Is it: For use in program development, to appear on the university home page, to be included in the Undergraduate Calendar as a statement? The Committee agreed that the proposed statement gives focus to the rights and responsibilities of students which are attendant upon entering a community of scholars.
4. The Committee looked favorably on having faculties and programs, including those which currently have guidelines in place, reviewing these expectations in the course of reviewing their undergraduate programs.
5. The document provides useful thoughts to aspire towards in program planning and development, and will provide a useful starting point for those who are developing new programs.
6. The Committee suggested that the division of the *Statement of Expectations* into two categories, A and B, would be better served under one package where both categories would be viewed as equally important.
7. The Committee considered that part A of the *Statement of Expectations* is too focused on a specific discipline of study and should be expanded to include inter-disciplinary study.

Comments of the Senate Executive Committee:
The Senate Executive Committee endorses
the report to Senate.

Recommendation

The Senate Committee on Curriculum and Course Changes recommends:

THAT Senate approve the proposal of the Vice-President (Academic) and Provost regarding Institutional Expectations for Undergraduate Programs [dated March 19, 2007] to be used as a guideline for the objectives of the undergraduate program.

Respectfully submitted,

Professor H. Frankel, Acting Chair
Senate Committee on Curriculum and Course Changes

/mb

Report of the Senate Planning and Priorities Committee RE: Proposal to establish a set of Institutional Expectations for Undergraduate Programs at the University of Manitoba

Preamble:

1. The terms of reference of the Senate Planning and Priorities Committee (SPPC) are found on the website at:
http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/508.htm
2. A joint meeting was held in September 2007 with the Senate Committee on Curriculum and Course Changes where Dr. Kerr, Vice-President (Academic) and Provost presented the document Institutional Expectations for Undergraduate Programs.
3. SPPC discussed the document at subsequent committee meetings.

Observations:

1. Each degree program offered at the University of Manitoba is expected to have a foundation of courses required of each student in the early stages of their education. Building on that foundation will be a required core of courses, delivered by one or more departments, which provide the specialized knowledge and skills expected of the graduate of that degree program. In most degree programs, an additional selection of specialized courses will be available for students to pursue their interests within the degree discipline.
2. Beyond the foundational and core requirements of each degree it is expected that the graduate of a University of Manitoba will have developed skills and knowledge including the following:
 - a. The basic skills necessary for the analysis, synthesis and communication of knowledge.
 - b. An understanding of the inquiry practices of the humanities, social and natural sciences.
 - c. A sense of the interrelatedness of knowledge, including inter-cultural knowledge.
 - d. A sense of responsibility for society, including the principles of respect, civility and the role and obligations of citizenship.
 - e. A practical experience involving collaboration and problem-solving skills.
 - f. An opportunity to participate in creative scholarship activity.
 - g. An aesthetic sensibility through exposure to art, music, drama and literature.
 - h. A continuing commitment to learning.
3. These institutional expectations will normally be met by the degree design rather than by either a selection (cafeteria style) of courses or single course. In some cases, the development of a 'capstone' course at the senior level of the degree will provide the optimal means of addressing many of these expectations.
4. These institutional expectations will be specifically addressed with regard to the introduction of future degree programs, and all degree programs should be reviewed concerning the extent to which they address these expectations.

Comments of the Senate Executive Committee:
The Senate Executive Committee endorses
the report to Senate.

Page 1 of 2

5. The Committee observed that an undergraduate education encompasses experiences both within and outside of the classroom and noted that many of these expectations would be obtained by students outside of the classroom.
6. Even though it is not possible, nor essential, that a formal assessment be made of the extent to which an individual student has reached these expectations, it should be the goal of all programs to provide students the opportunity to excel in their discipline and in the broader educational aspects.

Recommendation:

The Senate Planning and Priorities Committee recommends:

THAT Senate approve the proposal of the Vice-President (Academic) and Provost regarding Institutional Expectations for Undergraduate Programs [dated March 19, 2007] to be used as a guideline for the objectives of the undergraduate program.

Respectfully submitted,

Professor N. Hunter, Chair
Senate Planning and Priorities Committee

THE FORMAL PROGRAM PROPOSAL

Institution Submitting the Formal Program Proposal:

The University of Manitoba

Title of Proposed Program:

Internationally-Educated Engineers Qualification Program (IEEQ)

Faculty/Department in which the Proposed Program will be located:

Faculty of Engineering, Dean's Office

Name of Person(s) responsible for the Program:

Dr. M.G. (Ron) Britton, P.Eng., Associate Dean (Design)

Credential to be Offered:

Post-Baccalaureate Diploma

Date of Program Implementation:

as soon as possible

President's/Rector's Signature

Date

Date Received by Council on Post-Secondary Education: _____

SECTION 1 Program Description

1. Describe the program, including each area of concentration, as it would appear in a catalogue.

The Faculty of Engineering offers the IEEQ Program to serve international engineering graduates (IEGs) pursuing foreign credentials recognition with the Association of Professional Engineers & Geoscientists of Manitoba (APEGM), the regulatory/licensing body for engineering in Manitoba. Through the IEEQ Program, IEGs

- meet requirements for academic qualification with APEGM and, upon successful completion of IEEQ program requirements, are registered with APEGM as a Member-in-Training and;
- earn a Post-baccalaureate Diploma from the University of Manitoba.

Requirements for admission to the IEEQ Program include:

- A completed *Assessment of Academic Credentials* with APEGM, with a result of five or fewer assigned Confirmatory Exams required for academic qualification;
- Permanent Resident or Canadian Citizen status; and,
- English language proficiency to benchmark level 8 on the Canadian Language Benchmarks.

Program entrance is in September of each year. Classes take place on the University of Manitoba campus during daytime hours, Monday through Friday, and co-op work terms take place in local industry. The expected time for full-time students to complete the program is 12 months.

The IEEQ Program can accept applicants whose Confirmatory Exam assignments correspond to one of the six (6) accredited undergraduate engineering programs offered in the Faculty of Engineering. These programs are: Biosystems Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Manufacturing Engineering, and Mechanical Engineering.

Further information on the program is available through the Faculty of Engineering's webpage: <http://umanitoba.ca/engineering/ieeq>

The post-baccalaureate diploma consists of a minimum of 24 credit hours of coursework. The exact number of credit hours required to be completed in the post-baccalaureate diploma will be determined by the IEEQ Director and will vary according to the number of Confirmatory Exams assigned by APEGM. The requirements for completion in the IEEQ Program vary from a minimum of four courses (10 credit hours) to a maximum of nine (9) courses (31 credit hours). Transfer credit provisions may be used to meet the minimum of 24 credit hours required.

Internal note:

Minimum program in IEEQ:

Engineering Economics CIVL 4050 – 3 cr.hr.
Practicing Prof Eng in Manitoba ENG 4010 – 3 cr.hr
Co-op work term ENG 4012 – 1 cr.hr
One technical course – 3 cr.hr. (min)
Total minimum program: 4 courses or 10 cr.hrs.

Maximum program in IEEQ:

Engineering Economics CIVL 4050 – 3 cr.hr.
Practicing Prof Eng in Manitoba ENG 4010 – 3 cr.hr
Co-op work term ENG 4012 – 1 cr.hr
Six technical courses – 4 cr.hr (max) x 6 = 24 cr.hr.
Total maximum program: 9 courses or 31 cr.hrs.

2. Where possible, list the courses (title, number, semester credit hours, and catalogue description) that would constitute the requirements and other components of the proposed program. Indicate which courses are currently offered and which will be new.

The required course work for the post-baccalaureate diploma consists of

- New course: ENG 4010 *Practicing Professional Engineering in Manitoba* Cr.Hrs.3. An introduction to the practice of professional engineering in Manitoba, including culture, professional organization and regulation, employability aspects, engineering ethics and law. Pre-requisite: enrolled in the IEEQ Program.
- New course: ENG 4012 *IEEQ Cooperative Education Assignment* Cr.Hrs.1. Professional work assignment in business, industry, or government for cooperative education students in the IEEQ Program. Requires submission of a written report covering the work completed during the minimum 16-week work period. (Pass/Fail grade only). Prerequisite: enrolled in IEEQ Program with 80% of courses complete, including ENG 4010; good academic standing.
- Existing courses:
 - CIVL 4050 *Engineering Economics* Cr.Hrs.3. Introduction to engineering economics. Time value of money and discounted cash flow calculations. Comparing alternatives. Replacement analysis and life-cycle costing. Public sector engineering economy studies. Private sector engineering economy studies. Before- and after-tax analysis. Applications in cost-estimating. Applications in asset management systems. Basic accounting. Accommodating capital limitations. Dealing with inflation. Dealing with risk and uncertainty.
 - Between one (1) and six (6) courses at the 3000 and 4000 level in the student's respective engineering discipline, selected to correspond with the Confirmatory Exam topics assigned by APEGM and selected from the existing courses offered in the Faculty of Engineering undergraduate programs. Courses are selected in consultation with IEEQ staff and subject to approval by APEGM.

Additionally, IEEQ students will be required to spend a specified number of hours with a Language & Communication Consultant, in order to continue to enhance their English language communication competencies.

3. Outline the educational objectives of the program.

The educational objectives of the program are to:

- Provide formal recognition of foreign credentials and eligibility for professional licensure for IEGs with APEGM, the regulatory/licensing body for engineering in Manitoba;
- Provide IEGs an opportunity to obtain a formal Canadian university credential in the form of a post-baccalaureate diploma.

4. Describe the expected learning outcomes in terms of skills, knowledge, attitudes or other attributes which students will accrue as a result of their involvement in the proposed program.

The expected outcomes of the IEEQ program include:

- Upgrading and/or specialization of engineering knowledge and skills in the participant's respective engineering discipline, and integration of English vocabulary and North American codes and standards in use in the respective engineering discipline;

- Orientation of participants to the culture and ethics of the engineering profession;
- Enhancement of networking skills, increased professional contacts, and increased IEG contacts through participation in professional networking opportunities in the program;
- Increased competence in English language communication in technical and professional contexts;
- A minimum of four months of professional engineering experience in Canada and first-hand understanding of the Canadian professional engineering workplace; and,
- All of the above outcomes support an overall outcome of enhanced long-term employability and career development opportunities for IEEQ graduates.

5. If applicable, describe any selective admissions policy or specific criteria for students selecting this as a major field of study.

Admissions criteria include:

- A completed *Assessment of Academic Credentials* from APEGM, with an outcome of five or fewer Confirmatory Exams assigned to the applicant;
- Permanent Resident or Canadian Citizen status;
- English language proficiency demonstrated by a score of eight (8) in all four competency areas tested on the Canadian Language Benchmarks test.

6. Describe the extent to which this program is central to the institutional mission and planning priorities of the campus.

The University of Manitoba aims to not only educate students, but also facilitate their entry into the labour market and secure rewarding and satisfying careers. In addition, the University of Manitoba is actively involved in the credentials recognition processes of foreign-trained professionals, with existing programs in dentistry, agriculture, education, and medicine. This proposed program reflects both of these priorities of the institution.

7. If a similar program exists or is in the process of being developed elsewhere in the province, describe the similarities or differences in the credential to be awarded, the area(s) of specialization, and the specific academic content of the program or course of study.

No similar program is in the process of being developed in the province.

SECTION 2 Market Need and Market Demand for the Program

1. Where possible, state the specific local or provincial needs for graduates of the proposed program for the next 3 to 5 years. This should include projections of both ongoing and future demand in regions throughout Manitoba; as well as evidence and supporting data of market need for the program.

General labour force trends⁽¹⁻⁴⁾

- Between 1991 and 2001, immigrants represented 70% of net labour force growth, and are expected to represent 100% of net labour force growth in Canada by 2011.
- The Canadian workforce is aging, the near-retirement population is growing, and unprecedented international competition is driving industry to be innovative and build up a skilled workforce.

- Skill shortages are consistently ranked among the most serious concerns of private- and public-sector managers and labour leaders.

In sectors that employ significant numbers of engineers⁽⁵⁻⁷⁾

- Unemployment rates in engineering have been consistently below the national average: while the national unemployment rate varied between 7% and 11% between 1987 and 2002, the engineering unemployment rate exceeded 5% in only one year.
- The Canadian Manufacturers and Exporters 2005 Management Issues Survey cited shortages of skilled personnel as a key strategic challenge and a major constraint on performance improvement, innovation, and overall growth potential. Eighteen percent of companies cited difficulties in finding engineers.
- The Canadian Electricity Association expects 45% of current staff to retire by 2014 and observes a decline in enrollments in university and college enrollments that prepare students for careers in the electricity sector.
- The City of Winnipeg, who employs a significant number of engineers in Manitoba, cites an increased demand for engineers

Information from the engineering profession in Manitoba⁽⁸⁾

- 67% of members of the Association of Professional Engineers and Geoscientists of Manitoba (APEGM), the regulatory/licensing body for engineering in Manitoba, are over age 40, and 28% are over age 55.
- The number of new engineering graduates entering the Manitoba workforce is less than the demand.
- The profession (individual firms and umbrella groups representing the aerospace industry, consulting engineers, and the manufacturing sector) endorses the relevance and value of the IEEQ program.

Manitoba Job Futures is a joint project of the federal/provincial Labour Market Information Committee in Manitoba. Occupational profiles are continually updated by Labour Market Analysts in Manitoba Competitiveness, Training and Trade, and Service Canada, Manitoba Region. Manitoba Job Futures (<http://mb.jobfutures.org/home.cfm?lang=en&site=graphic>) cites the following outlooks for the employment of engineers in Manitoba.

*Employment prospects for **civil engineers** are expected to be **good** in the period 2007 to 2011. Public and private (especially Hydro) investment in heavy construction over the next few years should assure continued demand for persons qualified in this engineering specialty. The number of positions in Manitoba is estimated at 900 in 2007. In Manitoba, the deterioration of roads, bridges, sewers, and other aspects of municipal and provincial infrastructure will drive reconstruction or replacement projects during the forecast period. Employment is fairly evenly distributed across the province.*

*Employment prospects for **mechanical engineers** are expected to be **good** in the period 2007 - 2011. In 2007, the number of positions in Manitoba is estimated at 760. Although the rise in the Canadian dollar adversely affected some manufacturing firms, many local manufacturers have reacted to a highly competitive global market by changing production and marketing strategies and by continuing to automate production processes. Job opportunities will be more plentiful for qualified mechanical engineers with experience in research and design. Jobs are located in all regions of Manitoba.*

*Employment prospects for **electrical and electronics engineers** are expected to be **good** in the period 2007 - 2011. Employment in Manitoba in 2007 is estimated at 865. This engineering specialty has been growing in importance in recent years. In addition, the current workforce is older, on average, than the provincial workforce generally. There will be a significant number of job opportunities arising because of retirements in the next few years. A proportionally larger number of jobs are located in Winnipeg.*

Employment prospects for **industrial and manufacturing engineers** are expected to be **good** in the period 2007 - 2011. The number of positions in Manitoba in 2007 is estimated at 245. The demand for industrial and manufacturing engineers should continue as firms strive to attain improved and cost-effective methods of production. A proportionally larger share of jobs are located in Winnipeg, but they may be found in other regions.

Employment prospects for **computer engineers** are expected to be **good** in the period 2007 - 2011. Employment in Manitoba in 2007 is estimated at 345. As computer networks grow more complex, there will be a continuing demand for computer engineers to design, develop, and implement technologically sophisticated hardware. A proportionally larger share of jobs for computer engineers are located in Winnipeg.

References:

1. Canadian Labour and Business Centre. (2003a). *Perspectives on immigration: Findings from the Canadian Labour and Business Centre's survey of Canadian business, labour, and public sector leaders. Final Report.* Accessed July 18, 2007 at http://www.clbc.ca/research_and_reports/archive/report03310302.asp
2. Canadian Labour and Business Centre. (2004). *CLBC handbook: Immigration & skill shortages.* Accessed July 18, 2007 at http://www.clbc.ca/research_and_reports/archive/report11230401.asp.
3. Canadian Labour and Business Centre. (2005). *Engagement with regional stakeholders on integrating internationally-trained workers into the workforce.* Accessed July 18, 2007 at http://www.clbc.ca/research_and_reports/archive/report10120501.asp
4. Human Resources Development Canada. (2002). *Knowledge matters: Skills and learning for Canadians.* Report SP-482-02-02. Hull, QC: Government of Canada.
5. Canadian Manufacturers & Exporters. (2005). *2005-2006 Management issues survey: Winning strategies for the future.* Toronto, ON: Canadian Manufacturers & Exporters.
6. Canadian Council of Professional Engineers. (2003). *From consideration to integration, final report from phase I.* Ottawa, ON: Canadian Council of Professional Engineers.
7. Canadian Electricity Association. (2005). *Keeping the future bright: 2004 Canadian electricity human resource sector study.* Accessed July 17, 2007 at www.brightfutures.ca
8. Soonawala, N. (2007). Demand and supply of engineers in Manitoba. *Keystone Professional, fall 2007*, 19-21.

2. What are the probable employment destinations of program graduates?

It is expected that IEEQ graduates will find employment in Winnipeg and Manitoba. Inter-provincial mobility of engineering licensing allows them to pursue opportunities in other Provinces and Territories as well.

3. Where appropriate, did industry, business and/or any other pertinent groups play a role in the development of this program and/or commit resources to its future?

The Association of Professional Engineers and Geoscientists of Manitoba (APEGM) is the regulatory / licensing body for engineering in Manitoba. APEGM is a formal partner in the delivery of IEEQ, providing both applicant pre-screening for eligibility to the IEEQ program and formal recognition of program completion toward professional licensing requirements. APEGM has also been actively involved throughout the pilot phase of IEEQ (2003-2007) in developing a policy framework that is consistent with the other licensing pathways available to IEGs through APEGM. APEGM is committed to continuing this formal partnership.

Employers throughout the private and public sectors have supported the IEEQ Program through its pilot phase (2003-2007) by providing paid co-op placements to its participants. Throughout the pilot phase, a total of 20 employers provided a total of 39 co-op placements to IEEQ participants. The breakdown of employers by sector is as follows:

Public sector and Crown Corporations: 4 employers
Engineering consulting services: 8 employers
Manufacturers and Exporters: 7 employers
Aerospace: 1 employer

A single employer, **Manitoba Hydro**, has formalized its ongoing support for the IEEQ program by committing up to six (6) co-op placements per year to IEEQ participants, two (2) bursaries of \$1500 each per year to IEEQ participants, and one (1) long-term career development position per year to an IEEQ graduate.

Immigrant-serving agencies and language training programs are committed to providing exposure and referrals to the IEEQ Program to their IEG clients. These agencies include, but are not limited to, the International Centre of Winnipeg Career Mentorship Program, Success Skills Centre, and English for Engineering Professionals.

Engineers Canada (the business name of the Canadian Council of Professional Engineers) has endorsed the IEEQ Program as addressing five (5) of 17 recommendations in its multi-phase *From Consideration to Integration* project, aimed at streamlining the professional licensing and integration processes for IEGs in Canada (<http://engineerscanada.ca/fc2i/e/index.cfm>). Engineers Canada committed three years of funding (2005-2008) to support IEEQ's efforts to obtain a permanent status in Manitoba and for IEEQ to share information and training with other Canadian jurisdictions that wish to establish IEEQ-style programs.

4. How does the program correspond with the province's economic, social and cultural priorities?

- **Immigration:** Due to an aggressive strategy initiated by the Premier's Advisory Council in 2003 to increase immigration to Manitoba, the province went from welcoming approximately 3000 immigrants annually in the late 1990s to welcoming 10,000 immigrants annually in 2007, with a further goal to welcome 20,000 immigrants annually by 2017.
- In 1998, Manitoba was the first province to establish the **Provincial Nominee Program (PNP)** as an immigration tool to meet provincially-defined economic development goals. The PNP fast-tracks applicants for immigration on the basis of reported training, work experience, and potential to contribute to the provincial economy. Electrical, electronics, mechanical, and computer engineers are among the top 20 occupations selectively targeted by the PNP, and since at least 2003, "engineer" has been the top-ranked self-declared occupation of economic immigrants to Manitoba.
- The **Manitoba Immigrant Integration Program (MIIP)** reflects the government's strategic direction in integrating immigrant settlement initiatives with labour market issues and strategic economic objectives. MIIP provides funding to support economic and social integration of immigrants in Manitoba, including qualifications recognition projects. The IEEQ Pilot Project received full or partial funding through MIIP since IEEQ's inception in 2003.
- In the regulatory context, a Professional Engineer (P.Eng.) license is a legal requirement to practice professional engineering in Manitoba and Canada, and is a necessary credential for career advancement and mobility. **Legislation** recently introduced in the Manitoba Legislature will mandate all professional regulatory bodies to implement registration practices for foreign-trained applicants that are transparent, objective, impartial, and fair. IEEQ is one response to this mandate.

5. What potential does this program offer in terms of job creation and research and development?

IEEQ graduates are eligible for Member-in-Training registration with APEGM, and are eligible for Professional Engineer (P.Eng.) registration upon demonstration of four years' acceptable engineering work experience (of which up to three years can 'credited' from previous experience in the home country).

Once an individual is registered as a P.Eng., she or he is able to offer engineering services independently. Professional engineers in Manitoba have a long history of entrepreneurship and establishing new companies, and this extends to IEGs as well.

Through the pilot phase of the program, several IEEQ graduates have also pursued further research-focussed graduate programs in engineering and management. The IEEQ Program will continue to work with the Faculty of Graduates Studies, University of Manitoba, to support this pathway for those IEEQ graduates that wish to pursue it.

SECTION III *Student Demand for the Program*

1. What students is the program intended to serve?

IEEQ participants are:

- International engineering graduates (IEGs). All hold earned undergraduate degrees in an engineering discipline from their home countries, and many have a significant amount of professional engineering experience obtained outside of Canada as well;
- Immigrants to Canada, and most will have immigrated to Canada within two years prior to beginning the IEEQ program;
- Pursuing engineering licensing with APEGM and pursuing professional engineering employment in Canada; and,
- Mature students, generally between 30-50 years of age. Most will have families (spouses/partners and/or children).

2. What is the evidence that provincial students are not being adequately served within existing program offerings in Manitoba?

Currently, there is no other *university-based program* in Manitoba that offers foreign credentials recognition (FCR) to IEGs, since FCR in engineering is the mandate of APEGM, the regulatory/licensing body for engineering in Manitoba.

There is evidence that IEEQ offers a valuable alternative to other FCR (licensing) pathways offered by APEGM. APEGM has seen its caseload of IEGs increase steadily in recent years, from approximately 60 new applicants in 2002 to approximately 100 new applicants annually, by 2006. However, in the years 2002 through 2006, the number of applicants who successfully *completed* an APEGM exam program (regardless of the year in which they were assessed and began the exam program) never exceeded 41. These data (from APEGM) support the anecdotal observations that many IEGs abandon the licensing process with APEGM when they are trying to meet requirements through the traditional pathway.

The IEEQ Program is intended to offer an alternative which is time-effective and which sustains higher completion rates and lower attrition rates than the traditional licensing pathway. APEGM data indicate that two-thirds to three-quarters of assessed applicants are assigned five or fewer Confirmatory Exams by APEGM, and would thus become eligible for the IEEQ program.

3. Provide evidence of student interest and demand for the program.

Throughout the pilot phase of IEEQ (2003 - 2007), the number of applicants to the program consistently exceeded available space in the program. Normally, program staff saw twice as many applicants to the program as there was available space (not including ineligible applicants).

Student interest and demand is evidenced by:

- IEEQ staff give invited presentations to IEG audiences at information sessions hosted by immigrant-serving agencies and industry-sponsored career fairs for immigrants (monthly/bi-monthly);
- IEEQ staff routinely provide information to IEGs seeking to enter IEEQ, including out-of-province and out-of-country contacts (daily/weekly);
- APEGM staff routinely provide information and referrals to IEGs seeking to enter IEEQ (daily/weekly);
- IEGs are enrolling in *English for Engineering Professionals* course with the express objective of using the course as a stepping stone to prepare for IEEQ (personal communication, Kathleen Clarke, course coordinator).

4. What are the projected enrolments for the program?

2008/2009: 14-16 individuals
 2009/2010: 20-25 individuals
 2010/2011: 30 individuals
 2011/2012 and onward: 40 individuals

5. Which programs currently offered by the institution are projected to lose enrolment to this program?

No programs are projected to lose enrollment due to the IEEQ Program.

6. What are the proposed growth limits and minimum enrolments?

Growth limits: By 2011/2012, the Faculty of Engineering will have added teaching capacity by which to accommodate no more than 40 IEEQ participants annually.

Minimum enrollments: While IEG applicants to APEGM will fluctuate year over year, it is anticipated that the program (by 2011/2012) should not operate with less than 30 participants annually.

7. Project the number of graduates for the first 3 to 5 years of the program and, where appropriate, the anticipated number of program majors (full-time and part-time) for each of the first five years of the program.

2008/2009: 11-13 individuals
 2009/2010: 18-23 individuals
 2010/2011: 26 individuals
 2011/2012: 36 individuals

These figures assume that each cohort will experience approximately 10% non-completion, and 10% of participants that use more than one year to complete and are therefore counted into the next cohort.

IEEQ enrolls students in all six undergraduate engineering programs offered at the University of Manitoba. The allocation of students among the six disciplines is anticipated to be approximately as follows:

- Biosystems engineering: 10%
- Civil engineering: 30%
- Mechanical and/or manufacturing engineering: 30%
- Electrical and/or computer engineering: 30%

8. What steps have been taken to ensure participation and success in the program by under-represented groups, such as women, the disabled, minorities and aboriginal students?

The IEEQ program is itself a program developed specifically to serve an under-represented group. As a form of Access program, the IEEQ program components are designed to ensure participation and support the success of its participants. The IEEQ Program also draws on other campus services to support participants' individual needs related to gender, physical ability, language needs, and ethnic identity.

9. Will the program be available to part- time learners?

Yes.

SECTION IV Faculty Requirements

1. Provide a list of current faculty by rank and areas of expertise who will teach in the program.

IEEQ students will be taking course from the full range of current course offerings in the six undergraduate engineering programs at the University of Manitoba. These courses engage the full complement of faculty members in all specializations in the Faculty of Engineering, whose credentials include earned PhD degrees and range in rank from Assistant Professor to Professor. At times, courses may be offered by sessional instructors whose credentials include an earned graduate degree in Engineering and/or significant industry experience in the relevant topic area.

The instructor for the core courses ENG 4010 *Practicing Professional Engineering in Manitoba* and ENG 4012 *IEEQ Cooperative Education Assignment* is expected to be Marcia Friesen, P.Eng. Ms. Friesen is ranked as "Other Academic" in the Faculty of Engineering, with expertise in biosystems engineering, program development, and teaching & learning in engineering. Ms. Friesen holds a Bachelor degree in Agricultural Engineering, a Master of Education degree in Post-Secondary Studies, and is currently a Ph.D. student in Biosystems Engineering. She is also a registered P.Eng. in Manitoba with 13 years' professional experience in engineering practice and engineering education.

2. Will the program involve the hiring of new faculty or staff? If yes, indicate which additional faculty are to be hired and describe their qualifications.

The Faculty of Engineering will hire two additional staff members and six additional faculty to provide capacity for the IEEQ Program.

Additional staff engaged in day-to-day IEEQ program delivery:

- Academic Coordinator:
Qualifications: Bachelor degree in Engineering or Education, with additional education or training in adult education (or equivalent experience); minimum five (5) years professional experience; significant experience in programming with immigrants/newcomers to Canada; preferred qualification: significant experience working in the professional engineering community.
- Culture and Communications Consultant:
Qualification: Post-secondary education or training in adult education and adult ESL; minimum five (5) years professional experience; significant experience in programming with

immigrants/newcomers to Canada; preferred qualification: significant experience working in the professional engineering community.

Additional faculty to provide teaching capacity for up to 40 IEEQ students:

- Six additional faculty members at the rank of Assistant or Associate Professor, one in each of the following programs: biosystems, mechanical, manufacturing, civil, electrical, and computer engineering.
Qualifications: An earned PhD degree in an Engineering discipline and eligibility for registration with the APEGM; preference will be given to candidates who complement the academic needs and research profile of the Faculty, a demonstrated interest in design in their individual areas of specialty, and previous professional experience in industry or the public sector.

SECTION V Cooperative Arrangements

1. Describe the cooperative arrangements with other institutions and organizations that may be used to offer this program.

Outside of the partnerships between IEEQ, APEGM, and industry (see section II, question 3), no cooperative arrangements are initially being sought with other post-secondary institutions. As the University of Manitoba houses the only Faculty of Engineering in the Province, and since professional regulation is province-dependent, there are no obvious local partners being excluded by the lack of cooperative arrangements with other institutions.

2. Will the credits of the proposed program be fully transferable (in terms of both the credit as well as the grade) to other institutions in Manitoba?

Yes. IEEQ students will be registered in accredited courses, which will be transferable to other institutions as per the overall transfer-credit policies of the University of Manitoba and the institution to which the transfer is sought.

3. Does the program have an internship or practicum component? What attempts have been made to ensure that this program has both theoretical and applied modules?

Yes. The IEEQ program includes a mandatory four-month co-operative education (work experience) term in industry (see section I, question 2).

3. What provisions will be made in the program to enable students to receive credit for relevant learning previously achieved outside of the Manitoba post-secondary education system?

In order to meet the minimum credit hour requirements for a post-baccalaureate diploma, IEEQ students will be able to obtain up to 14 credit hours of transfer credit on the basis of a prior earned undergraduate engineering degree.

SECTION VI *Learning Technologies*

What use will be made in the program of modern learning technologies?

Course offerings in the undergraduate programs in the Faculty of Engineering are typically offered in a face-to-face, classroom-based delivery format. Implementation of learning technologies are at the discretion and initiative of the individual instructors. Common uses of learning technologies in the Faculty of Engineering include using the internet to host course notes, obtain and submit assignments, and internet-mediated remote laboratories.

SECTION VII *Resource Requirements*

1. Describe the adequacy of existing library resources to support the proposed program. Indicate how the institution will overcome any deficiencies.

Because the IEEQ students are enrolled in existing undergraduate engineering courses, no additional library resources are required.

Librarian statements regarding the two new courses ENG 4010 *Practicing Professional Engineering in Manitoba* and ENG 4012 *IEEQ Cooperative Education Assignment* indicate that existing library resources will adequately serve these two courses.

2. Are existing computer facilities adequate to support the new program?

Yes, existing facilities are adequate. The Faculty of Engineering contains two computer labs as well as department-specific computer labs. The engineering building is also substantively covered by wireless service for students with personal laptop computers. All students have access to all computer labs on the campus as well.

3. How will the proposed program impact on the use of existing infrastructure and equipment?

No substantive impact is expected.

4. Describe any additional facilities, facility modifications, and equipment that may be required for the proposed program.

The program will require additional space allocation from the Faculty of Engineering to provide office space for two additional staff and six additional faculty, as well as a student lounge / study area dedicated to use by IEEQ students.

SECTION VIII *Financial Considerations*

1. What are the total financial resources required to offer this program? Include estimated initial and ongoing funding requirements.

One-time costs (in 2007 dollars): \$419,500 to be disbursed between 2007 and 2010.
Ongoing costs (in 2007 dollars): \$1,039,000 annually.

2. Of the financial resources required to offer this program, how much will come from a reallocation of existing funds and how much from new funds?

All resources for ongoing costs will come from new funds. An annual baseline commitment of \$1,039,000 was extended by the COPSE to the University of Manitoba, via a letter to the University President dated July 12, 2007.

3. Discuss the internal reallocations of financial resources which will occur to support this program.

No reallocation of internal resources is anticipated.

4. What percentage of program costs will be accrued through tuition fees?

At full capacity (40 participants/year), it is anticipated that approximately \$152,000/year will be accrued through tuition fees. This revenue will be amortized against the on-time costs, for which no external or internal funding commitment exists.

5. Discuss the impact of the program's estimated enrolment on the institution's overall tuition revenues.

Overall impact to the University's tuition revenues, due to 40 additional students' tuition revenues, will be negligible.

6. How will the proposed program be funded if enrolment projections are not met?

Funding commitments are for baseline funding.

SECTION IX *Program Consultations and Evaluations*

1. What consultations have occurred with professional associations, employers, graduates of similar programs, and other educational institutions regarding this program?

Consultation for the development and implementation of the pilot phase of IEEQ have occurred between the IEEQ program and APEGM. These consultations are primarily documented in the minutes of the APEGM Academic Review Committee, which meets at least five (5) times per year. Consultations began in spring 2003 and are ongoing, with the purpose to monitor program progress and develop policy. More recently, consultation has also taken place between IEEQ and an APEGM-IEEQ Liaison Committee.

2. Please provide evidence of academic quality by submitting reports from two similar institutions as well as from the relevant professional association(s), if appropriate.

Two reports are attached:

- *Outcomes, Perceptions, and Experiences of IEEQ Participants, 2003 – 2006*, by Marcia Friesen, P.Eng., IEEQ Pilot Program Director, submitted to Manitoba Labour & Immigration and APEGM, January 2007.

Excerpt:

Participants perceive a number of strengths in IEEQ, including the emphasis on cultural integration and cultural understanding, support gained by being part of a cohort with other IEEQ participants, professional integration (access to employment and building understanding of Canadian engineering business practices), and the direct recognition of IEEQ within the licensing process with APEGM. Participants perceived their co-op work terms to constitute solid engineering work experience commensurate with their engineering background, interest, and/or capabilities. Quantitative and qualitative data from participants support the finding that IEEQ program objectives are being met. Additional validation of the program's effectiveness is evident in anecdotal data from co-op employers. In addition, the program has won a provincial and national award in 2006, and is recognized by CCPE as a model of best practices for qualifications recognition of internationally-educated engineers.

- *Report to the Academic Review Committee for the Academic Review Committee 2007 Review of the University of Manitoba IEEQ Pilot Program, by Academic Review Committee sub-committee members, March 8, 2007.*

Excerpt:

The subcommittee concludes that the IEEQ [pilot] program provides a satisfactory and efficient alternative to the confirmatory examination program for selected candidates. Evidence indicating that the IEEQ program is achieving its primary objective, which from the ARC perspective is the correct assessment of the academic backgrounds of confirmatory examination candidates, includes the collective view of the ARC committee members regarding the adequacy of the number, depth and breadth of the courses assigned in IEEQ programs; the grade distribution achieved by IEEQ participants; anecdotal evidence from employers of IEEQ participants comparing IEEQ graduates and Canadian engineering graduates; and the successful registration of IEEQ participants who have acquired sufficient work experience. Additional confidence in this interpretation could be obtained by the tracking of the IEEQ participants through the EIT process. The subcommittee express[es] its appreciation to IEEQ program staff for their valuable contribution to the academic assessment process.

3. Describe the procedures for institutional evaluation of the program during and subsequent to implementation.

- All courses in which IEEQ students are enrolled are subject to regular reviews by the Canadian Engineering Accreditation Board.
- Internally, the IEEQ program implements various program evaluation instruments, including focus groups with graduating participants, and one-year and two-year follow-up questionnaires with IEEQ alumni.
- APEGM engages in periodic evaluations of the IEEQ Program (see Section IX, question 2). Discussions are underway to clarify the nature and frequency of this evaluation going forward.



Internationally- Educated Engineers Qualification Pilot Program

Outcomes, Perceptions, and Experiences of IEEQ Participants, 2003 – 2006

Submitted to: Manitoba Labour & Immigration
and The Association of Professional Engineers &
Geoscientists of Manitoba

January, 2007



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Executive Summary

This report highlights the outcomes, perceptions, and experiences of the first three cohorts of the IEEQ Pilot Program, University of Manitoba. Quantitative and qualitative data were obtained relative to program participation and completion, and through focus groups and follow-up questionnaires systematically administered to all IEEQ cohorts. These data were gathered for the purposes of program assessment and evaluation. Key findings are as follows:

- In the first three cohorts (2003/2004 through 2005/2006), 30 participants entered IEEQ, of which 24 have successfully completed IEEQ and two additional participants are expected to successfully complete the program by May 2007. To date, four participants have left the program prior to successful completion. The fourth cohort of nine participants is currently enrolled and in progress.
- Of the 24 alumni to date, 17 are registered as an EIT and seven are registered as a P.Eng. with APEGM.
- Participants perceive a number of strengths in IEEQ, including the emphasis on cultural integration and cultural understanding, support gained by being part of a cohort with other IEEQ participants, professional integration (access to employment and building understanding of Canadian engineering business practices), and the direct recognition of IEEQ within the licensing process with APEGM.
- Participants identified the primary challenges of the university-based components of IEEQ to be the challenges of transition back to academic study, including lifestyle changes and adaptation to the Canadian university system. In response, IEEQ has developed and integrated academic, social, and financial supports into the program delivery model.
- Participants perceived their co-op work terms to constitute solid engineering work experience commensurate with their engineering background, interest, and/or capabilities. The components of IEEQ that facilitated cultural integration and understanding were perceived to be the most influential in preparing participants for the co-op term.
- Over the 24 months since completing IEEQ, past participants reported career development gains in the nature of their engineering employment, salaries, and progress in meeting the licensing requirements with APEGM.
- Quantitative and qualitative data from participants support the finding that IEEQ program objectives are being met. Additional validation of the program's effectiveness is evident in anecdotal data from co-op employers. In addition, the program has won a provincial and national award in 2006, and is recognized by CCPE as a model of best practices for qualifications recognition of internationally-educated engineers.

List of Acronyms

The following acronyms are used in this report:

APEGM	Association of Professional Engineers and Geoscientists of Manitoba
ARC	Academic Review Committee of APEGM
CCPE	Canadian Council of Professional Engineers
FCR	Foreign Credentials Recognition
IEEQ	The Internationally-Educated Engineers Qualification Pilot Program, University of Manitoba. IEEQ is a 12-month program, in which participants complete eight months of senior-level engineering courses, a four-month co-op work term, and a co-op report. To date, APEGM has recognized successful IEEQ 'graduates' as being academically qualified for registration as an Engineer-in-Training.
IEEQx	Identifies the respective program cohort; for example, IEEQ2 is the second cohort to participate in IEEQ.
IEG	International Engineering Graduate (internationally-educated engineer)
PPEM	Practicing Professional Engineering in Manitoba, a core course in the IEEQ Pilot Program. This course was developed for and is offered exclusively to IEEQ participants. The focus of the course is on cultural differences & cultural integration, the regulation and organization of professional engineering in Canada, engineering employment culture and business practices, and professional engineering ethics.

Introduction

Increasingly, the immigration of skilled workers is considered a powerful demographic and economic force to address labour market needs and to facilitate the current and continued strength of the Canadian economy. In Canada, immigrants made up 70% of labour force growth in the 1990s and are expected to make up 100% of labour force growth by the year 2011^{1,2}.

Internationally-educated engineers (also known as international engineering graduates, or IEGs) comprise a large proportion of recent immigrants and are theoretically well positioned to enter the labour market. In addition to a 'graying' workforce, the engineering profession in Canada has enjoyed higher labour market growth over the last ten years than the general labour market (17% and 9.5% respectively) and rates of unemployment consistently below the national average for the last 15 years¹.

In 1999, Manitoba accepted approximately 3500 immigrants annually. At that time, the province embarked on an aggressive – and successful – program to increase immigration, to the extent that Manitoba will accept approximately 10,000 immigrants in 2007, with a projection to increase that number to 20,000 by 2017.

In this context, the IEEQ Pilot Program (IEEQ) was developed in 2003 as a licensing pathway for IEGs, which provided an alternative to a Confirmatory Exam program with the Association of Professional Engineers & Geoscientists of Manitoba (APEGM). Through its Academic Review Committee, APEGM determines which IEGs are eligible for IEEQ, monitors participants' progress while in the program, and accepts successful completion of IEEQ as an acceptable and complete alternative to a Confirmatory Exam program for the purpose of academic qualification. At that time, the IEG is eligible for registration as an Engineer-in-Training with APEGM. The complete conceptual framework of IEEQ, including the regulatory context, motivations, structural features, and delivery features, is outlined in reference [3].

Purpose and Scope

Since 2003, three program cohorts (referred to as IEEQ1, IEEQ2, and IEEQ3, respectively) have completed IEEQ and the fourth cohort (IEEQ4) is currently in progress. At the request of both Manitoba Labour & Immigration and the APEGM, this report has been prepared to provide quantitative and qualitative assessment and evaluation of the program to date. This report assumes the reader to have a basic understanding of the IEEQ program structure and components.

This report focuses on the outcomes, experiences, and perceptions of former participants of the IEEQ Pilot Program, as derived from readily available participant data and from findings of focus groups and follow-up questionnaires systematically administered to IEEQ cohorts. The design of evaluation measures which fall under human subjects research have been approved by the University of Manitoba Research Ethics Board.

This report provides a preliminary picture of program outcomes, on the basis that further data collection from the first three cohorts is scheduled through fall 2008.

Limitations on Scope

Several additional sources of feedback from IEEQ participants support the findings outlined in this report. These sources include participants' co-op reports (as documentation of their co-op work term, the nature of their responsibilities, reflections on the work term in relation to their past experience, expectations, and goals, and reflection on insights gained relative to cross-cultural issues), participants' contributions to an on-line discussion board, and the nature and extent of participation in support activities.

Beyond participants, other stakeholders in IEEQ are the Faculty of Engineering, University of Manitoba, APEGM, and engineering employers. To date, we have not gathered information from these stakeholders in a systematic way, with the exception of discussions with employers regarding participants' performance during the co-op term. These discussions take place at the mid-point and the end of the co-op term, and often happen in informal, semi-structured ways.

All of these additional sources comprise human subjects research and, to date, have not been submitted to the Research Ethics Board for approval for formal

program evaluation research. Information derived from these sources must be viewed as anecdotal only.

IEEQ Participants as a Subset of IEG Applicants to APEGM

APEGM, via the Academic Review Committee (ARC), continues to assess the academic background of every IEG that submits a completed application for an *Assessment of Academic Credentials*. As indicated in Table 1, the trend of the past five years has been of a general increase in the total number of applicants to APEGM on an annual basis, although this pattern is not conclusive. Applicants assigned Confirmatory Exams, as a percentage of total applicants, appears to be generally increasing over time, and the number of applicants eligible for IEEQ under the current eligibility criteria also appears to be generally increasing over time.

Applicants eligible for IEEQ under the current eligibility criteria, as a percentage of total applicants appears to be relatively stable, and captures a clear majority of total applicants to APEGM.

TABLE 1: IEG APPLICANTS TO APEGM

	2002	2003	2004	2005	2006
Total IEG applicants	65	74	117	116	91
IEG applicants assigned Confirmatory Exams, % of total IEG applicants	58%	62%	59%	72%	78%
IEG applicants eligible for IEEQ (five or fewer Confirmatory Exams)	38	43	62	77	59
IEG applicants eligible for IEEQ (five or fewer Confirmatory Exams), % of total IEG applicants	58%	58%	53%	66%	65%

Note: Data supplied by APEGM as at December 2006

In its current state as a pilot program, the capacity of IEEQ is limited to 12 participants per year. In an intended permanent state, IEEQ is considering a capacity of 40 participants per year. This target was initially determined with data from Manitoba Labour & Immigration, indicating that approximately 100 to 140 IEGs immigrate to Manitoba annually (principal applicants only, not including spouses who may also be IEGs). APEGM data with respect to annual IEG applicants also support to this target capacity as a viable goal. In addition, IEEQ staff consider other sources of future IEEQ participants beyond new immigrants / applicants, including IEGs that may have abandoned the licensing process in past years but may be interested in the IEEQ pathway if program capacity were

available, and IEGs who are working in engineering or engineering-related employment in an unlicensed capacity and who would identify benefits in registering with APEGM.

Further data from APEGM is pending, in order to assess the time-effectiveness and the overall completion rates of IEGs who take IEEQ as a licensing pathway, relative to other licensing pathways with APEGM (APEGM Confirmatory Exam programs, courses-in-lieu programs, etc.).

Assessment & Evaluation Methodology

Within IEEQ, *assessment* is defined as the systematic gathering and analyzing of information with the purpose to inform ongoing program development, and *evaluation* is defined as a systematic process of determining the extent to which program objectives are achieved. In practice, a given measure (and derived findings) can support both assessment and evaluation goals. The measures considered in this report include:

- Readily-available participant data relative to program participation and completion, as tracked by IEEQ;
- Focus groups with IEEQ cohorts; and,
- Follow-up questionnaires with IEEQ cohorts.

The focus groups and follow-up questionnaires have been developed by IEEQ and administered to cohorts on an ongoing basis, beginning with the first cohort. They comprise the key instruments to explore participants' experiences in and perceptions of IEEQ.

The focus group and follow-up questionnaires were (continue to be) developed and administered according to established designs for qualitative and mixed-method research, including consideration of participant recruitment, data collection, data analysis, and confidentiality measures^{4,5}. In all cases, participation was (continues to be) voluntary and the research design ensures that data provided by participants from the focus group and questionnaires cannot be traced to any individual participant. The program evaluation measures were reviewed and approved by the University of Manitoba Research Ethics Board prior to implementation, and continue to be reviewed by the Research Ethics Board on an annual basis.

Focus Group

The purpose of the annual focus group is to explore participants' perceptions of and experiences in IEEQ during the academic requirements of the program (September through April). All focus groups are facilitated by an experienced moderator and researcher unrelated to IEEQ, but familiar to some participants through her work in language assessment and training. The facilitator uses a semi-structured interview protocol to guide systematic data collection. The results are compiled by the facilitator and returned to the participants for review, corrections, and additional feedback. The final compiled results are then provided to the IEEQ Director.



Follow-up Questionnaires

Follow-up questionnaires are administered to participants at nine months and 24 months after their successful completion of IEEQ. The purpose of the nine-month follow-up questionnaire is to explore participants' perceptions of and experiences in the IEEQ co-op work term (May through August), and subsequent career development since completing IEEQ. The purpose of the 24-month follow-up questionnaire is to explore further career development since completing IEEQ.

The follow-up questionnaires consist of a combination of closed-ended and open-ended questions. Participants are alerted by e-mail that the questionnaire is going to be administered, and the questionnaires are mailed to their last known address. Four weeks later, one subsequent reminder is sent (by e-mail), encouraging them to complete and return the questionnaire. The responses on returned questionnaires are compiled and word-processed by the IEEQ Program Assistant, and the summary provided to the IEEQ Director.

In the sections of the questionnaire which explore career development since completing IEEQ, the nine-month and 24-month questionnaire consist of the same questions to allow for parallel comparisons. To preserve anonymity, participants are asked not to put their name or identifying information on the questionnaire. Additionally, all questions are written so that no other identifying information (age, ethnicity, gender, engineering discipline, industry sector, etc.) is requested. Participants are assigned a tracking number by the IEEQ Program Assistant, and the tracking number appears on the questionnaire. This will allow us to track the career development of an individual between the two questionnaires, while preserving anonymity.

Participation and response rates in the focus group and follow-up questionnaires are shown in Table 2. A complete discussion of the assessment and evaluation framework for IEEQ is available in reference [6].

TABLE 2: PARTICIPATION AND RESPONSE RATES TO ASSESSMENT & EVALUATION MEASURES

Cohort	Focus Group	Nine-mth follow-up questionnaire	24-mth follow-up questionnaire
IEEQ1 (n=5)	n=5 (March 2004)	n=2 (June 2005)	n=4 (Sept 2006)
IEEQ2 (n=13)	n=9 (May 2005)	n=8 (June 2006)	Pending (Sept 2007)
IEEQ3 (n=8)	n=3 (May 2006)	Pending (June 2007)	Pending (Sept 2008)
IEEQ4 (n=9)	Pending (May 2007)	Pending (June 2008)	Pending (Sept 2009)

Notes: All 12 data collection activities above have been approved by the Research Ethics Board.

N's (for each respective cohort) reflect the number of participants who successfully completed IEEQ (or for whom successful completion is pending)

Findings

As a relatively new program with small cohort numbers, combined with the long-term nature of professional integration and career development post-IEEQ, these findings should be interpreted as preliminary and are not necessarily generalizable to IEGs generally. Preliminary findings must be contextualized to the three cohorts that have completed the program and the fourth cohort in progress. Additional data for the first three cohorts will be obtained through fall 2008, as milestones are reached (e.g. additional follow-up questionnaires as per Table 2). Qualitative research is intended to be applied with small numbers of participants, and these small numbers do not invalidate the findings. However, findings cannot *automatically* be generalized to entire populations. The contribution of qualitative methods is in their ability to answer questions of 'how' and 'why', which complement quantitative findings of 'what' is occurring in a given situation. These comments are offered as standard cautions to those that may be unfamiliar with qualitative research designs. Additionally, small n's preclude any extensive statistical analysis of the quantitative portions of the data.

Participant Data

PROGRAM PARTICIPATION AND COMPLETION

TABLE 3: SUMMARY OF IEEQ PROGRAM COHORTS (AS AT JANUARY 2007)

Cohort	Entered IEEQ	Completed IEEQ	Not Completed	EIT*	P.Eng.*	Currently Employed in Eng'g**	Other **
IEEQ1 (2003/2004)	7	5	2 – voluntary withdrawal from program	2	3	4	1 – current status unknown
IEEQ2 (2004/2005)	14	13	1 – exited due to academic deficiencies	9	4	8	2 – engineering-related employment 2 – moved out of province and current employment not known 1 – employed in unrelated field by choice
IEEQ3 (2005/2006)	9	6	2 – completion pending in 2007 1 – exited due to failure to comply with program policies	6		6	
IEEQ4 (2006/2007)	9	(pending fall 2007)					
Totals:	39	24, plus 11 pending in 2007		17	7	18	

* Of those that successfully completed IEEQ

** Of those that successfully completed IEEQ and as per last contact

PARTICIPANTS' COUNTRIES OF ORIGIN (IEEQ1 - IEEQ4)

India (6)
Argentina (5)
Pakistan (4)
Macedonia, Bulgaria, and Romania (4)
Russia, Ukraine, & Uzbekistan (4)
China (3)
Colombia (3)
Other (1 each): Ethiopia, Mexico, Nigeria, Cuba, Trinidad, Bangladesh, Poland, Afghanistan, Sri Lanka, Iran.

PARTICIPANTS' ENGINEERING DISCIPLINES TO DATE (IEEQ1 - IEEQ4)

Mechanical (13)
Electrical (12)
Civil (9)
Computer (3)
Agricultural (1)
Industrial (1)

PARTICIPANTS' CO-OP EMPLOYERS, BY SECTOR (IEEQ1 - IEEQ3)

Private Sector:

Engineering Consulting (5)
Manufacturing (4)
Aerospace (1)
Agri-business (1)

Public Sector: (2)

Some employers have hired more than one IEEQ participant for a co-op term, therefore the total number of employers does not match the total number of participants).



Participants' Perceptions of and Experiences in Academic Requirements (Focus Group Findings)

The focus group asked participants to reflect on their experiences during the academic portion of IEEQ, including the strengths of IEEQ, the weaknesses of IEEQ, and recommendations for changes to the program.

Overwhelmingly, participants characterized their experience in the university-based requirements of IEEQ as one of challenge, and the **primary challenge was that of transition**. Participants elaborated 'transition' challenges in two main areas: entering into university-level studies after significant periods of time since their last university attendance, adjusting to an unfamiliar university system, studying in a second language, and needing to develop new routines and habits around academic requirements (studying, assignments). The second area of 'transition' challenge related to coordinating university studies while juggling commitments to family and community, acculturation, adjustments to climate, and employment: *"after being out of university for many years it is difficult to come back to school...[and] added responsibilities impact the adjustment"*.

Participants identified a number of **strengths and benefits related to IEEQ** as they had experienced it to date, summarized as follows:

- IEEQ provides a vehicle for re-entry into the engineering profession in a new country that is perceived to be better than and preferable to writing Confirmatory Exams, for reasons that IEEQ is perceived to have more extensive and better support mechanisms in place than the Confirmatory Exam route, it is perceived to be more time-effective, and it provides documented education from a Canadian university: *"this system [is a] fast track, not short cut, and is preferred to the traditional route"*.
- IEEQ's emphasis on cultural integration was identified as strength and benefit by participants, both in terms of the culture of Canada and the professional and business culture of engineering. Participants identified program components that facilitated their cultural integration: the mandatory course Practicing Professional Engineering in Manitoba (PPEM); industry tours; exposure to a network of professional engineers through professors, IEEQ staff, guest speakers in PPEM, and engineers-in-residence; and, the immersion (difficult, yet necessary) into an English-speaking environment. Participants described the benefit as *"more tolerance and understanding of expectations...and insights [into] cultural differences in the Canadian context"*.
- Participants perceived significant support by being part of an IEEQ cohort, in terms of structured contact both to program staff and to their fellow IEEQ participants: *"the time together connecting with other immigrant students in this class was very important to encourage and inform each other"*. Participants of IEEQ2 and IEEQ3 valued contact to past IEEQ cohorts as well.
- The participants identified value in the program's flexibility to support varied motivations, including licensing with APEGM, labour market entry, gaining new knowledge or upgrading knowledge, and/or preparing for graduate studies.

Apart from personal challenges, participants were asked to consider **weaknesses of IEEQ** itself, as they had experienced it to date. These findings, primarily from

the first cohort, were instrumental in developing and modifying the program from year-to-year and are considered in a later section entitled *Assessment Purpose: Ongoing Program Development*. All three cohorts expressed some degree of frustration and dissatisfaction with the academic assessment process within APEGM specifically, and credentials-based vs. qualifications-based assessment processes more broadly. Participants' comments in this area relate to fundamental assumptions and decisions that underlie the administration of engineering licensing in Canada, are far beyond the scope and control of IEEQ, and therefore are not discussed any further here. However, these findings did lead to increased emphasis in PPEM and participant interactions on ensuring a factual understanding of the licensing process, the legal foundations of self-regulation, and self-regulation as both privilege and responsibility.

Participants were further asked to suggest **recommendations for changes to IEEQ**, and most of the comments that related to issues within the scope and control of IEEQ were addressed in some manner. This is outlined in more detail in a later section entitled *Assessment Purpose: Ongoing Program Development*. Several recommendations for change relate directly to the delivery of IEEQ but cannot be implemented at this time. These include a recommendation for 'structured integration' or deliberate inclusion of IEEQ participants into formal and informal groups with the so-called typical undergraduate engineering students, so that IEEQ students can benefit from the informal information and resource networks that exist within these cohorts. Participants also consistently recommended a part-time program option which would extend the program length from one year to two years. While the program remains in pilot phase, the program delivery options remain rather limited. One aspect of IEEQ which participants consistently recommended *not* be changed is the core course PPEM.

Participants' Perceptions of and Experiences in Co-op Work Terms (Nine-month Follow-up Questionnaire Findings)

The first part of the nine-month follow-up questionnaire asked participants to reflect on their experiences in the co-op portion of IEEQ, by a combination of open-ended and closed-ended questions. Key findings are summarized below:

- Provided with APEGM's definition of **acceptable engineering work experience**, participants self-assessed the majority of their assignments and roles during the co-op work term to qualify as engineering work: "*substantially engaged [in engineering work]*". Participants reported a high degree of congruence between their co-op assignments and their engineering background, or a mixed degree of congruence with the qualifier that their assignments matched their interests (if not their background). In some cases, re-focusing their engineering expertise into new industries in Canada was a known necessity: "*I used a lot of my background; also, I had to learn new topics*". Further, participants generally reported a moderate or high degree of congruence between their co-op assignments and their self-assessed overall technical capabilities: "*it was a little below my technical engineering capabilities but that was perfect for a beginning*".



- Participants reported receiving **training** in diverse areas, including engineering field skills, safety training, and software skills. Often, training was provided within a standard company orientation program.
- While the incidence of **formal feedback** on their performance was reported to be infrequent, participants generally reported receiving appropriate amounts of informal feedback, primarily from supervisors but also from colleagues. The majority of participants further reported very positive relationships with their co-workers: *"[I was] quickly accepted in the group. ... excellent teamwork and cooperation"*.
- Participants did *not* perceive the four-month co-op work term to have a significant benefit in developing a **professional network** beyond their immediate organization, and in the case of larger organizations, beyond their immediate department or work group. Some participants reported increased interaction with clients or contractors toward the end of the four-month term.
- The **most significant challenges** that participants perceived during their co-op work term related to increased self-awareness of language and communication weaknesses in both the technical and social realms: *"writing professional reports and general writing"* and *"following the topic in coffee break and lunch"*, and technical challenges: *"regulations"* and *"new kind of design"*.
- The component of IEEQ that facilitates cultural understanding and integration, both to the culture of Canada and to the culture of engineering in Manitoba was identified as the **most significant aspect of the academic part of the IEEQ** that helped prepare participants for their co-op term: *"PPEM prepared me to understand the way that my co-workers act and how to respond to determine the situation"*. To a lesser degree, participants also identified technical courses as valuable preparation for their co-op term: *"time and again I find myself going back to those fundamental calculations in my job"*.
- Participants were asked to identify their **salary received during the co-op work term** within pre-defined salary ranges on the questionnaire. Most participants reported equivalent hourly wages equally divided between the \$14-\$18 range and the \$18.01 - \$22 range. Most participants had ambivalent feelings toward their compensation: *"fair"*, *"acceptable"*, *"reasonable"*.
- Participants again identified a number of **benefits** they perceived relative to their participation in IEEQ, with the majority of responses relating to professional integration and including access to employment, developing cultural understanding, and the program's direct link with the licensing process in Manitoba: *"it helped open the door to the profession by the co-op work term, and helped us get ready for the challenges of the Canadian workplace, and the emphasis on professional licensing"*. To a lesser extent, participants felt that they derived academic benefits, including more engineering knowledge and English engineering vocabulary. When compared to participants' perceptions of the strengths of the IEEQ program expressed in the focus groups, their responses demonstrate an increased recognition of benefits related to their needs and challenges around licensing and cultural integration.

Participants' Career Development Post-IEEQ (Nine-month and 24-month Follow-up Questionnaire Findings)

The second part of the nine-month follow-up questionnaire and the entire 24-month follow-up questionnaire asked participants to characterize their career development in the time since completing IEEQ, within pre-defined parameters on the questionnaires. Key findings are summarized in Table 4.

TABLE 4: COMPARISON OF RESULTS OF NINE-MONTH TO 24-MONTH FOLLOW-UP QUESTIONNAIRE, FOR COHORTS

Career Development Parameter	Nine-month follow-up questionnaire (IEEQ1 + IEEQ2, n=10)	24-month follow-up questionnaire (IEEQ1, n=4)
<i>Employment Status</i>		
Engineering employment	7	2
Engineering-related employment	2	2
Unemployed	1	0
<i>Self-assessed Nature of Engineering Employment*</i>		
Duties*, level	2 to 3	2 to 5
Recommendations*, level	2 to 3	3 to 5
Supervision Received*, level	3 to 4	3 to 6
Leadership Authority*, level	2 to 3	3 to 5
<i>Other</i>		
Salary range (mean)	\$33,150 to \$53,700 (\$42,800)	\$34,000 to \$66,000 (\$55,250)
Registered as EIT	10	1
Registered as P.Eng.	n/a	3

* Using the Professional Engineering Classification Rating Guide, excerpted from APEGM annual salary survey tools, and included as **Appendix A**.

At the nine-month follow-up, all but one respondent reported being employed, and of those employed, seven (7) were engaged in engineering and two (2) were engaged in engineering-related work. Of those employed, all reported doing what they wanted to be doing at that time, and all reported that their employment was related to their co-op employment in some way.

At the 24-month follow-up, all respondents reported being employed, two (2) in engineering and two (2) in engineering-related work. However, all reported doing what they wanted to be doing at that time, and all reported that their employment was related to their co-op employment in some way.

At the nine-month follow-up, all respondents reported being registered as an EIT with APEGM, and the majority had begun to submit reports for work experience

credit to the Experience Review Committee of APEGM. Of those that had submitted reports for experienced gained *outside* of Canada (and had received assessment results by the time of the questionnaire), four of five respondents reported receiving the maximum possible three years' of experience credit from the Experience Review Committee. Of those that had submitted reports for experienced gained in Canada *during and after* the IEEQ program (and had received assessment results by the time of the questionnaire), all respondents reported receiving full credit for all experience submitted for review. This outcome confirms the nature of the co-op placements as providing acceptable engineering work experience, and the participants fulfilling these roles satisfactorily.

At the nine-month follow-up, exactly half of respondents reported having written and passed the National Professional Practice Exam, and the other half reported uncertain timelines of when they intended to write the exam: "*maybe next year*". A possible explanation for this finding is that engineering employment was a primary motivator to participate in IEEQ, and if this goal has been fulfilled, the importance of full licensing for ongoing career advancement and mobility may only emerge with time.

At the 24-month follow-up, three respondents reported being registered as a P.Eng. The fourth respondent expected to be registered as a P.Eng. within 18 months, having received credit for four years' engineering experience and needing only to write the National Professional Practice Exam. Three of the four respondents reported receiving the maximum allowable three years of credit for engineering experienced gained abroad, and all respondents had received full or near-full credit for engineering experience gained during and after the IEEQ program. However, respondents were significantly less successful in receiving credit for engineering experience gained in Canada *but prior to* participating in IEEQ. A possible explanation is that participants were generally employed in engineering-related (technologist, technician) roles prior to participating in IEEQ; this possible explanation is also in line with our anecdotal understanding that the co-op term in IEEQ is a prime motivator for applicants to participate in the program.

At the nine-month follow-up, the clearly majority of respondents answered 'yes' when asked if they were more likely to stay in Manitoba as a result of the IEEQ Pilot Program. A minority of respondents were neutral, and none said 'no'.

At the 24-month follow-up, three of four respondents believed that they would *not* have been in the same or similar position in their engineering career in Canada without having attended IEEQ. Nonetheless, participants were asked if they were more likely to stay in Manitoba as a result of the IEEQ Pilot Program. With 24 months of hindsight, one respondent responded 'yes', while three were neutral.

On a macro level, the consolidated results of the nine-month relative to the consolidated results of the 24-month follow-up questionnaires indicate career development gains for former IEEQ participants. These gains are observed in the nature of respondents' employment (as per the Professional Engineering Classification Rating Guide), salaries, and progress in meeting the requirements of the Pre-Registration (Engineer-in-Training) program with APEGM.

By assigning tracking numbers to the individual questionnaires, we intended to follow career development on an individual basis (in addition to a cohort basis) over the same period of time as well. To date, this ability to assess changes on an



individual basis is only available for the two participants of IEEQ1 that responded to both the nine-month and 24-month follow-up questionnaires.

For one of these two respondents, career development gains between the nine-month and the 24-month follow-up were significant. The respondent went from being unemployed (nine-month follow-up) to being employed in engineering work, earning \$60,000/year, and being registered as a P.Eng. (24-month follow-up).

For the second respondent, career development gains during the same period of time were more modest. In self-assessing the nature of their employment (as per the Professional Engineering Employment Classification Rating Guide), the respondent reported a gain of one level in Duties and Leadership Authority and/or Supervision Exercised, and no change in Recommendations, Decisions, and Commitments and Supervision Received. Salary gains were also modest at 2.5% overall, and the respondent remained an EIT with the National Professional Practice Exam outstanding.

Assessment Purpose: Ongoing Program Development

One of the two goals of the assessment and evaluation activities is to provide valid data for ongoing program development. Year over year, program modifications were made based on participants' perceptions of the weaknesses of the IEEQ program, as articulated during the focus groups and the nine-month follow-up questionnaires. In 2003, IEEQ was conceptualized as a program that provides a licensing pathway to meet APEGM requirements for academic qualification, comprised of eight months of senior level engineering courses, a mandatory course PPEM, and a four-month co-op term. Currently, IEEQ continues to be conceptualized as such, and additionally delivered within a support system for participants modeled on Canadian Access programs (and in particular, the ENGAP program for aboriginal students in the Faculty of Engineering). Access programs deliver student support along three lines, including academic, social, and financial supports.

The majority of supports were motivated by feedback from the first cohort, IEEQ1, whose perceptions and experiences reflected a lack of understanding of program expectations, a sense of isolation individually and as an IEEQ cohort within the Faculty of Engineering, and burdens of heavy workload and financial cost. The nature of many of the supports were taken largely from the structure of the ENGAP program for aboriginal students in the Faculty of Engineering, University of Manitoba. A summary of current supports for IEEQ participants are summarized in Table 5.

The development of the supports for IEEQ participants is an example of an overall orientation toward a 'difference' rather than a 'deficit' model of qualifications recognition. The delivery of IEEQ is as much about identifying and facilitating the "Canadianization" of technical and professional knowledge, skills, and attitudes, as it is about addressing gaps or deficiencies in a IEG's background.

TABLE 5: SUPPORTS FOR IEEQ PARTICIPANTS

Academic Supports: to ease the transition back to university; to enhance perseverance and success in courses

- Referrals to campus services (English Language Centre, Learning Assistance Centre, etc.)
- An ESL / writing tutor within IEEQ program (as of IEEQ4)
- Cost of Schaum's Outline Series academic aids reimbursed to participants
- Encourage study groups within IEEQ; aim to schedule IEEQ students in courses with at least one other IEEQ student
- Alumni network with former IEEQ participants to talk about courses, get past notes, used textbooks, etc.

Financial Supports: to make the IEEQ program a realistic option for the participant & family

- Manitoba Labour & Immigration: tuition & textbook support to all participants
- Manitoba Advanced Education & Literacy: Professional Immigrant Pilot Program support to EI-eligible participants
- Referrals to Manitoba Student Loans
- Industry-sponsored bursaries: Manitoba Hydro – IEEQ bursary (2 x \$1500 annually); two other industry bursaries currently under development
- Emergency support (bus tickets, grocery vouchers) from IEEQ program

Social: to provide opportunities to build relationships within the group; provide opportunities to relate to program staff; provide wider networking opportunities within engineering industry

- IEEQ Orientation day in late August (separate from any other UofM orientation)
- Informal come-and-go IEEQ lunches (w/ staff) – two per term
- Social events with IEEQ families and staff: orientation day BBQ, December supper, May/June BBQ, fall graduation reception
- Industry tours: four per year, in diverse industry sectors
- Engineers-in-Residence are invited to most IEEQ social events, and are encouraged to become involved in informal mentoring relationships with IEEQ students.

Enhancing Information, Managing Expectations: Ongoing development and enhancement of program materials: brochures, application forms, student handbook (IEEQ policy guide), program material for employers, website, resource guide (information on ESL, employment, counselling, and childcare services)



Evaluation Purpose: Comparison of IEEQ Outcomes to IEEQ Objectives

The second goal of the assessment and evaluation activities is to provide a basis for comparison of participant outcomes to program objectives. The objectives of IEEQ, as conceptualized at program inception in 2003, were:

- To provide a *time-effective alternative* to the APEGM examination program;
- To provide a *supportive community* for immigrants as they work toward professional recognition, both with other immigrants pursuing similar goals and with Canadian engineers; and,
- To provide an opportunity for *progressive transition and integration* into the Canadian engineering profession over time, both in demonstration of technical background and in cultural and personal adjustments.

Since IEEQ (including these three objectives) was initially developed on very short timelines, an activity over the first year of the program was to contextualize IEEQ within a broader framework of IEG-related issues and goals. Between 2003 and 2005, the Canadian Council of Professional Engineers¹ and Statistics Canada⁷ published findings that resonated with common themes heard from local immigrant groups, local immigrant-serving agencies, and local engineering employers, namely that the two key integration challenges for IEGs are professional licensure and Canadian engineering work experience. Further, key determinants of labour market entry and success include English language skills and understanding of North American business and cultural norms.

Thus, IEEQ program objectives can be re-framed as follows:

- To deliver a program that facilitates *professional licensure* and *Canadian engineering work experience*, in which the program
 - Is a *time-effective alternative* to other licensing pathways;
 - Offers a *supportive community* for participants, both with other immigrants pursuing similar goals and with Canadian engineers; and,
 - Offers an opportunity for *progressive transition and integration* into the Canadian engineering profession, encompassing technical background, the culture of professional engineering in Canada, and English language skills.

The program structure is designed to facilitate these objectives. IEEQ is recognized by APEGM, on an annual basis, as an appropriate and complete substitute for a Confirmatory Exam program, and thus IEEQ facilitates professional licensure for successful participants. The co-op term within the program is a required element for successful completion and is facilitated almost entirely by the program staff, and thus IEEQ facilitates Canadian engineering work experience.

Focus group data from IEEQ participants support the perception that IEEQ is a time-effective alternative to a Confirmatory Exam program, and anecdotal observations of IEEQ and APEGM staff support this perception as well. However, to confirm this perception, more detailed data on IEG exam programs going back

five years have been requested from APEGM. These data are still pending at time of writing.

The social support structure for IEEQ participants (outlined previously) addresses the objective of providing a supportive community for IEEQ participants, although it remains an individual's decision whether to engage in and derive benefit from these supports. These supports were developed based on focus group feedback from the first cohort, IEEQ1, in response to the themes of isolation that were evident from that cohort. These themes were not evident in the focus group data from subsequent cohorts, IEEQ2 and IEEQ3, when asked to reflect on the weaknesses of the program and the challenges in participating. In contrast, subsequent cohorts identified support mechanisms within IEEQ (both independently and relative to Confirmatory Exam programs) as a program strength. Participants derived a sense of support both from the program structure (a cohort structure, and increasingly, connections to past cohorts) and interaction with Canadian engineers via program elements such as guest speakers, industry tours, and engineers-in-residence.

Similarly, focus group and follow-up questionnaire data indicate that participants perceive IEEQ as a vehicle to demonstrate and practice transition and integration into Canadian professional engineering, including technical, cultural, and language aspects. As detailed in earlier sections on findings, participants' retrospective perceptions of the program's value tended to focus to a greater degree on cultural integration, cultural understanding, and professional licensing aspects, than on academic gains.

Anecdotal and Other Validation of IEEQ

Other sources of information and feedback from participants (outlined in the section *Limitations on Scope*), and anecdotal comments from participants both during and after IEEQ further support the findings reported here. Additionally, anecdotal feedback from employers over the past three cohorts indicates that all IEEQ participants in co-op employment were able to perform at least as well as a Canadian graduate engineer. Approximately two-thirds of IEEQ participants in co-op employment were characterized as performing at an EIT level (regardless of how many years' experience the participant may have had from outside of Canada). This anecdotal feedback leads us to endorse the current structure which requires IEEQ 'graduates' to complete at least another eight months of acceptable engineering experience (post-IEEQ) before being eligible for the P.Eng. license. Employers' participation with IEEQ appears to be motivated primarily by a strong demand for engineering professionals and, to a lesser degree, a sense of corporate responsibility for some.

As part of the program's efforts to secure permanent funding from the Province of Manitoba, letters of support for IEEQ were received from APEGM, former IEEQ participants, Manitoba Hydro, the Consulting Engineers of Manitoba and member firms, the Canadian Manufacturers & Exporters and member firms, and Manitoba Aerospace and member firms. These letters are on file with IEEQ and are available for viewing, upon request.

In spring, IEEQ received the 2006 PEARL Award (Pursuit of Excellence in the Assessment & Recognition of Learning) from the Manitoba Prior Learning & Assessment Network (MPLAN). In fall, IEEQ received the 2006 Recognizing Learning Award in the Programs category from the Canadian Association for Prior Learning & Assessment (CAPLA).

In fall, 2005, the Canadian Council of Professional Engineers recognized the IEEQ Pilot Program as an effective program aligned with best practices in qualifications recognitions for IEGs. As an implementation-level initiative of CCPE's *From Consideration to Integration* project, CCPE entered into a contract with Human Resources and Social Development Canada (HRSDC, through the federal foreign credentials recognition (FCR) portfolio) to provide short-term support to the IEEQ Pilot Program in Manitoba, and furthermore, to derive a framework for an FCR program model for IEGs based on the IEEQ Pilot Program, which may be adopted in other Canadian jurisdictions. The University of Manitoba (via IEEQ) and APEGM are collaborating with CCPE to fulfill this mandate.

Acknowledgements and Contact Information

The IEEQ Pilot Program is delivered as a partnership between the Faculty of Engineering, University of Manitoba and the Association of Professional Engineers and Geoscientists of Manitoba, with financial support from the Province of Manitoba and the Government of Canada, through the Canadian Council of Professional Engineers.

This report has been prepared at the request of the Province of Manitoba and the Association of Professional Engineers and Geoscientists of Manitoba, and is intended for the exclusive use of these and the above-referenced stakeholders. Use of, or reliance on this report by other parties is neither anticipated nor authorized. Any questions and comments regarding this report may be directed to:

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Appendix A

Professional Engineering Employment Classification Rating Guide

Excerpted from the APEGM annual salary survey tools

A. DUTIES

This factor is concerned with the general nature of tasks assigned. The range is from duties performed in entrance-level jobs to those carried out at an advanced level.

Level 1: Receives training in various phases of office, plant, field, or laboratory engineering/geoscience work as classroom instruction or "on-the-job" assignments. May prepare plans, make calculations, and develop costs and bills of material in accordance with established codes, standards, drawings, or other specifications. May carry out routine technical surveys or inspections and prepare reports.

Level 2: This level is normally regarded as a continuing portion as professionals training and development. Receives assignments of limited scope and complexity, usually minor phases of broader assignments. Uses a variety of standard engineering/geoscience methods and techniques in solving problems. Assists more senior professionals in carrying out technical tasks requiring adherence to prescribed testing, analysis, design, or other methods.

Level 3: This is typically regarded as a fully qualified professional level. Carries out varied assignments requiring general familiarity with a broad field of engineering and knowledge of reciprocal effects of the work upon other fields. Solves problems by use of combinations of standard procedures, modifications of established techniques, or methods developed in previous assignments. Participates in planning to achieve prescribed objectives.

Level 4: This is the first level of direct and sustained supervision of other professionals. It is also the first level of full specialization. Requires application of mature professional knowledge in planning and conducting generally difficult or involved projects having scope for independent accomplishment. In solving problems, modifies established guides, devises new approaches, applies existing criteria in new ways, and draws conclusions from comparative situations.

Level 5: Participates in short-range and sometimes long-term planning. Makes independent decisions on work methods and procedures within an over-all program. Devises practical and economical solutions to problems. May supervise large groups containing both professional and non-professional staff. Or may exercise authority over a small group of highly qualified professional personnel engaged in complex technical applications. Or, as a specialist, may engage in research or other advanced technical studies calling for approaches that are ingenious, creative, and novel. Applies knowledge usually of more than one general field of engineering/geoscience or the specialized knowledge of a limited field or phase of engineering/geoscience.

Level 6: Normally directs an engineering/geoscience function involving several professional and other groups engaged in interrelated responsibilities. Or, as a specialist, has achieved recognition as an authority in an engineering/geoscience field of major importance to the organization. Conceives programs and problems to be investigated. Participates in discussions to determine basic operating policies, devises ways of reaching program objectives in the most economical manner, and meets unusual conditions affecting work progress.

Level 7: Directs the technical and administrative activities of a major division in a very large organization or all activities of a smaller organization. Determines policies, sees that projects and programs are carried to a conclusion, approves major expenditures of money, handles major contacts, and effects co-ordination on a broad scale. Or, as a senior specialist and widely recognized engineering/geoscience authority, conceives and carries out programs of great significance to the organization.

Level 8: Is accountable, as the chief executive of a very large organization, to a board of directors for the management of all technical and administrative activities to realize the objectives of the enterprise.

B. RECOMMENDATIONS, DECISIONS, AND COMMITMENTS

Select the level(s) that fits your job most appropriately.

Level 1: Makes technical decisions of a routine nature with ample precedent or clearly defined procedures as guides.

Level 2: Makes recommendations that are limited to problem solutions rather than end results. Makes decision that usually fall within established guidelines.

Level 3: Makes independent studies, analyses, and interpretations where technical subject matter, usually of limited scope, is involved. Normally refers difficult, complex, or unusual matters or decisions to more senior authority.

Level 4: Makes recommendations arising from work assignments that are reviewed for soundness of judgment but are usually accepted as technically accurate and feasible. Makes decisions on assignments in hand other than those having a major bearing on the course or cost of the work.

Level 5: Makes responsible decisions, not usually subject to technical review, on all matters assigned, subject to established operating policies and financial controls. Takes action to expedite the successful accomplishment of projects or programs assigned.

Level 6: Makes responsible technical and/or administrative decisions pertaining to functions assigned, including the expending of money and the implementation of major programs, subject only to over-all policies, budgets, and other financial controls. May participate in the formulation of corporate policies and long-term plans for the organization as a whole.

Level 7: Deals with major problems and makes the final technical and administrative policy decisions for a small or medium-sized organization. In a very

large organization, makes the principal technical and administrative decisions bearing upon the activities of a major decision. Work carries responsibility for actions taken, though these may be guided by policy of a board of directors or other superior authority.

Level 8: Isolates and analyzes major over-all problems and makes the associated final decisions for a very large organization. Requires sound, mature judgment to conceive and apply broad policies which may affect other companies in the area of operation or field of industry.

C. SUPERVISION RECEIVED

This factor is concerned with the degree to which independent action is required or permitted. This will be limited by the amount of direction received from superiors or provided through standard-practice instructions, policies, precedents, or practice. Select the level that fits your job most appropriately.

Level 1: Works under close supervision or completely detailed instructions. Work is reviewed for accuracy, adequacy, and conformance with prescribed procedures.

Level 2: Receives oral or written instructions as to methods and procedures to be followed in work assignments. Results are usually reviewed in detail and technical guidance is normally present to deal with problems and difficulties.

Level 3: Works under general supervision although amount of supervision received may vary with the assignment. Technical guidance is normally available to review work programs and advise on unusual features.

Level 4: Works in terms of specific objectives, relative priorities, and defined critical areas relating to work of other units. Makes decisions when general instructions, established methods, and clearly defined precedents indicate action to be taken, but refers unusual problems to supervisor.

Level 5: Works on programs or towards objectives to be accomplished. Results are reviewed for soundness of approach and general effectiveness. Makes decisions and takes action in the application of operating policies and of standards widely accepted within the profession.

Level 6: Works independently on broad, general assignments, with responsibility for the planning, direction, and conduct of all associated activities, limited only by policy and established financial controls. Takes action without reference to superiors, except where problems of policy change are involved.

Level 7: Operates as an executive at divisional level in a very large organization or as the chief executive in a smaller organization. Makes most technical and administrative decisions on his own rather than by reference to superiors.

Level 8: Determine the policies, plans, and programs through which the technical and administrative operations of a very large organization are directed and controlled, subject only to the approval of a board of directors.

D. LEADERSHIP AUTHORITY AND/OR SUPERVISION EXERCISED

This factor is concerned with the character of the supervisory responsibility. This may be direct (line) or indirect (staff). Select the level that fits your job most appropriately.

Level 1: Has no supervisory role.

Level 2: May assign and check work of one or two non-professional persons. Responsibility is limited to provision of occasional work direction.

Level 3: May give work direction to one or more technologists or helpers assigned to work on a short-term project, with no continuing supervisory responsibility.

Level 4: Usually responsible for the work of one or more full-time non-professional assistants. May give work direction to professionals of less standing assigned to work on a common project. Supervision of professionals is not usually a regular or continuing responsibility. May have a liaison responsibility with field crews on the interpretation of plans and specifications.

Level 5: Usually responsible for supervising the work of one or more junior professionals as well as other categories of staff. Assigns and outlines work; advises on technical problems; reviews work for accuracy and adequacy. Supervision may call for recommendations concerning selection, training, rating, and discipline of staff. May give technical direction to contractors employed on small projects and approve their finished work.

Level 6: Co-ordinates work programs and directs use of materials, equipment, and personnel, both professional and nonprofessional. Plans assignments, outlines methods of approach, and deals with difficult features. Normally makes recommendations on the selection, training, discipline, termination, and remuneration of staff. May give technical direction to contractors on major projects and approve their finished work. For staff positions, acts as advisor and assistant to the chief executive or in a very large organization, to an executive at divisional level.

Level 7: Supervises and directs the work of two or more major functions in an organization. Sets up standards of performance, co-ordinates operations, counsels assistants on unusual problems, evaluates performance, and sees that policies and programs are carried out. For staff positions, acts as advisor or consultant to the chief executive of a very large organization.

Level 8: Co-ordinates activities of the personnel in a major division in a very large organization or all personnel in a smaller organization. Develops long-term programs and objectives, shapes and interprets policy, and effects co-ordination on a broad scale.

Level 9: Functions as the chief executive officer of a very large organization, having final responsibility for direction of all personnel subject only to approvals of a board of directors. Effects co-ordination through contacts with senior executive officers who operate with a good measure of independence, through use of control devices of complex sorts, and through activities of personal staff assistants.

REPORT TO ARC FOR THE ARC 2007 REVIEW OF U. OF MANITOBA IEEQ PILOT PROGRAM

Submitted: 8th March 2007

Subcommittee Members: I Ferguson, ARC chair and IEEQ Liaison Committee chair
R. Menzies, ARC member and IEEQ Liaison Committee member
D. Polyzois, ARC member

SUMMARY

This document contains a report and recommendations from an ARC subcommittee on the University of Manitoba IEEQ pilot program. It is submitted to ARC for its 12th March 2007 meeting for the purpose of assisting ARC review the IEEQ program as was requested at the 13th March 2005 ARC meeting.

The review is based on the subcommittee members' observations on the progress of IEEQ participants as reported to ARC and the ARC Liaison Committee by the IEEQ Program Director, a review of the IEEQ program prepared for Manitoba Labour and Immigration and APEGM, a summary of the grades of IEEQ participants, and the answers to several questions provided by the IEEQ Program Director. On the basis of this information, the subcommittee concludes that the IEEQ program provides a satisfactory and efficient alternative to the confirmatory examination program for selected candidates. Evidence indicating that the IEEQ program is achieving its primary objective, which from the ARC perspective is the correct assessment of the academic backgrounds of confirmatory examination candidates, includes the collective view of the ARC committee members regarding the adequacy of the number, depth and breadth of the courses assigned in IEEQ programs; the grade distribution achieved by IEEQ participants; anecdotal evidence from employers of IEEQ participants comparing IEEQ graduates and Canadian engineering graduates; and the successful registration of IEEQ participants who have acquired sufficient work experience. Additional confidence in this interpretation could be obtained by the tracking of the IEEQ participants through the EIT process.

The subcommittee recommends to ARC that it approves the IEEQ program for the 2006-2007 year and that it express its appreciation to IEEQ program staff for their valuable contribution to the academic assessment process.

MOTIVATION

The 2007 ARC review of the IEEQ Pilot Program forms part of the ARC process of approving this program as an acceptable alternative to the confirmatory examination program for selected applicants for the purpose of achieving academic qualification. At the 13th September 2005 meeting the ARC decided that, as IEEQ was still a Pilot Program, it would like to review the program after the completion of the 2005/2006 year and make motions to accept IEEQ graduates on an annual basis. At the 9th January 2007 meeting a subcommittee consisting of I. Ferguson, R. Menzies, and D. Polyzois was formed and charged with making a recommendation to ARC at its 12th March 2007 meeting on the IEEQ program.

REVIEW MATERIALS

The conclusions of the subcommittee are based on large part on the observations its members have made on the progress of IEEQ participants as reported to ARC and the ARC Liaison Committee by the IEEQ Program Director, M. Friesen. These data are for IEEQ cohorts IEEQ1 through IEEQ4. The IEEQ Program Director, also provided the following material to be used in the review: an extensive review of the IEEQ program prepared for Manitoba Labour and Immigration and APEGM (IEEQ 2007); materials submitted by the one IEEQ3 participant satisfying the requirements for 98-CS-4; and a summary of the grades of all IEEQ participants. In addition IEEQ staff were available to answer any questions occurring during the review.

DEMOGRAPHICS OF IEEQ PARTICIPANTS AND ROLE OF CONFIRMATORY EXAMINATIONS

The entrance criteria for the IEEQ program include a consideration of the number of examinations assigned to the candidates by ARC. The points assigned for this aspect (and for the number of years since graduation) are:

Confirmatory Exams		Years since Graduation	
5	10 points	=or > 7 years	6 points
4	8 points	4-6 years	4 points
3	6 points	0-3 years	2 points
2	4 points		
1	2 points		

A review of the IEEQ participants from IEEQ1 to IEEQ4 indicates 1 applicant with six examinations, 10 applicants with 5 exams, 11 applicants with 4 exams, 14 applicants with 3 exams, and 3 applicants with 2 exams (Figure 1). The mean number of exams is 3.80.

With this entrance system in place IEEQ participants will most likely have either narrow degrees from CCPE-listed universities or else come from non-listed universities. List confirmatory programs would normally consist of two examinations from Group A and one examination from Group B of the appropriate discipline syllabus/syllabi, and one Complementary Studies Examination with additional examinations assigned if the candidates' backgrounds do not cover appropriate breadth. Non-list confirmatory examinations will usually consist of three examinations from Group A and two examinations from Group B of the appropriate discipline syllabus/syllabi and one Complementary Studies Examination but this number will be reduced slightly in the case of degrees with good depth and breadth. To the extent that the IEEQ program substitutes for the confirmatory examination program its function will include both the aspect of confirmation of the background of its participants and the filling of gaps existing in narrow programs.

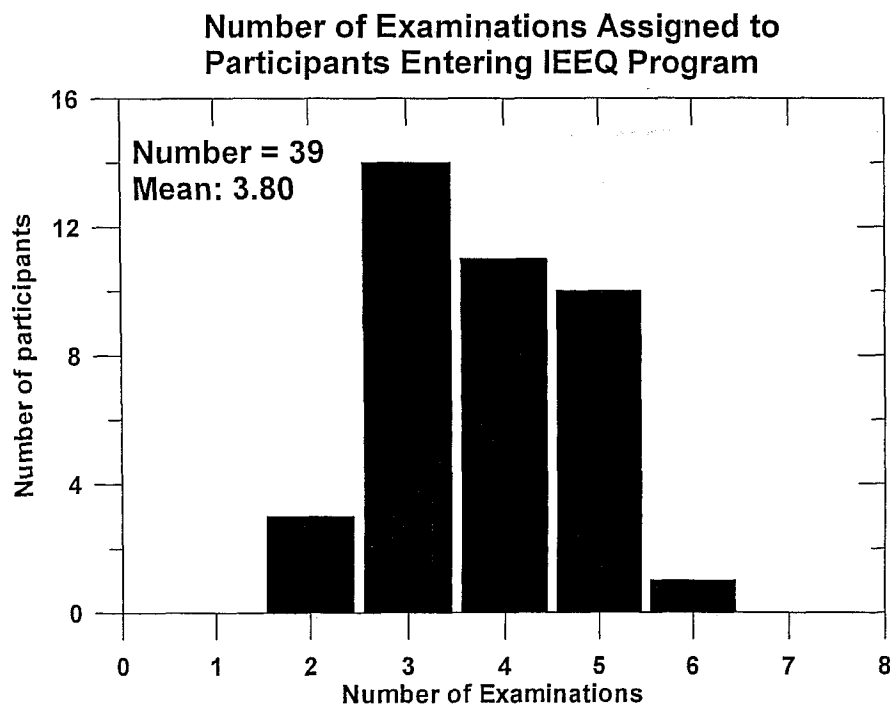


Figure 1. Number of examinations assigned by ARC to participants accepted into IEEQ1 to IEEQ4. Note that in some cases the number of examinations was reduced by the time the participants completed their IEEQ program as a result of them providing additional information to ARC.

ACADEMIC ASSESSMENT BY IEEQ

Although the IEEQ program provides other functions, e.g. providing North American work experience for internationally trained engineers, its fundamental function from the ARC perspective is to serve as an alternative to a confirmatory examination program. The most important function of the present review is therefore to assess whether the program is serving this role. Measures available for this assessment are the performance of IEEQ participants in work placements after their graduation and during their co-op terms and the general performance of participants in their IEEQ course-work.

IEEQ (2007) provides some evidence pertaining to the work-place aspect.

(a) It is reported in IEEQ (2007) that anecdotal evidence from co-op supervisors indicates that all participants performed at the level of at least a Canadian graduate and that approximately two-thirds are of the view that the IEEQ co-op participants function at EIT level or above.

(b) Evidence is also provided by the APEGM registration process. IEEQ (2007) reports that the several IEEQ participants who have acquired sufficient work experience have successfully registered as professional engineers. This outcome and the absence of any problems brought to the attention of the ARC by APEGM and/or the ERC as a result of the EIT tracking process suggests that the IEEQ graduates enter the workplace with comparable backgrounds to Canadian graduates.

In terms of the course-work aspect it appears from the summary of grades that the IEEQ program is providing a good level of assessment of the academic backgrounds of the participants.

(a) Part of the function of the confirmatory examination process is to identify those applicants whose background is inadequate relative to Canadian engineering graduates. Some applicants assigned confirmatory examinations by ARC fail one or more examinations and are re-assigned to a proficiency program. This process does not represent a failure of the ARC procedure but rather the correct operation of assessment process. There have been several IEEQ applicants who have not completed that program due to academic difficulties. This outcome suggests that the IEEQ program is at least to some extent identifying those candidates who may not have been able to complete the confirmatory examination process. It is not possible to state conclusively that those applicants who did not complete the IEEQ program would also have failed confirmatory examinations. However, the number of participants failing to complete the IEEQ program seems to be at about the same statistical level as the numbers of candidates who fail in the confirmatory examination program. The absence of any failures in a combined group of around 40 IEEQ participants would have raised some concern that the program was not adequately identifying such candidates.

(b) Several IEEQ participants have received excellent grades throughout their programs. This observation is in accord with a number of confirmatory examination candidates who do very well in their examination program. Considering that the courses taken by the IEEQ participants include specialized fourth year courses it is most likely these participants have solid academic credentials and that the IEEQ program is thus providing a good assessment of their academic background.

(c) Some IEEQ participants have received poor grades. Ideally a passing performance in IEEQ would correspond to a passing performance on a confirmatory examination program. It is very difficult to make a direct comparison of these two levels but considering the uncertainty that exists in the manner that either method assesses an academic background the IEEQ program seems to be set to an appropriate level. The performance of IEEQ participants in particular types of courses is examined below.

The IEEQ program provides a thorough testing of participants. The participants are typically assigned two core courses (Engineering Economics plus Practice of Professional Engineering in Manitoba), and two to six technical courses (with the number of courses usually equal to the number of assigned examinations plus one), a co-op term, and a co-op term report. Thus a participant assigned three examinations will typically take 5 or 6 courses and one assigned five exams will typically take up to 8 courses. This number of courses should be adequate to identify those participants with inadequate academic backgrounds. It is of note that the IEEQ participants are assessed using Canadian university engineering courses and that these are the same courses that form the Canadian engineering degree, the ultimate standard against which the applicants are being assessed.

(d) It is possible that the IEEQ process could incorrectly identify an academically qualified person as not being qualified. This possibility is presently minimized by allowing for a number of failed courses within the IEEQ program and by the IEEQ program staff providing various forms of support for the participants.

There is presently no precise means of assessing how accurately the IEEQ program is achieving its objective of assessing academic credentials. The present review is based on the collective view of the ARC members rather than an exact metric and the review described in IEEQ (2007) focuses more on aspects such as time effectiveness of the assessment approach and the level of support provided and it is based on an evaluation of the program by IEEQ participants and anecdotal evidence from employers. The tracking of IEEQ graduates through the EIT process thus forms an important part of the process of assessing the IEEQ program. If it is necessary to increase the confidence that the IEEQ program is appropriately matched to the confirmatory examination program it may be appropriate for APEGM, the Registration Committee (RC), or the Experience Review Committee (ERC) to conduct an experience-based comparison of IEEQ graduates with Canadian graduates.

FILLING OF PROGRAM GAPS BY IEEQ

The IEEQ program provides a good mechanism for its participants to fill educational gaps resulting from very narrow engineering degrees. In the assignment of courses to participants there is at least one course assigned for each technical examination assigned and two courses for one of the examinations. Although in the list of Examination Course Equivalents maintained by APEGM there may be two or three courses corresponding to each examination, the IEEQ program assures that each area assigned an examination is covered by at least one course.

EFFECTIVENESS OF IEEQ FOR DIFFERENT CATEGORIES OF EXAMINATIONS

In this section the effectiveness of the IEEQ program in the different areas of the examination program is assessed.

(a) **Basic Studies Examinations** A number of participants in the IEEQ program have been assigned basic studies examinations, most notably 98-BS-2 Probability and Statistics and 98-BS-5 Advanced Mathematics. As shown in figure 2 the results in the corresponding courses (e.g. STAT 2200 and MATH 3100) have ranged from very good to failure with a mean grade point result of 2.72 (midway between C+ and B). The results suggest the process is forming a good assessment of the academic background of applicants in this type of examination.

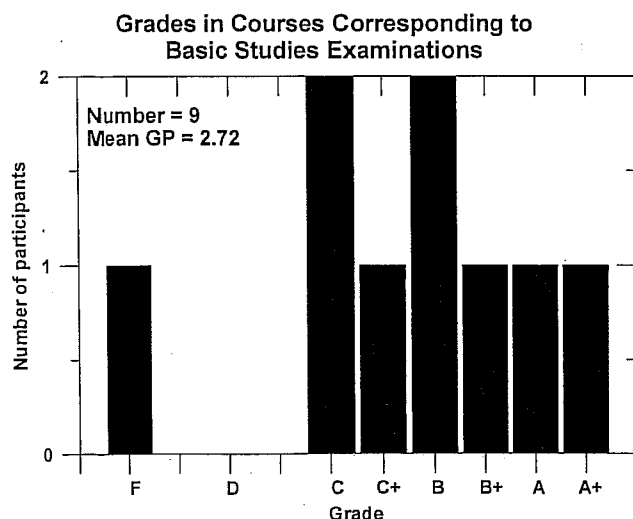


Figure 2. Results from IEEQ1-IEEQ4 participants in courses corresponding to Basic Studies examinations.

(b) Group A and Group B Examinations In the IEEQ program the Group A and B examinations are usually matched to third or fourth year engineering courses. Participants have achieved a range of grades suggesting the courses provide a good evaluation of the corresponding examination areas. The mean result is approximately a B+ (Figure 3). This result is likely higher than that for regular undergraduate students taking these courses reflecting the fact that for some IEEQ participants the course is confirming existing knowledge. Note that in cases in which participants have been assigned both Group A and Group B examinations by ARC, if a choice has to be made, IEEQ staff endeavor to ensure that it is the Group B examinations that are covered more comprehensively (i.e. the examination for which there are two courses assigned is a Group B examination). However, other factors such as course availability and scheduling, and for some participants, the constraints associated with satisfying 98-CS-4 requirements mean that such a choice is not always possible.

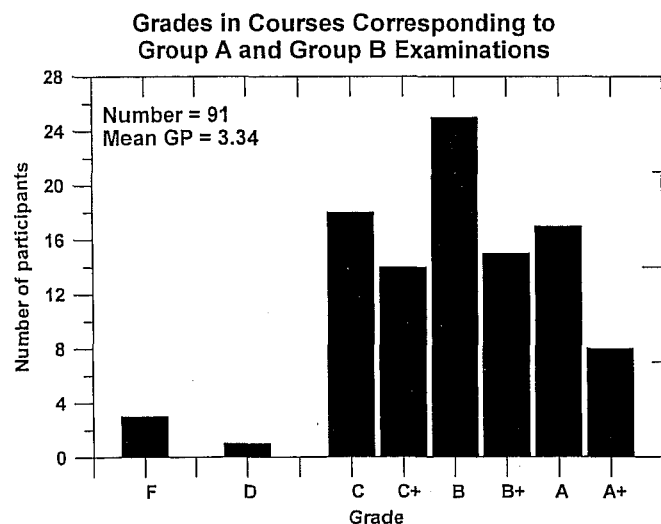


Figure 3. Results from IEEQ1-IEEQ4 participants in courses corresponding to Group A and Group B examinations.

(c) Complementary Studies Examinations: 98-CS-1 Engineering Economics This is a core course in the IEEQ program. Results in the course range from A+ and D with numerous grades in the B to B+ range. The mean result is close to a B. This examination is assigned to a large number of the ARC applicants and the results suggest that it is a useful core course in the IEEQ program.

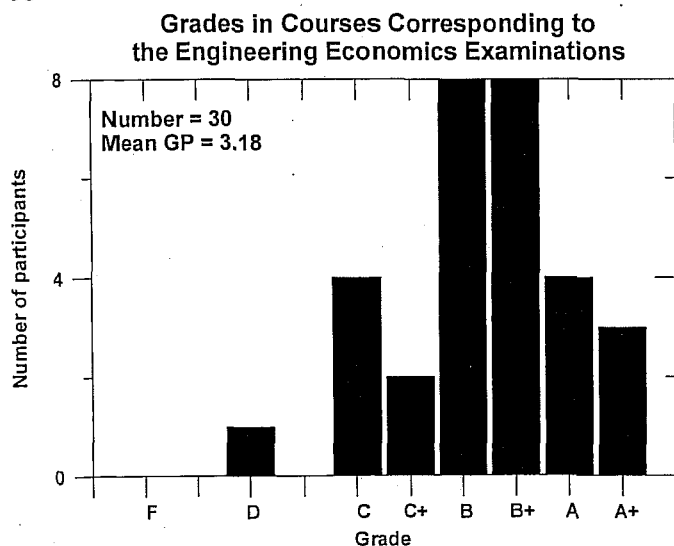


Figure 4. Results from IEEQ1-IEEQ4 participants in courses corresponding to the 98-CS-1 Engineering Economics examination.

(d) Complementary Studies Examinations: 98-CS-3 Management Concepts for Engineers. Ten IEEQ participants have taken courses corresponding to an assigned 98-CS-3 examination and the average grade is in the C+ to B range. Although the numbers form only a small sample, the results appear similar to those for 98-CS-1.

(e) Complementary Studies Examinations: 98-CS-4 Engineering Report An earlier subcommittee of ARC that reviewed co-op reports from the first IEEQ cohort expressed some concern at the level of reports being used to satisfy the 98-CS-4 requirement. This led to a revision of IEEQ regulations in which participants who had been assigned the report were required to complete an additional design course with a report component and an extended co-op report. Examination by the present subcommittee of the material provided by the one IEEQ3 participant who was assigned 98-CS-4 suggests the present configuration, while a reasonable solution for the pilot level program, is not ideal. The co-op reports provided do not necessarily document the actual engineering problem addressed in the work term, nor do they contain sufficient analysis and design, with proper bibliographies. The design course submissions do not necessarily document the contribution of the participant within group projects. In a possible future expansion of the IEEQ program the funding arrangements may enable University of Manitoba faculty members to be assigned to teach capstone design courses that enable IEEQ participants to completely satisfy their 98-CS-4 requirements. This would provide a satisfactory solution to the present situation.

EFFICIENCY OF THE IEEQ PROGRAM FROM ARC PERSPECTIVE

From the perspective of ARC, the IEEQ program now provides a relatively efficient means of assessing academic credentials. The total amount of committee-member time spent per student is comparable, on average, to that spent dealing with confirmatory program applicants outside the IEEQ program. It is of note that in the first few years of the program ARC was spending a much, much greater time per IEEQ participant, mostly because of the developmental nature of the program at that time. The establishment of the IEEQ Liaison Committee has also significantly reduced the total number of hours spent per IEEQ participant by individual committee members.

RECOMMENDATIONS (SHORTER TERM)

The subcommittee recommends the following two motions be considered by ARC:

- (a)** That based on a review of the IEEQ1-4 participants' academic results, anecdotal evidence from IEEQ co-op term employers reported in IEEQ (2007), and the successful registration of the several graduates who have acquired sufficient work experience, the IEEQ program offers a satisfactory and efficient alternative to the confirmatory examination program. The ARC expresses its appreciation to the IEEQ program staff for their valuable contribution to the ARC academic assessment process.
- (b)** That for approved applicants, the 2007-2008 University of Manitoba IEEQ program is an acceptable alternative to the confirmatory examination program for the purpose of achieving academic qualification. Successful completion of the IEEQ program by a participant, as confirmed by a letter from the Dean of Engineering, will be deemed by ARC as equivalent to completion of their assigned confirmatory examination program. Final approval of IEEQ participants as being academically qualified for registration will be made by ARC committee following their successful completion of the program.

CONSIDERATIONS (LONGER TERM)

IEEQ is presently awaiting word on whether provincial funding will be forthcoming to allow the expansion of the program beyond the pilot form. Should an expansion of the IEEQ program occur it would become appropriate for ARC to consider several aspects related to IEEQ in more detail. In particular:

- (a)** It may be appropriate for ARC to consider a motion recommending that an experience-based review of the IEEQ graduates be conducted by APEGM, ARC, or ERC based on their performance during the EIT process.

(b) IEEQ should expect to have a number of participants failing to complete the program even when it is functioning correctly. It would be useful to revisit both ARC and IEEQ regulations pertaining to these situations. In particular, the process should be designed to ensure participants are not subject to an undue number of unnecessary courses, examinations, and financial cost.

(c) It will be necessary to review the entrance scheme for the IEEQ program. For example, it may be appropriate to allow candidates assigned more than five confirmatory examinations to complete the last part of their examination program through IEEQ.

(d) It may be necessary to define explicit IEEQ regulations for cases in which candidates are appealing a component of the ARC assessment at the same as they apply to enter the IEEQ program.

(e) It would be useful to re-examine the interaction of ARC, the IEEQ program, and the IEEQ Liaison Committee and the present ARC system of annual approval of the program.

REFERENCES

IEEQ 2007. Outcomes, Perceptions, and Experiences of IEEQ Participants, 2003-2006. Report submitted to Manitoba Labour & Immigration and APEGM, January 2007, 23 pp.

Report of the Senate Planning and Priorities Committee on the Proposal for a Post-Baccalaureate Diploma for the Internationally-Educated Engineers Qualification Program (IEEQ) in the Faculty of Engineering

Preamble:

1. The terms of reference of the Senate Planning and Priorities Committee (SPPC) are found on the website at:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/508.htm, wherein SPPC is charged with making recommendations to Senate regarding proposed academic programs.
2. The Faculty Council of Engineering has approved the Proposal for a Post-Baccalaureate Diploma for the Internationally-Educated Engineers Qualification Program (IEEQ).
3. The Faculty Council of Engineering recommends that Senate approve the Proposal for a Post-Baccalaureate Diploma for the Internationally-Educated Engineers Qualification Program (IEEQ)

Observations:

1. This proposed IEEQ Program has been developed to serve the needs of immigrants whose professional education does not meet the requirements for registration as a Professional Engineer in Canada and to address a shortage of professionally trained engineers in the Province of Manitoba. The IEEQ Program provides an educational resource to ensure quality professional practice and to expedite the credentialing process for internationally-educated engineers. It has been designed to provide an effective means to assist engineers whose training was taken in countries other than Canada to meet licensing requirements of the Association of Professional Engineers and Geoscientists of Manitoba (APEGM), the licensing body for engineers in Manitoba. The proposed program will formalize and simultaneously expand a very effective pilot project conducted by the Faculty of Engineering in collaboration with the APEGM to meet the needs of increasing numbers of immigrants to Manitoba.
2. The committee noted that the Program will require a significant addition of new funds to fully implement the proposed program. This would include 7 FTE Program staff (1 Academic Coordinator and 6 academic staff) and 1 FTE administrative/support staff as well \$200,000 in material and supply costs. In short, IEEQ program requires baseline funding (for academic and support staff and other operating costs) of \$1,039,000 annually once the program has achieved a steady state. The committee also noted that proposal documentation indicated that COPSE has, via letter to the President, committed to funding this program once it is approved and implemented.
3. The committee observed that the proposed new IEEQ Program would require no additional space. It will be accommodated using existing infrastructure and space.

4. The committee noted that the proposal provided documentation which indicated that the University of Manitoba Libraries has reviewed the library resource needs for the proposed program. The Director of Libraries' report indicated that there are no library implications regarding the Program since the Engineers in Residence hired for this Program will teach engineering courses that exist already. The students in this program will be using existing resources in place for the undergraduate and graduate engineering programs.

Recommendations:

SPPC recommends THAT: Senate approve and recommend to the Board of Governors that it approve the introduction of a Post-Baccalaureate Diploma for the Internationally-Educated Engineers Qualification Program (IEEQ). The Senate Committee on Planning and Priorities recommends that the Vice-President (Academic) not implement the program until he is satisfied that there would be sufficient space and new funding to support the ongoing operation of the program.

Respectfully submitted,

Norman Hunter, Chair
Senate Planning and Priorities Committee

Report of the Senate Committee on Course and Curriculum Changes Part B – Changes in Excess of Nine Credit Hours - Submitted to Senate for Ordinary Debate

RE: Faculty of Engineering, Department of Mechanical and Manufacturing Engineering

Preamble:

1. The terms of reference for the Senate Committee on Curriculum and Course Changes (SCCCC) are found on the website at:
http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/497.htm. SCCCC is "to recommend to Senate on the introduction, modification or abolition of undergraduate programs, curricula or courses".
2. This part of the report contains observations and recommendations on course change proposals for units where the net increase is more than nine credit hours. The Senate Planning and Priorities Committee was provided with copies of these proposals as well.
3. The Department of Mechanical and Manufacturing Engineering, Faculty of Engineering, submitted a proposal for a curriculum change with a net change in credit hours in excess of nine.

Observations:

1. The Department is proposing a major change to both the Manufacturing Engineering and Mechanical Engineering Programs.
2. The proposal includes the termination of the Manufacturing Engineering program which will subsequently be offered as an option within the Mechanical Engineering program. There will be no intake into the Manufacturing program starting September 2009.
3. The Department will continue to offer the degree program in Mechanical Engineering with an option in Aerospace Engineering; in addition, a new option in Manufacturing Engineering will be available to students. Students may also select a stream in Thermo-fluids, Solid Mechanics, Materials or choose a broad selection of courses (non-specialty) to fulfill the technical elective requirement.
4. The Committee noted that a number of the courses were due to be deleted as 3 credit hour courses and subsequently introduced as 4 credit hour courses; this puts the courses in line with other courses in the Faculty of Engineering where courses with laboratories are assigned 4 credit hours.
5. The new curriculum will require four fewer courses for graduation reducing the credit hour requirement to 156-158 credit hours from the 161-165 credit hours currently required.
6. The current curriculum allows little flexibility in course selection and choice of specialization. The new curriculum will provide greater course selection and flexibility to the students.

Comments of the Senate Executive Committee:

The Senate Executive Committee endorses
the report to Senate.

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7. Courses that are part of the current curriculum will be phased out over the next three years in order to allow students to complete their degree based on the current curriculum. The Manufacturing program will be phased out when the last students graduate; this anticipated to be within two years (September 2011).

Recommendation

The Senate Committee on Curriculum and Course Changes recommends:

THAT Senate approve the curriculum and course changes from the Department of Mechanical and Manufacturing Engineering, Faculty of Engineering.

Respectfully submitted,
Professor H. Frankel, Acting-Chair
Senate Committee on Curriculum and Course Changes

/mb

Faculty of Engineering

Department of Mechanical and Manufacturing Engineering

Table I: Current General Mechanical Engineering Program

Preliminary Engineering Program - 12 courses:

CHEM 1300 Structure and Modelling in Chemistry
 COMP 1010 Introduction to Computer Science
 ENG 1430 Design in Engineering
 ENG 1440 Introduction to Statics
 ENG 1450 Introduction to Electrical and Computer Engineering
 ENG 1460 Introduction to Thermal Science
 ENGL 1310 Literary Topics 1
 MATH 1210 Techniques of Classical and Linear Algebra
 MATH 1510 Applied Calculus 1
 MATH 1710 Applied Calculus 2
 PHIL 1290 Critical Thinking 1
 PHYS 1050 Physics 1: Mechanics

Departmental Program: Year 2 – 14 courses

CHEM 2240 Applied Chemistry for Engineers
 MATH 2130 Engineering Mathematical Analysis 1
 MECH 2012 Computer Aided Design and Manufacturing Processes¹
 MECH 2120 Mechanics of Machines
 MECH 2202 Thermodynamics²
 MECH 2222 Mechanics of Materials²
 MECH 2290 Manufacturing Engineering

 PHYS 1070 Physics 2
 STAT 2220 Contemporary Statistics for Engineers
 MATH 2132 Engineering Mathematical Analysis 2
 MATH 2120 Introductory Numerical Methods for Engineers
 MECH 2262 Fundamentals of Fluid Mechanics³
 MECH 2270 Principles of Engineering Materials
 MECH 2300 Introduction to Production and Manufacturing

Departmental Program: Year 3 – 11 courses

MATH 3132 Engineering Mathematical Analysis 3
 MECH 3480 Dynamics
 MECH 3492 Fluid Mechanics and Applications²
 MECH 3502 Stress Analysis & Design²
 MECH 3540 Modern Engineering Materials
 Complementary Studies Elective

 MECH 3420 Vibrations & Acoustics
 MECH 3430 Measurements & Control
 MECH 3460 Heat Transfer
 ENG 2010 Technical Communications
 Technical Elective I

Departmental Program: Year 4 – 12 courses

ELEC 3680 or ELEC 3720
 MECH 4160 Thesis
 MECH 4650 Machine Design 4M
 MECH 4820 Computational Methods for Thermo fluids
 MECH 4860 Engineering Design
 MECH 4980 Mechanical Engineering Laboratory 1
 Technical Elective II

 CIVL 4050 Engineering Economics
 MECH 4160 Thesis
 MECH 4680 Energy Conservation and Utilization
 MECH 4990 Mechanical Engineering Laboratory 2
 ANTH2430 Ecology, Technology and Society
 Technical Elective III

¹ Proposed new courses 2009/2010

² Revised Course content 2009/2010

³ Credit hour change to 4 credit hours 2009/2010

Table II: Current Mechanical Engineering Program: Aerospace Option

Preliminary Engineering Program - 12 courses:

CHEM 1300 Structure and Modelling in Chemistry
COMP 1010 Introduction to Computer Science
ENG 1430 Design in Engineering
ENG 1440 Introduction to Statics
ENG 1450 Introduction to Electrical and Computer Engineering
ENG 1460 Introduction to Thermal Science
ENGL 1310 Literary Topics 1
MATH 1210 Techniques of Classical and Linear Algebra
MATH 1510 Applied Calculus 1
MATH 1710 Applied Calculus 2
PHIL 1290 Critical Thinking 1
PHYS 1050 Physics 1: Mechanics

Departmental Program: Year 2 – 14 courses

CHEM 2240 Applied Chemistry for Engineers
MATH 2130 Engineering Mathematical Analysis 1
MECH 2012 Computer Aided Design and Manufacturing Processes¹
MECH 2120 Mechanics of Machines
MECH 2202 Thermodynamics²
MECH 2222 Mechanics of Materials¹
MECH 2290 Manufacturing Engineering

PHYS 1070 Physics 2
STAT 2220 Contemporary Statistics for Engineers
MATH 2132 Engineering Mathematical Analysis 2
MATH 2120 Introductory Numerical Methods for Engineers
MECH 2262 Fundamentals of Fluid Mechanics³
MECH 2270 Principles of Engineering Materials
MECH 2300 Introduction to Production and Manufacturing

Departmental Program: Year 3 – 11 courses

MATH 3132 Engineering Mathematical Analysis 3
MECH 3480 Dynamics
MECH 3492 Fluid Mechanics and Applications²
MECH 3502 Stress Analysis & Design²
MECH 3540 Modern Engineering Materials
MECH 4170 Program Management and Systems Eng

MECH 3420 Vibrations & Acoustics
MECH 3430 Measurements & Control
MECH 3460 Heat Transfer
MECH 3520 Aerodynamics
MECH 4192 Aerospace Materials and Manufacturing Processes³

Departmental Program: Year 4 – 12 courses

MECH 4160 Thesis
MECH 4200 Gas Turbine Propulsion Systems
MECH 4452 Aircraft Performance, Dynamics and Design³
MECH 4860 Engineering Design
MECH 4980 Mechanical Engineering Laboratory 1
ENG 2010 Technical Communications
Complementary Studies

CIVL 4050 Engineering Economics
MECH 4160 Thesis
MECH 4182 Aerospace Structures: Analysis and Design³
MECH 4990 Mechanical Engineering Laboratory 2
CIVL 4460 or ANTH2430
Technical Elective

Table III: Current Manufacturing Engineering Program

Preliminary Engineering Program - 12 courses:

CHEM 1300 Structure and Modelling in Chemistry
COMP 1010 Introduction to Computer Science
ENG 1430 Design in Engineering
ENG 1440 Introduction to Statics
ENG 1450 Introduction to Electrical and Computer Engineering
ENG 1460 Introduction to Thermal Science
ENGL 1310 Literary Topics 1
MATH 1210 Techniques of Classical and Linear Algebra
MATH 1510 Applied Calculus 1
MATH 1710 Applied Calculus 2
PHIL 1290 Critical Thinking 1
PHYS 1050 Physics 1: Mechanics

Departmental Program: Year 2 – 14 courses

CHEM 2240 Applied Chemistry for Engineers
MATH 2130 Engineering Mathematical Analysis 1
MECH 2012 Computer Aided Design and Manufacturing Processes¹
MECH 2120 Mechanics of Machines
MECH 2202 Thermodynamics²
MECH 2222 Mechanics of Materials¹
MECH 2290 Manufacturing Engineering

PHYS 1070 Physics 2
STAT 2220 Contemporary Statistics for Engineers
MATH 2132 Engineering Mathematical Analysis 2
MATH 2120 Introductory Numerical Methods for Engineers
MECH 2262 Fundamentals of Fluid Mechanics³
MECH 2270 Principles of Engineering Materials
MECH 2300 Introduction to Production and Manufacturing

Departmental Program: Year 3 – 12 courses

MATH 3132 Engineering Mathematical Analysis 3
MECH 3480 Dynamics
MECH 3502 Stress Analysis and Design
MECH 3540 Modern Engineering Materials
MECH 3552 Robotics and Computer Numerical Control
MECH 3560 Modeling & Analysis of Manufacturing Systems

MECH 3420 Vibrations & Acoustics
MECH 3430 Measurements & Control
MECH 3570 Manufacturing Automation
MECH 3580 Production Planning & Control
MECH 3590 Systems Simulation and Facilities Planning
Complementary Studies

Departmental Program: Year 4 – 12 courses

ECE3680 or ECE3720
MECH 4650 Machine Design 4M
MECH 4860 Engineering Design
MECH 4900 Mechatronics System Design
MECH 4960 Manufacturing Process 1
ENG 2010 Technical Communications

CIVL 4050 Engineering Economics
MECH 4160 Thesis or Technical Elective III
MECH 4680 Energy Conservation and Utilization
MECH 4970 Manufacturing Process 2
ANTH2430
Technical Elective I
Technical Elective

Table IV: Proposed Mechanical Engineering Program

Preliminary Engineering Program – 12 courses:

CHEM 1300 Structure and Modelling in Chemistry
COMP 1010 Introduction to Computer Science
ENG 1430 Design in Engineering
ENG 1440 Introduction to Statics
ENG 1450 Introduction to Electrical and Computer Engineering
ENG 1460 Introduction to Thermal Science
ENGL 1310 Literary Topics 1
MATH 1210 Techniques of Classical and Linear Algebra
MATH 1510 Applied Calculus 1
MATH 1710 Applied Calculus 2
PHIL 1290 Critical Thinking 1
PHYS 1050 Physics 1: Mechanics

Departmental Program: Year 2 – 12 courses

CHEM 2240 Applied Chemistry for Engineers
MATH 2130 Engineering Mathematical Analysis 1
MECH 2012 Computer Aided Design and Manufacturing Processes¹
MECH 2202 Thermodynamics²
MECH 2222 Mechanics of Materials¹
ENG 2010 Technical Communications

STAT 2220 Contemporary Statistics for Engineers
MATH 2132 Engineering Mathematical Analysis 2
MATH 2120 Introductory Numerical Methods for Engineers
MECH 2262 Fundamentals of Fluid Mechanics³
MECH 2272 Engineering Materials I¹
Complementary Studies Elective

Departmental Program: Year 3 – 11 courses

MATH 3132 Engineering Mathematical Analysis 3
MECH 3482 Kinematics and Dynamics¹
MECH 3492 Fluid Mechanics and Applications²
MECH 3502 Stress Analysis and Design²
MECH 3542 Engineering Materials 2¹

MECH 3420 Vibrations and Acoustics
MECH 3430 Measurement and Control
MECH 3460 Heat Transfer
MECH 3170 Project Management⁷
Technical Elective I
MECH 3FFF Mechanical Engineering Laboratory Course both terms⁷

Departmental Program: Year 4 – 11 courses

MECH 4650 Machine Design 4M
MECH 4860 Engineering Design
CIVL 4050 Engineering Economics
Technical Elective II
Technical Elective III

ELEC 4AAA Electrical Engineering
ANTH 2430 Ecology, Technology and Society
PHYS 1070 Physics 2: Waves and Modern Physics
Technical Elective IV
Technical Elective V

Table V: Mechanical Courses Introduced Effective September 2009

Aerospace Option

Choose all 5 courses.

1. MECH 3520 Aerodynamics
2. MECH 4182 Aerospace Structures: Analysis and Design
3. MECH 4192 Aerospace Materials and Manufacturing Processes
4. MECH 4200 Gas Turbine Propulsion Systems
5. MECH 4452 Aircraft Performance, Dynamics and Design

Manufacturing Option

Choose 5 of 10 courses. Some courses will be offered in alternating years.

1. MECH 3550 Robotics and Computer Numerical Control
2. MECH 3562 Modeling and Analysis of Manufacturing Systems
3. MECH 3570 Manufacturing Automation
4. MECH 3582 Manufacturing Planning and Quality Control
5. MECH 3592 Simulation Modeling and Facilities Planning
6. MECH 3900 Mechatronics Systems Design
7. MECH 4960 Manufacturing Processes 1
8. MECH 4970 Manufacturing Processes 2
9. MECH 4340 Contemporary Topics in Manufacturing Engineering I
10. MECH 4342 Contemporary Topics in Manufacturing Engineering II

Materials Stream

Choose three from the following five technical electives. Choose the remaining two TEs from the same stream, other technical electives or thesis. Some courses will be offered in alternating years.

1. MECH 4620 Corrosion of Metals and Alloys
2. MECH 4870 Fracture and Failure of Engineering Materials
3. MECH 4192 Aerospace Materials and Manufacturing Processes
4. MECH 4350 Topics in Materials 1
5. MECH 4360 Topics in Materials 2

Solid Mechanics Stream

Choose three from the following six technical electives. Choose the remaining two TEs from the same stream, other technical electives or thesis. Some courses will be offered in alternating years.

1. MECH 4532 Advanced Strength of Materials
2. MECH 4550 Noise Control
3. MECH 4672 Applied Mechanical Design
4. MECH 4510 Fundamentals of Finite Element Analysis
5. MECH 4182 Aerospace Structures: Analysis and Design
6. MECH 4470 Mechanical Vibration

Thermofluids Stream

Choose three from the following nine technical electives. Choose the remaining two TEs from the same stream, other technical electives or thesis. Some courses will be offered in alternating years.

1. MECH 4292 IC Engines
 2. MECH 4412 Heating, Venting and Air Conditioning
 3. MECH 4822 Numerical Heat Transfer in Fluid Flow
 4. MECH 4560 Selected Topics in Fluid Mechanics 4M
 5. MECH 4680 Energy Conversion Utilization
 6. MECH 4692 Renewable Energy
 7. MECH 4694 Advanced Topics in Heat Transfer
 8. MECH 4702 Design of Thermal Systems
 9. MECH 4822 Numerical Heat Transfer in Fluid Flow
-

Table VI: Mechanical Courses Introduced Effective September 2009

Course #Course Title	Credit Hours	Introduced
MECH 2012 Computer Aided Design and Manufacturing Processes	4	Effective Sept 2009
MECH 2202 Thermodynamics	4	Effective Sept 2009
MECH 2222 Mechanics of Materials	4	Effective Sept 2009
MECH 2262 Fundamentals of Fluid Mechanics	4	Effective Sept 2009
MECH 2272 Engineering Materials 1	4	Effective Sept 2009
MECH 3170 Project Management	4	Effective Sept 2009
MECH 3482 Kinematics and Dynamics	4	Effective Sept 2009
MECH 3492 Fluid Mechanics and Applications	4	Effective Sept 2009
MECH 3502 Stress Analysis and Design	4	Effective Sept 2009
MECH 3542 Engineering Materials 2	4	Effective Sept 2009
MECH 3562 Introduction to Optimization	4	Effective Sept 2009
MECH 3582 Manufacturing Planning and Quality Control	4	Effective Sept 2009
MECH 3592 Simulation Modeling and Facility Planning	4	Effective Sept 2009
MECH 3980 Mechanical Engineering Laboratory	4	Effective Sept 2009
MECH 4162 Thesis	6	Effective Sept 2009
MECH 4182 Aerospace Structures: Analysis and Design	4	Effective Sept 2009
MECH 4192 Aerospace Materials and Manufacturing Processes	4	Effective Sept 2009
MECH 4292 IC Engines	4	Effective Sept 2009
MECH 4322 Contemporary Topics in Mechanical Engineering II	4	Effective Sept 2009
MECH 4342 Contemporary Topics in Manufacturing Engineering II	4	Effective Sept 2009
MECH 4350 Topics in Engineering Materials 1	4	Effective Sept 2009
MECH 4360 Topics in Engineering Materials 2	4	Effective Sept 2009
MECH 4412 Heating, Ventilation and Air Conditioning	4	Effective Sept 2009
MECH 4452 Aircraft Performance, Dynamics and Design	4	Effective Sept 2009
MECH 4510 Fundamentals of Finite Element Analysis	4	Effective Sept 2009
MECH 4532 Advanced Strength of Materials	4	Effective Sept 2009
MECH 4672 Advanced Mechanism Design	4	Effective Sept 2009
MECH 4692 Renewable Energy	4	Effective Sept 2009
MECH 4694 Advanced Topics in Heat Transfer	4	Effective Sept 2009
MECH 4702 Design of Thermal Systems	4	Effective Sept 2009
MECH 4812 Automotive Engineering	4	Effective Sept 2009
MECH 4822 Numerical Heat Transfer in Fluid Flow	4	Effective Sept 2009

Course introductions:

MECH 2012 Computer Aided Design and Manufacturing Processes Cr.Hrs. 4 +4
 Provide instruction on the application of computer aided design software packages. The students will work in groups in the design and development of a product using CAD packages. The course will be delivered through a combination of lectures and tutorials. Prerequisites: ENG 1430 (formerly 130.113 or 130.140). Not to be held with MECH 2010 or CIVL 2830.

MECH 2202 Thermodynamics Cr.Hrs. 4 +4
 (formerly MECH 2200 or 025.220) Cycles, transient flow processes, entropy, gas mixtures, psychrometry, combustion. Prerequisites: ENG 1460 (or 130.112), [MATH 1500 (or 136.150), or MATH 1510 (or 136.151)] and [MATH 1700 (or 136.170) or MATH 1710 (or 136.171)]. Not to be held for credit with MECH 2200 or 025.220.

MECH 2222 Mechanics of Materials Cr.Hrs. 4 +4
 Topics covered in this course include: axial and torsional loading, stress-strain and deformation in statically determinate/indeterminate systems, thermally induced stress, and stresses in beams (including reinforced beams) under pure bending and bending with shear. The mechanical properties of materials under various loading modes will be addressed. Prerequisites: PHYS 1050, ENG 1440, COMP 1010 and [MATH 1710 or MATH 1700]. Not to be held for credit with MECH 2220 (or 025.222) or MECH 2270 (or 025.227).

MECH 2262 Fundamentals of Fluid Mechanics Cr.Hrs. 4 +4
Fundamental concepts used in the analysis of fluid behaviour, pressure in stationary fluids, forces on submerged surfaces, buoyancy, integral methods, Bernoulli equation, pipeline analysis. Prerequisites: MATH 2130 or MATH 2110 (formerly 136.211). Pre- or Corequisite: MATH 2132 or MATH 2100 (formerly 136.210). Not to be held for credit with MECH 2260 (or 025.226).

MECH 2272 Engineering Materials 1 Cr.Hrs. 4 +4
Introduction to engineering materials; defects, strengthening mechanisms, and plasticity in engineering metals and alloys; fundamentals and application of heat treatment of metallic materials including topics such as diffusion, phase diagram, phase transformation, and thermal processing; mechanical properties of engineering metallic materials and their relationship to structure, defects, various strengthening mechanisms, and processing; structure of non-metallic polymers and ceramics. Prerequisites: CHEM 2240 (formerly 002.224) and MECH 2222 (or MECH 220 or 025.222). Not to be held for credit with MECH 2270 (or 025.227), MECH 2290 (or 025.229) or MECH 3540 (or 025.354).

MECH 3170 Project Management Cr.Hrs. 4 +4
Topics covered in this course will include project planning, scheduling, resource allocation, process analysis, layout and control. The course will make use of industrial projects for developing a strong design and analytical approach pertinent to project management. Prerequisites: MECH 2290 (formerly 025.229). Not to be held for credit with MECH 4170 (or 025.417).

MECH 3482 Kinematics and Dynamics Cr.Hrs. 4 +4
Fundamentals of 2D and 3D rigid body motions (kinematics) and the forces / moments (kinetics) needed to produce such motions. Applications will emphasize elements of machine design. Prerequisites: PHYS 1050 (formerly 016.105), ENG 1350 (formerly 130.135), COMP 1010 (formerly 074.101), and [MATH 1710 (formerly 136.171) or MATH 1700 (formerly 136.170)]. Not to be held for credit with MECH 2120 (or 025.212) or MECH 3480 (or 025.348).

MECH 3492 Fluid Mechanics and Applications Cr.Hrs. 4 +4
The angular momentum principle, introduction to differential analysis of fluid motion, internal and external incompressible viscous flow, fluid machinery and multiple-path systems, fluid coupling and torque couplings and torque converters. Prerequisites: PHYS 1050 (formerly 016.105), ENG 1350 (formerly 130.135), COMP 1010 (formerly 074.101), and [MATH 1710 (formerly 136.171) or MATH 1700 (formerly 136.170)]. Not to be held for credit with MECH 3490 (or 025.349).

MECH 3502 Stress Analysis and Design Cr.Hrs. 4 +4
Strength and stability of columns, torsion of thin-walled members, unsymmetric loading and shear centres, beam deflection and energy methods. Prerequisites: MECH 2222 (formerly MECH 2220 or 025.222) and MATH 2130 (formerly MATH 2110 or 136.211). Not to be held for credit with MECH 2220 (or 025.222) or MECH 3500 (or 025.350).

MECH 3542 Engineering Materials 2 Cr.Hrs. 4 +4
Mechanical properties of engineering non-metallic materials such as polymers, ceramics and composites, and their relationship to structure and processing; introduction to various shaping and joining processes used in manufacturing, their advantages and limitations; selection and application of engineering materials. Prerequisites: MECH 2272 (formerly MECH 2270 or

025.270). Not to be held for credit with MECH 2270 (or 025.227), MECH 2290 (or 025.229) or MECH 3540 (or 025.354).

MECH 3562 Introduction to Optimization Cr.Hrs. 4 +4
(formerly MECH 3560 or 025.356) The objective of this course is to develop the ability to formulate and analyze problems that will be encountered in a manufacturing system. The skills acquired will allow the students to approach problems from an optimization perspective. The students will be provided experience in related software packages. Prerequisites: MECH 2300 (formerly 025.230 or 025.217), and STAT 2220 (formerly 005.222). Not to be held with the former MECH 3560 (or 025.356 or 025.341).

MECH 3582 Manufacturing Planning and Quality Control Cr.Hrs. 4 +4
(formerly MECH 3580 or 025.358) The course covers topics such as: Group technology, Just-in-Time, Computer aided process planning, Statistical Process Control and Manufacturing Planning and Control. Issues related to the integration of several areas that fall with CIM are emphasized. Systems approach is introduced. Prerequisites: MECH 2300 (or 025.230). Not to be held for credit with MECH 3580 (or 025.358 or 025.485).

MECH 3592 Simulation Modeling and Facility Planning Cr.Hrs. 4 +4
(formerly MECH 3590 or 025.359) The objective of this course is to introduce simulation for manufacturing operations and the concepts of facilities location and layout. The students will learn how to program WITNESS, a simulation language, and through simulation, explore the effects of facility planning; resource availability e.g., machines and quality related problems on manufacturing productivity and timing. Not to be held for credit with MECH 3590 (or 025.359 or 025.471).

MECH 3980 Mechanical Laboratory Cr.Hrs. 4 +4
Laboratory course on topics that compliment and reinforce concepts developed in second and third year mechanical engineering courses. Comprehensive experiments followed by submission of laboratory reports will be required. Prerequisites: ENG 2010 (or 130.210), and MECH 2222 (or MECH 2220 or 025.222). Pre- or Corequisite: MECH 3420 (or 025.342). Not to be held for credit with MECH 4980 (or 025.498) and MECH 4990 (or 025.499).

MECH 4162 Thesis Cr.Hrs. 6 +6
(formerly MECH 4160 or 025.416) Each graduating student must submit a satisfactory thesis on a subject which will be designated or approved by the head of the department. Theses are to be handed in to the Department of Mechanical and Manufacturing Engineering office by the designated deadline. RESTRICTION: Only students with a year class distinction of 4 or higher in Mechanical or Manufacturing Engineering may register for this course. Prerequisites: ENG 2010 (or 130.201) and eligible to graduate. Not to be held for credit with MECH 4160 (formerly 025.416).

MECH 4182 Aerospace Structures: Analysis and Design Cr.Hrs. 4 +4
(formerly MECH 4180 or 025.418) Methodology and techniques for design of aerospace structures and components to preclude failure with minimum weight, cost and resource consumption. Analysis of structural, air, gust and maneuver loads. Prerequisite: MECH 3502 (or MECH 3500 or 025.350). Not to be held for credit with MECH 4180 (or 025.418).

MECH 4192 Aerospace Materials and Manufacturing Processes Cr.Hrs. 4 +4
(formerly MECH 4190 or 025.419) Properties of aerospace structural materials including glass and graphite fibre composites, light metal alloys and high strength steels. Properties of high

temperature materials; superalloys, ceramics, intermetallic compounds, metal matrix composites. Specialized methods for manufacture of these materials. Prerequisite: MECH 3542 (formerly MECH 3540 or 025.354). Not to be held for credit with MECH 4190.

MECH 4292 IC Engines Cr.Hrs. 4 +4
(formerly MECH 4290 or 025.429) Thermodynamics of internal combustion engine cycles; fuels and lubricants; supercharging; carburetion; valving; manifolding; combustion chamber ignition and fuel injection; engine performance and testing; free piston engines. Prerequisite: MECH 2202 (formerly MECH 2200 or 025.220). Not to be held for credit with MECH 4290 or 025.429).

MECH 4322 Contemporary Topics in Mechanical Engineering II Cr.Hrs. 4 +4
(formerly MECH 4320) This course will cover contemporary topics in Mechanical Engineering. The specific topics and a detailed outline will be available at the time of registration prior to the start of the registration period for the session in which the course will be offered. Prerequisite: Departmental Permission. Not to be held for credit with MECH 4320.

MECH 4342 Contemporary Topics in Manufacturing Engineering II Cr.Hrs. 4 +4
(formerly MECH 4340) This course will cover contemporary topics in Manufacturing Engineering. The specific topics and a detailed outline will be available at the time of registration prior to the start of the registration period for the session in which the course will be offered. Prerequisite: Departmental Permission. Not to be held for credit with MECH 4340.

MECH 4350 Topics in Engineering Materials 1 Cr.Hrs. 4 +4
This course will cover contemporary topics in engineering materials. The specific topics and a detailed outline will be available at the time of registration prior to the start of the registration period for the session in which the course will be offered. Prerequisite: Departmental Permission.

MECH 4360 Topics in Engineering Materials 2 Cr.Hrs. 4 +4
This course will cover contemporary topics in engineering materials. The specific topics and a detailed outline will be available at the time of registration prior to the start of the registration period for the session in which the course will be offered. Prerequisite: Departmental Permission.

MECH 4412 Heating, Ventilation and Air Conditioning Cr.Hrs. 4 +4
(formerly MECH 4410 or 025.441) Psychometric processes, equipment selection, and the design of heating and cooling systems for typical buildings. Prerequisite: MECH 2202 (formerly MECH 2200 or 025.220). Not to be held for credit with MECH 4410 (or 025.441).

MECH 4452 Aircraft Performance, Dynamics and Design Cr.Hrs. 4 +4
(formerly MECH 4450 or 025.445) A study of the morphology of aerospace vehicles; basic components and their functions. Aircraft performance; drag, thrust, lift, basics of orbital mechanics. Prerequisite: MECH 3520 (or 025.352). Not to be held for credit with MECH 4450 (or 025.445).

MECH 4510 Fundamentals of Finite Element Analysis Cr.Hrs. 4 +4
Fundamentals of the Finite Element Method, basic components in a Finite Element procedure, application of FEM to solve engineering problems and use of commercial software. Prerequisites: MATH 2120 (formerly 136.212) and [MATH 3132 or MATH 3100 (formerly 136.310)] and MECH 2222 (formerly MECH 2220 or 025.222).

- MECH 4532 Advanced Strength of Materials Cr.Hrs. 4 +4
(formerly MECH 4530 or 025.453) Stress and Strain in three dimensions: thick walled cylinders, beams of elastic foundations, unsymmetrical bending and sheet-stringer construction, curved beams. Additional topics such as the analysis of fibre-composite materials, techniques in experimental stress analysis and studies in metallics fatigue may be presented. Prerequisite: MECH 3502 (formerly MECH 3500 or 025.350). Not to be held for credit with MECH 4530 or 025.453.
- MECH 4672 Advanced Mechanism Design Cr.Hrs. 4 +4
(formerly MECH 4670 or 025.467) Graphical, analytical and computer techniques for the analysis and design of mechanisms to produce a desired set of motion characteristics; design of linkages, double lever, slider and dwell mechanisms; cognate linkages. Kinetic synthesis tasks function generation, path generation and motion generation. Prerequisite: MECH 3482 (formerly MECH 2120 or 025.212). Not to be held for credit with MECH 4670 or 025.467.
- MECH 4692 Renewable Energy Cr.Hrs. 4 +4
Introduction to renewable energy systems, current and future global energy issues and the need for renewable energy, renewable energy applications, and distributed renewable energy generation. Renewable energy systems that will be considered are: solar heat, solar PV, biomass heat and power, hydro power, and wind power. Students will develop simple numerical models of renewable energy systems. Prerequisites: MECH 2202 (formerly MECH 2200 or 025.220) and MECH 2262 (formerly MECH 2260 or 025.226). Pre- or Corequisite: MECH 3460 (formerly MECH 3470 or 025.347).
- MECH 4694 Advanced Topics in Heat Transfer Cr.Hrs. 4 +4
(formerly MECH 4690 or 025.469) Some combination of the following advanced topics: conduction heat transfer, radiation, heat-exchanger design, two-phase phenomena, fluidization, alternative energy, energy conservation. Other topics of current interest may also be included. Prerequisite: MECH 3460 (or MECH 3470 or 025.347). Not to be held for credit with MECH 4690 (or 025.469).
- MECH 4702 Design of Thermal Systems Cr.Hrs. 4 +4
(formerly MECH 4700 or 025.470) Modeling of thermal systems; system simulation; design applications of optimization methods: Lagrange multipliers, search methods, and dynamic geometric and linear programming. Prerequisite: MECH 2202 (or MECH 2200 or 025.220). Not to be held for credit with MECH 4700 (or 025.470).
- MECH 4812 Automotive Engineering Cr.Hrs. 4 +4
(formerly MECH 4810 or 025.481) Introduction to the design of passive suspension systems; control of active suspension systems; tire dynamics; ergonomics, safety and crash dynamics; automotive lighting and digital display trains. Prerequisite: MECH 3502 (formerly MECH 3500 or 025.350). Pre- or Corequisite: MECH 3420 (or 025.342). Not to be held for credit with MECH 4810 (or 025.481).
- MECH 4822 Numerical Heat Transfer in Fluid Flow Cr.Hrs. 4 +4
(formerly MECH 4820 or 025.482) General conservation equations; specific forms of the conservation equations and energy equations; finite difference methods; one dimensional steady problems; one dimensional unsteady problems; two dimensional steady problems; two dimensional unsteady problems; convection, solution for the flow field. Prerequisites: MATH 3132 (or MATH 3100 or 136.310), MATH 2120 (or 136.212), MECH 3460 (or MECH 3470 or

025.347) and MECH 3492 (or MECH 3490 or 025.349). Not to be held for credit with MECH 4820 (or 025.482).

Course deletions:

MECH 4180 Analysis and Design of Aerospace Structures Cr.Hrs. 3	+3
MECH 4190 Aerospace Materials and Adv. Manufacturing Processes Cr.Hrs. 3	+3
MECH 4290 Internal Combustion Engines Cr.Hrs. 3	+3
MECH 4320 Contemporary Topics in Mechanical Engineering 1 Cr.Hrs. 3	+3
MECH 4340 Contemporary Topics in Mechanical Engineering 2 Cr.Hrs. 3	+3
MECH 4410 Air Conditioning Cr.Hrs. 3	+3
MECH 4450 Aircraft and Spacecraft Performance and Dynamics Cr.Hrs. 3	+3
MECH 4530 Advanced Strength of Materials Cr.Hrs. 3	+3
MECH 4670 Applied Linkage Synthesis Cr.Hrs. 3	+3
MECH 4690 Topics in Heat Transfer and Energy Cr.Hrs. 3	+3
MECH 4700 Thermal System Design Cr.Hrs. 3	+3
MECH 4810 Automotive Engineering and Design Cr.Hrs. 3	+3
MECH 4820 Computational Methods for Thermofluids Cr.Hrs. 3	+3

Course modifications:

MECH 3420 Vibrations and Acoustics Cr.Hrs. 4
(formerly 025.342) Vibrations and computer simulations of single-degree-of-freedom systems, viscous and friction damping, MD of systems and modal analysis, measurement and sources of noise, noise control. Prerequisites: MECH 3482 [formerly MECH 2120 (or 025.212) and MECH 3480 (or 025.348)] and MATH 3132 (formerly MATH 3100 or 136.310).

MECH 3520 Aerodynamics Cr.Hrs. 4
(formerly 025.352) Aeronautical definitions, compressible flow, plane normal shock waves, Mach. No. and shock waves in two-dimensional flow, potential flow theory in two-dimensional and axisymmetric flows. Two-dimensional wing theory, finite wing theory panel methods, elements of boundary layer theory. Compressibility and wings, wing design, flow control. Prerequisite: MECH 3492 (or MECH 3490 or 025.349).

MECH 4200 Gas Turbine Propulsion Systems Cr.Hrs. 4
(formerly 025.420) Gas turbine systems, shaft power cycles, gas turbine propulsion cycles, centrifugal compressors, axial flow compressors, combustion systems, design performance predictions, off-design operations and transient behaviour of gas turbines. Design performance predictions. Prerequisites: MECH 2202 (or MECH 2200 or 025.220) and MECH 3520 (or 025.352).

MECH 4560 Selected Topics in Fluid Mechanics 4M Cr.Hrs. 4
(formerly 025.456) Topics may include: wind tunnel design; experimental techniques; some exact solutions of the conservation equations; fundamentals of turbulence; secondary flows; fluidization; elementary meteorology; fluidics; other topics of current interest. Prerequisites: MATH 3132 (formerly MATH 3100 or 136.310) and MECH 3492 (or MECH 3490 or 025.349).

MECH 4620 Corrosion of Metals and Alloys Cr.Hrs. 4
(formerly 025.462) Electrochemical basis of corrosion, corrosion prevention by cathodic protection, inhibitors, alloying and heat treatment, passivation, stress corrosion cracking,

corrosion fatigue; ionic and electronic conduction; oxidation of metals and alloys. Prerequisite MECH 3542 (or MECH 3540 or 025.354).

MECH 4650 Machine Design IVM Cr.Hrs. 4

(formerly 025.465) Stress analysis and the design of various machine elements; shafts and couplings, springs, threaded fasteners and power screws, clutches and power transmission components; spur, bevel, worm and helical gears; lubrication, journal and roller bearings.

Prerequisites: MECH 2120 (or 025.212) and MECH 3502 (or MECH 3500 or 025.350).

MECH 4680 Energy Conversion and Utilization Cr.Hrs. 4

(formerly 025.468) Energy supply and demand, advanced thermodynamic cycles, conventional energy sources, alternative energy, conservation of energy, environmental considerations.

Prerequisite: MECH 2202 (formerly MECH 2200 or 025.220).

MECH 4980 Mechanical Engineering Laboratory Cr. Hrs. 2

(formerly 025.498) Advanced laboratory course on topics covering different disciplines within mechanical engineering. Comprehensive experiments followed by submission of laboratory reports will be required. One lecture/week will be provided on issues related to experimental techniques. Prerequisites: ENG 2010 (or 130.201) and MECH 3420 (or 025.342).

NET CHANGE IN CREDIT HOURS: +91

Table VII: Mechanical Courses to be Deleted Effective September 2009 or at a later date

Course #	Course Title	Credit Hours	Deleted
MECH 2010	Computer Graphics for Mechanical and Manufacturing Engineers	2	TBA
MECH 2120	Mechanics of Machines	4	TBA
MECH 2200	Thermodynamics 2M	4	TBA
MECH 2220	Stress Analysis and Design	4	TBA
MECH 2260	Introduction to Fluid Mechanics	3	TBA
MECH 2270	Principles of Engineering Materials	4	TBA
MECH 2290	Manufacturing Engineering	3	TBA
MECH 2300	Introduction to Production Manufacturing	3	TBA
MECH 3480	Dynamics	3	TBA
MECH 3490	Advanced Fluid Mechanics and Design	3	TBA
MECH 3500	Stress Analysis and Design 3M	3	TBA
MECH 3540	Modern Engineering Materials	4	TBA
MECH 4160	Graduation Thesis	3	TBA
MECH 4170	Program Management and Systems Engineering	3	TBA
MECH 4180	Analysis and Design of Aerospace Structures	3	Effective Sept 2009
MECH 4190	Aerospace Materials and Advanced Manufacturing Processes	3	Effective Sept 2009
MECH 4290	Internal Combustion Engines	3	Effective Sept 2009
MECH 4320	Contemporary Topics in Mechanical Engineering 2	3	Effective Sept 2009
MECH 4340	Contemporary Topics in Manufacturing Engineering 2	3	Effective Sept 2009
MECH 4410	Air Conditioning	3	Effective Sept 2009
MECH 4450	Aircraft and Spacecraft Performance and Dynamics	3	Effective Sept 2009
MECH 4530	Advanced Strength of Materials	3	Effective Sept 2009
MECH 4670	Applied Linkage Synthesis	3	Effective Sept 2009
MECH 4680	Energy Conversion and Utilization	4	TBA
MECH 4690	Topics in Heat Transfer	3	Effective Sept 2009
MECH 4700	Thermal Systems Design	3	Effective Sept 2009
MECH 4810	Automotive Engineering and Design	3	Effective Sept 2009
MECH 4820	Computational Methods of Thermofluids	3	Effective Sept 2009
MECH 4980	Mechanical Engineering Laboratory 1	2	TBA
MECH 4990	Mechanical Engineering Laboratory 2	2	TBA

October 20, 2008

**Report of the Senate Planning and Priorities Committee on Undergraduate Changes with Potential Resource Implications or Course Changes Beyond Nine Credit Hours
Department of Mechanical and Manufacturing Engineering**

Preamble:

1. SPPC has the responsibility to report to Senate on curriculum changes with significant resource implications, including additions to departmental curricula of more than nine credit hours.
2. The committee reviewed a proposal from the Faculty of Engineering for a revision to the undergraduate curriculum in Mechanical and Manufacturing Engineering which has a net change of +91 credit hours.

Observations:

1. The Department of Mechanical and Manufacturing Engineering proposes a restructuring of the current undergraduate program. This will result in the termination of the Manufacturing Engineering program with no new students being admitted as of September 2009. A new Manufacturing option will be introduced as part of the Mechanical Engineering program.
2. The new curriculum will provide students with more course selection and flexibility.
3. While there is a large number of courses introduced at this time, a phase in period has been submitted for the deletion of courses.
4. The resources are in place to support the new courses as a part of the department's program.

Recommendation:

The Senate Planning and Priorities Committee recommends:

THAT Senate approve the curriculum and course changes from the Department of Mechanical and Manufacturing Engineering.

Respectfully submitted,

Norm Hunter, Chair
Senate Planning and Priorities Committee

/mb

Comments of the Senate Executive Committee:
The Senate Executive Committee endorses the report to Senate.

November 12, 2008

Report of the Senate Committee on Animal Care - Revised Policy and Procedures on Animal Care and Use

1. Preamble

- i. The terms of reference for the Senate Committee on Animal Care (SCAC) are found on the website at: http://umanitoba.ca/admin/governance/governing_documents/research/374.htm. SCAC "provides advice and recommendations to Senate and the University Administration regarding: the University's general policies relating to the development of facilities for and use of animals in research, teaching or testing; prioritizing support for the development and delivery of animal care services; and animal care and use policies and their effect on faculty members, staff and students".
- ii. Since last reporting to Senate, the SCAC met on October 14, 2008, to consider revisions to the Animal Care and Use Policy and Procedure documents.

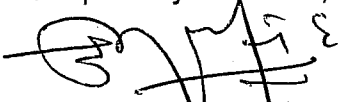
1. Observations

- i. In order to remain in full compliance with the Canadian Council on Animal Care (CCAC), it was necessary to revise the University's Animal Care and Use Policy and Procedure documents to incorporate new guidelines which have been recently published/released by the CCAC.
- ii. Opinions gathered during the revision of the University's Animal Care and Use Policy and Procedure documents were from the Vice President (Research); the Associate Vice-President (Research); the Director, Animal Care and Use Program; and the Office of Legal Counsel. In addition, these documents were also forwarded to UMFA (through Human Resources) for comment. No comments from UMFA were received.

1. Recommendations

- i. The Senate Committee on Animal Care recommends that the revisions to the Animal Care and Use Policy and Procedures documents be approved by Senate.

Respectfully submitted,



Digvir S. Jayas, Chair
Senate Committee on Animal Care

Comments of the Senate Executive Committee:
The Senate Executive Committee endorses
the report to Senate.

UNIVERSITY OF MANITOBA POLICY

Title: <u>Animal Care and Use</u>	Effective Date: _____ Review Date: _____
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Approving Body: ☐ Board of Governors ☒ Senate ☐ Administration (specify): _____

Authority: ☐ *University of Manitoba Act* Section # _____
 ☐ Other Legislation [name and section #] _____
 ☐ Bylaw [name and section #] _____
 X ☐ Policy [name and section #] Animal Care and Use

Implementation: Vice-President (Research), Vice-President (Administration), Vice-President (Academic) and Provost

Contact: Associate Vice-President (Research)

Applies to:	<input type="checkbox"/> Board of Governors members	<input checked="" type="checkbox"/> External Parties
	<input type="checkbox"/> Senate members	[adjunct professors, visiting scientists, n/l salary appointments]
	X <input checked="" type="checkbox"/> Faculty/School Councils	X <input checked="" type="checkbox"/> Employees
	X <input checked="" type="checkbox"/> Students and other trainees, eg. Post-doctoral fellows, Visiting scholars and Visiting students	[Specify applicable employee organizations and employment groups] _____ <u>All employees who use animals in research, teaching and/or testing.</u>

1.0 Reason for Policy

- 1.1 To affirm the University of Manitoba's commitment to maintaining high standards of animal care and use in animal-based research, teaching or testing, and to set out the principles under which animal care and use will be governed at the University of Manitoba.
- 1.2 To ensure adherence to the Applicable Requirements, as hereinafter set out, including without limitation to the policies and guidelines of the Canadian Council on Animal Care.

2.0 Policy Statement

2.1 Definitions

- 2.1.1 **Affiliated Entity** means organizations which have formal agreements with the University to conduct collaborative research;

- 2.1.2 **Animal** means living vertebrates and cephalopods;
- 2.1.3 **Animal User** means any person affiliated with the University who uses Animals in research, teaching, or testing at the University or elsewhere; and, any organization or person, not necessarily affiliated with the University, using Animals in research, teaching, or testing while on University premises or using University Facilities, equipment or resources;
- 2.1.4 **Applicable Requirements** means in relation to the care and use of Animals, any government legislation and/or regulations; professional and ethical codes; guidelines and standards to which the University adheres, including, among others, guidelines, standards and/or regulations by, or of,:
- a) the CCAC;
 - b) the Canadian Association of Laboratory Medicine;
 - c) the Canadian Veterinary Medical Association;
 - d) the Manitoba Veterinary Medical Association;
 - e) the University Animal Care Committee (the “ACC”); and
 - f) the Senate Committee on Animal Care (the “SCAC”).
- 2.1.5 **CCAC** means the Canadian Council on Animal Care;
- 2.1.6 **Facility** means a facility in which Animals are used by Animal Users where such facilities are owned and/or operated by either the University or an Affiliated Entity;
- 2.1.7 **Protocol** means the “Animal Use Protocol Form (Research/Teaching/Testing)”, which is submitted by an Animal User for consideration by the ACC, and contains a detailed description of the rationale of the study, describes the treatments and procedures to be performed on live Animals, and the experience and training of the Animal User;
- 2.1.8 **University Facility** means a facility in which Animals are used by Animal Users where such facilities are owned and/or operated by the University;
- 2.1.9 **Veterinary Services Staff** means individuals reporting to the Director, Animal Care and Use Program, who normally include, Clinical Veterinarians, Animal Health Technician Practitioners, Laboratory Animal Training Co-ordinator and Technicians;
- 2.1.10 Any references in the singular form shall be deemed to include the plural form where the meaning of a section so requires. In addition, any references to legislation/policies/regulations/guidelines, documents, committees or organizations shall be deemed to include successor or substitute forms of

legislation/policies/regulations/guidelines, documents, committees or organization.

2.2 Policy Statements Under Which Use Will be Governed

- 2.2.1 The use of Animals in research, teaching or testing is a privilege and can be undertaken only when a justifiable need is established by the Animal User to the ACC.
- 2.2.2 All care and use of Animals must follow Applicable Requirements.
- 2.2.3 Implementing and adhering to Applicable Requirements concerning the proper care and use of Animals in research, teaching or testing is an institutional responsibility shared by University Administration, including central, faculty and departmental administration; specially appointed committees; the Director, Animal Care and Use Program (“DACUP”); Veterinary Services Staff, Directors of Facilities; and Animal Users.
- 2.2.4 Before a project involving the use of Animals for research, teaching or testing is initiated or Animals are acquired, a Protocol must be submitted by the Animal User for approval by the appropriate ACC.
- 2.2.5 To ensure Animal Users are competent and thoroughly familiar with the Applicable Requirements, they must participate in education and training provided and stipulated by the University.
- 2.2.6 The University considers improper care and use of Animals in research, teaching or testing to be a serious offence, subject to severe penalties, including but not limited to, the withdrawal of Animal use privileges and/or disciplinary action.
- 2.2.7 To give effect to this policy, the University shall establish procedures and committees.

3.0 Accountability

- 3.1 The Vice-Presidents Research, Academic and Administration jointly bear responsibility for the implementation of this Policy. Such responsibility is hereby delegated to the Associate Vice-President (Research).
- 3.2 The University Secretary is responsible for advising the Vice-Presidents named in 3.1 above that a formal review of the Policy is required.

4.0 Secondary Documents

- 4.1 The Vice-President (Research) in consultation with the Senate Committee on Animal Care may approve Procedures which are secondary to and comply with this Policy.

5.0 Review

- 5.1 Formal Policy reviews will be conducted every ten (10) years. The next scheduled review date for this Policy is _____.
- 5.2 In the interim, this Policy may be revised or rescinded if:
- (a) the Approving Body deems necessary; or
 - (b) the relevant Bylaw, Regulations or Policy is revised or rescinded.
- 5.3 If this Policy is revised or rescinded, all Secondary Documents will be reviewed as soon as reasonably possible in order to ensure that they:
- (a) comply with the revised Policy; or
 - (b) are in turn rescinded.

6.0 Effect on Previous Statements

- 6.1 This Policy supersedes the following:
- (a) all previous Board/Senate Policies, Procedures, and resolutions on the subject matter contained herein; and
 - (b) all previous Administration Policies, Procedures, and directives on the subject matter contained herein;
- 6.2 This Policy supersedes Care and Use of Animals, revised June 2, 1999.

7.0 Cross References

Cross References

[Indicate names and numbers of other specific Governing Documents which should be cross referenced to this Governing Document. Include section # of other Governing Documents if appropriate.]

Cross referenced to: (1) Procedure(s) Animal Care and Use

UNIVERSITY OF MANITOBA PROCEDURE(S) _____

Title: Animal Care and Use	Effective Date:
	Review Date:

Approving Body: ☐ Board of Governors ☐ Senate ☒ Administration (specify): Vice-President (Research)

Authority: ☐ Bylaw [name and section #]
☐ Regulation [name and section #]
☒ Policy [name and section #] Animal Care and Use

Implementation: Associate Vice-President (Research)

Contact: Associate Vice-President (Research)

Applies to:	<input type="checkbox"/> Board of Governors members	<input checked="" type="checkbox"/> External Parties
	<input type="checkbox"/> Senate members	[adjunct professors, visiting scientists, nil salary appointments]
	<input checked="" type="checkbox"/> Faculty/School Councils	<input checked="" type="checkbox"/> Employees [Specify applicable employee organizations and employment groups]
	<input checked="" type="checkbox"/> Department Councils	All employees who use animals in research, teaching and/or testing
	<input checked="" type="checkbox"/> Students and other trainees, eg. Post-doctoral fellows, visiting scholars, and visiting students	

1.0 Reason for Procedure(s)

To enable the implementation of the Animal Care and Use Policy (the "Policy"), by establishing procedures relating to:

- 1.1 Responsibilities;
- 1.2 Protocol Review and Approval;
- 1.3 Education and Training;
- 1.4 Post Approval Monitoring;
- 1.5 Peer Review;
- 1.6 Animal Acquisition, Housing and Disposal;
- 1.7 Authority to Terminate Animal Use;
- 1.8 Appeal of Protocol Review Decisions; and
- 1.9 Non-Compliance.

2.0 Procedure(s)

2.1 Definitions

- 2.1.1 **Abbreviated Protocol for Minimal Animal Involvement** means a document submitted by an Animal User for consideration by a subcommittee of the ACC, and containing a brief description of the study which allows for confirmation of minimal Animal use.
- 2.1.2 **Academic Staff Member** means:
- (a) all Animal Users who fall into one of the categories defined in the University's Procedure entitled "Employee Organizations and Employment Group"; and, for the purposes of this Policy also include:
 - (b) all Animal Users holding nil-salaried appointments at the University of Manitoba (i.e., adjunct professorships, nil-salaried academic appointments, visiting scientists).
- 2.1.3 **Animal Facilities Staff** means personnel working with Animals in Facilities with their primary responsibility being Animal husbandry and/or Facility functioning.
- 2.1.4 **Category of Invasiveness or COI** means the categories defined by the CCAC describing the invasiveness of the procedures used on a live Animal. Invasiveness is based on the degree and duration of pain or physical distress associated with the procedure.
- 2.1.5 **Lead Investigator** means the Principal Investigator on a grant.
- 2.1.6 **Off-site Housing** means locations (other than the Facilities) in which Animals for use are housed.
- 2.1.7 **Principal Investigator** means the person identified as such on the Protocol.
- 2.1.8 **Research Personnel** refers to personnel, other than the Principal Investigator (PI), identified on the Protocol. Such persons are normally academic staff, visiting scientists, post doctoral fellows, research associates, technicians or students.
- 2.1.9 Any references in the singular form shall be deemed to include the plural form where the meaning of a section so requires.

2.2 Responsibilities

Implementing and adhering to Applicable Requirements concerning the proper care and use

of Animals in research, teaching or testing is an institutional responsibility shared by: the University Administration, including central, faculty and departmental administration; specially appointed committees, including the Senate Committee on Animal Care (SCAC) and the Animal Care Committees (ACCs); the Director, Animal Care and Use Program (DACUP), Veterinary Services Staff, Directors of Facilities and Animal Users. Notwithstanding this shared responsibility, the specific responsibilities of these individuals, groups/units, and committees are as follows:

2.2.1 The Associate Vice-President (Research) (AVPR) is responsible for the implementation of these Procedures.

2.2.2 The DACUP is responsible for providing overall direction to the University's Animal Care and Use Program.

2.2.3 Faculty/School Deans/Directors and Department Heads:

2.2.3.1 Faculty/School Deans/Directors and Department Heads have a general responsibility for the research, teaching or testing carried out in their Faculty/School or Department, and for encouraging and ensuring compliance with Applicable Requirements.

2.2.3.2 Deans/Directors of Faculties/Schools and Department Heads are responsible for the operations of the Facilities under their jurisdiction and for ensuring that they meet all Applicable Requirements. Deans/Directors of Faculties/Schools are responsible for ensuring funding to meet Applicable Requirements with respect to maintenance, upgrade, and long term planning of Facilities under their jurisdiction.

2.2.3.3 Deans/Directors of Faculties/Schools where Animals are used in research, teaching or testing are responsible for establishing a mechanism for assessing the scientific/instructional merit of those projects that are not subject to recognized peer review (refer to section 2.6).

Where a unit (e.g., Research Centre/Institute) reports directly to a Vice-President, these responsibilities are vested in the appropriate Vice-President.

2.2.4 The SCAC is responsible for ensuring University-wide understanding of, and compliance with, all Applicable Requirements. The specific composition and detailed terms of reference of the SCAC are determined by Senate and must accord with the requirements of the CCAC.

2.2.5 The ACCs are responsible for the ethical review of Protocols and ensuring compliance with the approved Protocols. ACC Chairs have delegated authority for

signature, on behalf of the University, of approved Protocols under their jurisdiction. ACC Chairs are responsible to the AVPR. The specific composition and detailed terms of reference of the ACCs are determined by the SCAC and must accord with the requirements of the CCAC.

- 2.2.6 The E-subcommittee of the ACC is responsible for the ethical review of Protocols for “E” Category of Invasiveness and for recommending, through a written report, the approval, hold or denial of the Protocol to the ACC. The specific composition and detailed terms of reference of the “E” subcommittee are determined by the SCAC and must accord with the requirements of the CCAC.
- 2.2.7 The Education Committee is responsible for the development and delivery of the education program as required by the CCAC. The specific composition and detailed terms of reference are determined by the SCAC and must accord with the requirements of the CCAC.
- 2.2.8 The Infrastructure Planning Committee is responsible for advising on Facility-related matters. The specific composition and detailed terms of reference are determined by the SCAC.
- 2.2.9 Local Animal Users Committees (the “LAUCs”), where established, are responsible for providing the respective Dean/Director with advice relevant to the Facility under their jurisdiction. The specific composition and detailed terms of reference of the LAUCs are determined by the Dean/Director.
- 2.2.10 Veterinary Services Staff are responsible for the provision of veterinary and Animal health care and ensuring that Animal welfare needs are addressed; supporting and facilitating the research program; promoting the education of Animal Users; and ensuring compliance with Applicable Requirements.
- 2.2.11 Directors of Facilities are responsible for: the overall operations of the Facilities, in particular, for the acquisition, daily maintenance and care of Animals in the Facility; ensuring that an approved Protocol is in place before Animals are acquired; ensuring that the actual use does not exceed the number approved by the ACC; providing leadership and advice in the maintenance and planning of Facilities; acting as a resource person to Animal Users regarding new protocol development; and informing the Dean/Director/Vice-President of concerns that may arise in the discharge of his/her duties. Directors of Animal Facilities may vary in terms of reporting structure and title.
- 2.2.12 PIs are responsible for designing and carrying out their research, teaching or testing activities in accordance with the Applicable Requirements, which include: ensuring an approved Protocol is in place prior to initiation of work or acquisition of

Animals; ensuring Protocols are adhered to; ensuring Research Personnel are appropriately trained; educating Research Personnel in the rationale for and implementation of Applicable Requirements; and ensuring that Research Personnel working under their supervision respect and observe Applicable Requirements.

- 2.2.13 Academic Staff Members with appropriate expertise are also expected to serve, as may be reasonably required, on the university's animal care and use committees including but not limited to the SCAC, ACCs, LAUCs, and the Education Committee.
- 2.2.14 Research Personnel are responsible for carrying out the care and use of Animals in accordance with Applicable Requirements.

2.3 Protocol Review and Approval

- 2.3.1 Protocols containing A and B COI procedures are distributed for review to three members of the applicable ACC which must include a Clinical Veterinarian, a community representative, and one other ACC member. A copy of the Protocol is forwarded to the applicable ACC Chair. The status of the Protocol review is reported to the full ACC. Copies of all Protocols are available to all ACC members at any time upon request.
- 2.3.2 Protocols containing C and D COI procedures are distributed to the applicable ACC for review by the full committee at the scheduled ACC meeting.
- 2.3.3 Protocols containing E COI procedures are only approved by the ACC in exceptional cases and only on the recommendation of the E-subcommittee, which will submit a written report and recommendation to the ACC.
- 2.3.4 Following review, Protocols will be assigned a classification that either allows use to proceed or which requires additional input or modification prior to use proceeding. Protocols which allow use to proceed will be assigned one of the following classifications: approval; approval subject to; or provisional approval. Protocols which require additional input or modification prior to use proceeding will be assigned one of the following categories: conditional approval or hold. Protocols found to be ethically unacceptable, will be assigned a category of denied.
- 2.3.5 ACCs are responsible for ensuring that all proposed activities involving the use of Animals have been reviewed for scientific/instructional merit (refer to section 2.6).
- 2.3.6 An approved Protocol is not to be modified without the written approval of a Clinical Veterinarian and the Chair of the appropriate ACC. An amendment form must be completed by the Animal User when requesting such a modification.

- 2.3.7 Protocol approvals are valid for one year from the date approved.
- 2.3.8 Where an Academic Staff Member enters into a collaborative project with researchers at another CCAC approved institution (the “host institution”) and the care and use of Animals occurs at the host institution, the following will apply:
- 2.3.8.1 Where the Academic Staff Member receives products from Animals but does not dictate or participate in the use, the Academic Staff Member is required to complete an Abbreviated Protocol for Minimal Animal Involvement.
 - 2.3.8.2 Where the Academic Staff Member dictates or participates in collaborative research but is not the Lead Investigator (the “LI”), a copy of the approved Protocol from the host institution may be accepted by the ACC.
 - 2.3.8.3 Where the Academic Staff Member is the LI on the project, a University of Manitoba Protocol must be completed even if a Protocol is approved at the host institution.
 - 2.3.8.4 Where the Academic Staff Member is employed at another CCAC approved institution (the “home institution”) and also has an academic appointment at the University of Manitoba (i.e., adjunct professorship, visiting scientist, or nil-salaried academic appointment), use of Animals undertaken at the Academic Staff Member's home institution does not require a University of Manitoba Protocol.

2.4 Education and Training

The Education Committee will develop an education program as required by the CCAC.

To ensure Animal Users are competent and thoroughly familiar with the Applicable Requirements, they must participate in the education and training stipulated and provided by the University.

- 2.4.1 PIs and Research Personnel are expected to complete the Animal User training course prior to initiating Animal use and to attend a refresher course every 5 years. PIs and Research Personnel are expected to complete wet labs as required. Requirements are based on experience, the procedures being performed, and requirements of the appropriate ACC. Wet labs are to be completed prior to Animal use being initiated where possible and, in all cases, before unsupervised Animal use is initiated.

- 2.4.2 Animal Facilities Staff must complete the Animal User training course. For newly appointed personnel, a grace period will normally be provided but will not extend beyond 3 months.
- 2.4.3 Veterinary Services Staff must complete the Animal User training course. For newly appointed personnel, a grace period will normally be provided but will not extend beyond 3 months.

2.5 Post Approval Monitoring

The ACCs, Veterinary Services Staff, Animal Facilities Staff and Animal Users currently are responsible for post approval monitoring. The process currently in place is as follows:

2.5.1 Information Acquisition

- 2.5.1.1 Procedures as described in Protocols to be subjected to post approval monitoring are flagged by the ACC during the Protocol review process and/or by Veterinary Services Staff at any time.
- 2.5.1.2 Animal Users inform Veterinary Services Staff when procedures that have been flagged for post approval monitoring will be initiated.
- 2.5.1.3 Facilities are responsible for informing Veterinary Services Staff when Animals have been ordered or requested.
- 2.5.1.4 Animal Users are responsible for informing Veterinary Services Staff of unexpected signs of pain, distress or mortality of Animals which occur during the Animal use.
- 2.5.1.5 Veterinary Services Staff are responsible for informing the ACCs of the results of post approval monitoring activities.

2.5.2 Monitoring

- 2.5.2.1 Veterinary Services Staff monitor flagged or invasive procedures during rounds or in specially arranged meetings.
- 2.5.2.2 When Animal Facilities Staff observe the use of procedures which are not approved in the Protocol, a report is made to the Director of the Facility and/or Veterinary Services Staff for immediate action. The Director of the Facility or Veterinary Services Staff will inform the ACC in a timely manner, usually at the next ACC meeting.

2.5.2.3 Records, such as surgical/anesthesia records and mortality data, are monitored by Veterinary Services Staff on a routine basis for indications of unexpected pain, distress or mortality.

2.5.2.4 The ACCs scrutinize Protocol renewals for indications of unexpected pain, distress or mortality.

2.5.3 Problem Solving

2.5.3.1 Unexpected pain, distress or mortality

2.5.3.1.1 In cases where information from direct communications, records or protocol renewals indicate procedures may be causing higher than expected levels of pain, distress or mortality, a Veterinarian (or designate) meets with the Animal User(s) to assess/rectify the problem.

2.5.3.2 Noncompliance

2.5.3.2.1 In the first instance of noncompliance, the ACC Chair or a Clinical Veterinarian meets with the Animal User(s). Education and assistance is the focus of this discussion.

2.5.3.2.2 In cases of repeated noncompliance or serious non-compliance, 2.10 Non-Compliance, is followed.

2.6 Peer Review

2.6.1 To ensure that use of Animals is undertaken only in necessary and valid projects, all projects must be evaluated for scientific or instructional merit. The majority of projects undergo peer review for scientific merit by the sponsor, e.g., proposals to national granting councils/agencies. In cases where the sponsor does not use adequate peer review to assess the quality of the proposed research, the proposal must be independently peer-reviewed and recommended, with documentary evidence of that review submitted to the ACC.

2.6.2 Deans/Directors of Faculties/Schools where Animal use is undertaken are responsible for establishing a mechanism for assessing the scientific/instructional merit of those projects that are not subject to recognized peer review by a sponsor, e.g., a national granting council/agency. The mechanism established must involve at least two persons capable of an independent and critical assessment of the proposed use. The mechanism for each Faculty must be approved by the SCAC.

2.7 Animal Acquisition, Housing and Disposal

- 2.7.1 An approved Protocol is required before Animals may be purchased, bred or otherwise brought into Facilities or Off-site Housing.
- 2.7.2 Arrangements for Animal acquisition and housing must be made in accordance with Facility requirements. The approval of a Protocol or the authorization of research funding is no guarantee that the University will be able to breed or acquire, house and care for the Animals specified. If, at the time the use is to be undertaken, the capacity of the Facilities is otherwise fully utilized, the use may have to be modified or rescheduled.
- 2.7.3 All Animals must be procured, transported and received according to *CCAC Guidelines on: procurement of animals used in science*. In order to comply with these guidelines, the following must be adhered to:
 - 2.7.3.1 For Animals caught in the wild or donated to the University, the Clinical Veterinarian must receive prior notification and approve receipt of the Animals. All Animals that are wild and are acquired by the University must be obtained and transported in compliance with all applicable wildlife, transport of exotic biota and endangered biota regulations in the jurisdiction of origin, as well as in Canada and Manitoba.
 - 2.7.3.2 Animals to be acquired through suppliers who are either new suppliers to the University or with whom the University has had prior problems, must be inspected by a Clinical Veterinarian or a designate preferably prior to shipping but before acceptance.
 - 2.7.3.3 An Animal acquisition letter of agreement must accompany Animals upon arrival from sources which do not sell purpose bred Animals.
- 2.7.4 Animals must be housed in Facilities or at Off-site Housing which are inspected annually by an ACC and approved by the SCAC and are in compliance with Applicable Requirements.
 - 2.7.4.1 Off-site Housing is not normally allowed due to the difficulty of monitoring the health and welfare of Animals, husbandry practices, research procedures and Protocol adherence. Exceptions to this may be granted by the ACC if scientific justification is provided.
 - 2.7.4.2 In cases where Off-site Housing has been approved, the Animal User must either: a) comply with requests from the ACC for information regarding the physical nature of the site, methods of Animal husbandry,

handling and capture, housing and/or procedures and the Off-site Housing must agree to an inspection by the ACC when requested or; b) provide assurance that the site has a CCAC Good Animal Practice certificate or equivalent. If the Off-site Housing is outside of Canada, a description of the practices and or the name of the agency that assures Animal welfare may be required.

2.7.5 Wherever possible, all procedures on live Animals should be conducted in Facilities. The amount of time Animals are held in laboratories must be minimized and must not exceed 24 hours. Animals cannot be held outside Facilities without ACC approval. Laboratories in which live Animals are held must be inspected annually by the appropriate ACC.

2.7.6 All breeding colonies will normally be managed by the respective Animal Facilities Staff in order to manage breeding colony production, ensure transparency and maintain accurate Animal usage records.

2.7.6.1 The ACC may approve breeding colony management by an Animal User who provides adequate scientific justification. Normally, this would occur only when the breeding itself is an integral part of the research procedures.

2.8 Authority to Terminate Animal Use

2.8.1 Clinical Veterinarians and the DACUP have the authority to: stop any objectionable procedure if it is considered that unnecessary distress or pain is being experienced by an Animal; stop immediately any use of Animals which deviates from the approved use, any non-approved procedure, or any procedure causing unforeseen pain or distress to Animals; and humanely kill an Animal if pain or distress caused to the Animal is not part of the approved Protocol and cannot be alleviated. Clinical Veterinarians also have the authority to treat, remove from a study or euthanize an Animal, if necessary.

2.8.2 In addition, ACC chairs, or their designates, in consultation with a Clinical Veterinarian or the DACUP, have the same authority as noted in 2.8.1.

2.9 Appeal of Protocol Review Decisions

2.9.1 An appeal of a decision to reject a Protocol shall be made to the DACUP.

2.9.2 The appellant and the ACC Chair will be invited to meet with the DACUP in order to either 1) resolve the outstanding issues or 2) clearly document the issues of disagreement between the ACC and the appellant.

- 2.9.3 If the ACC Chair and the appellant, in consultation with the DACUP, are unable to come to an acceptable resolution of the differences, the DACUP will refer the appeal, complete with the documented issues, to the SCAC Chair, who with the advice and approval of the SCAC, will establish a sub-committee of three members to hear the appeal and recommend to the SCAC.
- 2.9.4 In such cases, both the appellant and the Chair of the applicable ACC shall be given an opportunity to appear before the appeal **sub**-committee.
- 2.9.5 The decision of the SCAC shall be final and binding.

2.10 Non-Compliance

- 2.10.1 Instances of non-compliance with the Policy or these Procedures shall be brought to the attention of the Chair of the appropriate ACC and the DACUP for documentation and resolution.
- 2.10.2 If a resolution is not reached or the problem recurs, the DACUP shall advise the Chair of the SCAC who shall attempt to obtain a satisfactory resolution through the appropriate Dean/Director.
- 2.10.3 Serious instances of noncompliance or repetitive breaches in Policy and Procedures shall be forwarded by the SCAC Chair to the Vice-President (Academic) and Provost for disposition.

3.0 Accountability

- 3.1 The University Secretary is responsible for advising the Vice-President (Research) that a formal review of the procedures is required.

4.0 Review

- 4.1 Formal Procedure reviews will be conducted every ten (10) years. The next scheduled review date for these Procedures are _____.
- 4.2 In the interim, this/these Procedure(s) may be revised or rescinded if:
(a) the Approving Body deems necessary; or
(b) the relevant Bylaw, Regulation(s) or Policy is revised or rescinded.

5.0 Effect on Previous Statements

- 5.1A This/these Procedure(s) supersede(s) the following:

- a) all previous Board/Senate Procedures, and resolutions on the subject matter contained herein; and
- b) all previous Administration Procedures, and resolutions on the subject matter contained herein; and
- c) all previous Faculty/School Council Procedures stemming from the Faculty/School Council Bylaw and academic and admission Regulations and any resolutions on the subject matter contained herein.

6.0 Cross References

Cross References

Indicate names and numbers of other specific Governing Documents which should be cross referenced to this Governing Document. Include section # of other Governing Documents if appropriate.

Animal Care and Use Policy




UNIVERSITY
OF MANITOBA

Office of the University Secretary

312 Administration Building
Winnipeg, Manitoba
Canada R3T 2N2
Telephone (204) 474-9593
Fax (204) 474-7511

MEMORANDUM

DATE: October 29, 2008
TO: Dr. David Barnard, Chair of Senate
FROM: Jeff M. Leclerc, University Secretary 
SUBJECT: Chairs and Professorships Policy and Procedures

I attach for the consideration of the Senate and the Board of Governors a draft Policy and Procedures on Chairs and Professorships. These documents were developed with the cooperation of the Vice-President (Academic) and Provost, the Vice-President (Research) and the Vice-President (External).

These documents combine the existing Policies on Chairs and Professorships and the Naming of Chairs and Professorships, while updating the policy language and separating policy matters from procedural matters.

In accordance with the UMFA-UM Collective agreement, UMFA was provided an opportunity to comment on the proposed Policy and Procedure.

I request that these documents be placed before the appropriate bodies at their next meetings.

/jml

Comments of the Senate Executive Committee:
The Senate Executive Committee endorses
the report to Senate.

UNIVERSITY OF MANITOBA POLICY

No. _____	Effective Date _____
Title: <u>Chairs and Professorships</u>	Review Date _____
Approving Body: <input checked="" type="checkbox"/> Board of Governors <input type="checkbox"/> Senate <input type="checkbox"/> Administration (specify): _____	
Authority <input checked="" type="checkbox"/> <i>University of Manitoba Act</i> Section # 16(1)b _____ <input type="checkbox"/> Other Legislation [name and section #] _____ <input type="checkbox"/> Bylaw [name and section #] _____ <input type="checkbox"/> Regulation _____	
Implementation: <u>President, delegated to the Vice-President (Academic) & Provost</u> Contact: <u>Vice-President (Academic) & Provost</u>	
Applies to: <input type="checkbox"/> Board of Governors members <input type="checkbox"/> External Parties <input type="checkbox"/> Senate members [Specify applicable external parties] <input type="checkbox"/> Faculty/School Councils <input type="checkbox"/> Employees <input type="checkbox"/> Students [Specify applicable employee organizations and employment groups]	

1.0 Reason for Policy

The University continually seeks to develop and enhance its academic programs and activities. To this end, it welcomes external funding from donors that will assist the University in discharging its academic responsibilities. The establishment of Chairs or Professorships is one way in which this may be achieved.

The University is committed to the tradition and importance of Chairs and Professorships as a means of developing, recognizing and promoting academic programs and fields of study that are consistent with the University's mission and scholarly objectives. To this end, it has developed a policy and attendant procedures governing the establishment of Chairs and Professorships.

2.0 Policy Statement

- 2.1** This policy and its attendant procedures pertain to sponsored academic appointments where the appointees are selected by a process that is internal to and determined by the University. It does **not** pertain to academic appointments where the appointee is selected by other means (e.g. those that are underwritten by the national granting agencies). It also does **not** apply to visiting professorships.

2.2 This policy applies to all new initiatives and shall have no retroactive application, that is, it shall not apply to Chairs and Professorships that were established before the approval of this policy. Such Chairs and Professorships shall be governed by the policy in place at the time of their establishment. If, however, a previous gift becomes sufficient to change, for example, a Professorship to a Chair, this change shall be made in accordance with this policy.

2.3 Purpose, Definitions and Criteria

2.3.1 Chairs and Professorships are established to advance the University's academic goals and objectives.

2.3.2 The primary distinction between Chairs and Professorships is the extent of external funding that is available to support the appointment.

2.3.2.1 A **Chair** normally must, at its establishment, be fully funded from sources outside of the University's regular operating budget. The funding for a Chair normally must be sufficient to cover the full salary and benefits of the incumbent and an appropriate level of unrestricted research/scholarly support.

2.3.2.2 A **Professorship** normally must, at its establishment, be partially funded from sources outside of the University's operating budget. The funding for a Professorship normally must be sufficient to cover at least 20 percent of the salary and benefits of the incumbent and an appropriate level of unrestricted research/scholarly support.

2.3.3 For Chairs and Professorships, funds may be provided by way of an endowment or through a schedule of annual expendable gifts for a defined period of not less than five years, or by an appropriate combination of endowment and annual expendable gifts.

2.3.4 From their inception, Chairs and Professorships shall normally be attached to a department, faculty, school, college, centre or institute of the University. Accordingly, the goals of the Chair or Professorship shall be consistent with those of the unit to which it is attached.

2.3.5 The establishment of a Chair or Professorship normally shall not be tied to the appointment of a particular individual.

2.3.6 Individuals appointed to Chairs and Professorships normally shall have academic qualifications commensurate with an appointment at the rank of Professor.

2.3.7 The initial term of appointment of Chairs and Professorships shall be three to five years. If the renewal of an appointment is permitted, such renewal is subject to a successful performance review and the availability of funds.

2.4 Value of Chairs and Professorships

2.4.1 From time to time, normally for a three-year period or for the period of a capital campaign, the University President shall determine minimum values for any and all newly established Chairs and Professorships. These values shall be based on the requirements of this policy, as stipulated in the definitions of Chairs and Professorships (see sections 2.3.2.1 and 2.3.2.2).

2.4.2 Nothing in this section will prevent a unit from augmenting the support provided to a Chair or Professorship under 2.4.1 above.

2.5 Joint Chairs or Professorships

2.5.1 A Chair or Professorship may be established jointly by the University and another

university, an institution affiliated with the University (including teaching hospitals) or a research institute.

- 2.5.2 Such joint Chairs and Professorships shall be established on terms jointly agreed to by the parties. In such cases, funds may be held either by the University or by the other party, or both.

2.6 Establishment of Chairs and Professorships

- 2.6.1 All proposals for the establishment of Chairs and Professorships shall be considered by Senate and, following recommendation by Senate, by the Board of Governors. In the case of proposals for Chairs and Professorships that are primarily intended to enhance the University's research programs, the Senate Committee on University Research shall recommend to Senate.

2.7 Naming of Chairs and Professorships

- 2.7.1 Should the University wish to honour a donor(s) or at the request of a donor(s), Chairs and Professorships may be formally named.
- 2.7.2 The underlying principle of any naming is that both the person(s) or organization(s) for which the Chair or Professorship will be named and the University should be honoured by the naming of the Chair or Professorship.
- 2.7.3 The name may refer to a foundation, individual, family or similar unit, or to a respectable commercial or business unit.
- 2.7.4 If a Chair or Professorship is being named in recognition of a donor(s), the gift received relative to the Chair or Professorship must represent a significant contribution to the minimum value required to establish a Chair or Professorship as defined in section 2.4.1. The President shall determine the significance of any gift relative to the naming of a Chair or Professorship.
- 2.7.5 The autonomy of the University and the academic freedom of the professoriate to which the University of Manitoba is committed shall be safeguarded at all times. The attribution of a name does not imply or confer any involvement or oversight into the operations of the University or any of its units.
- 2.7.6 It is the University's intention to respect the Donor's intent. If, however, circumstances change so that the entire amount of the gift is not received by the University in due course, the University may, at its option, remove the Donor's name from the Chair or Professorship, or any part therein or thereon where the Donor's name appears, and/or reduce the name or form of recognition set out herein and/or offer the Donor an alternate naming opportunity and benefits commensurate with the Donor's level of giving.
- 2.7.7 In the event that a program change affects the naming and form of recognition, the University will inform the Donor if possible, and the University and the Donor will consult as to options available at that time.
- 2.7.8 Ultimate authority to accept or decline any naming proposal at the University of Manitoba rests with the Board of Governors.
- 2.7.9 Ultimate authority to discontinue the named Chair or Professorship rests with the Board of Governors.
- 2.7.10 Notwithstanding any other provisions of this policy, no naming will be approved or

2.8 Disestablishment of Chairs or Professorships

- 2.8.1 Chairs and Professorships may be disestablished by mutual agreement of the University and the donor(s).

2.9 Procedures

- 2.9.1 To give effect to this policy, the University shall establish certain mechanisms. These mechanisms shall include an articulation of:
- a. procedures for the establishment of Chairs and Professorships;
 - b. procedures for the selection and appointment of individuals to Chairs and Professorships;
 - c. procedures for the naming of Chairs and Professorships;
 - d. responsibilities of individuals appointed to Chairs and Professorships; and
 - e. requirements regarding the review of the performance of individuals appointed to Chairs and Professorships, and the administrative and financial arrangements of Chairs and Professorships.

3.0 Accountability

- 3.1 The University Secretary is responsible for advising the President that a formal review of the Policy is required.

4.0 Secondary Documents

- 4.1 The President may approve Procedures which are secondary to and comply with this Policy.

5.0 Review

- 5.1 Formal Policy reviews will be conducted every ten (10) years. The next scheduled review date for this Policy is January 1, 2019.
- 5.2 In the interim, this Policy may be revised or rescinded if:
- (a) the Approving Body deems necessary; or
 - (b) the relevant Bylaw, Regulations or Policy is revised or rescinded.
- 5.3 If this Policy is revised or rescinded, all Secondary Documents will be reviewed as soon as reasonably possible in order to ensure that they:
- (a) comply with the revised Policy; or
 - (b) are in turn rescinded.

6.0 Effect on Previous Statements

- 6.1 This Policy supersedes:
- (a) Policy: Chairs and Professorships, approved May 23, 1993 and amended June 22, 2000.
 - (b) Policy: Naming Chairs and Professorships, approved January 6, 1982 and amended September 6, 1990.

7.0 Cross References

Cross References

[Indicate names and numbers of other specific Governing Documents which should be cross referenced to this Governing Document. Include section # of other Governing Documents if appropriate.]

Cross referenced to: (1) Procedures, Chairs and Professorships (3) _____

(2) _____ (4) _____



UNIVERSITY OF MANITOBA PROCEDURE(S)

No. _____	Effective Date: _____
Title: <u>Chairs and Professorships</u>	Review Date: _____
Approving Body: <input type="checkbox"/> Board of Governors <input type="checkbox"/> Senate <input checked="" type="checkbox"/> Administration (specify): <u>President</u>	
Authority: <input type="checkbox"/> Bylaw [name and section #] _____ <input type="checkbox"/> Regulation [name and section #] _____ <input checked="" type="checkbox"/> Policy [name and section #] <u>Chairs and Professorships, s. 4.1</u>	
Implementation: <u>President, delegated to the Vice-President (Academic) & Provost</u>	
Contact: <u>Vice-President (Academic) & Provost</u>	
Applies to: <input type="checkbox"/> Board of Governors members <input type="checkbox"/> External Parties _____ <input type="checkbox"/> Senate members <input type="checkbox"/> [Specify applicable employee organizations] <input type="checkbox"/> Faculty/School Councils <input type="checkbox"/> Employees _____ <input type="checkbox"/> Department Councils <input type="checkbox"/> [Specify applicable employee organizations and employment groups] <input type="checkbox"/> Students	

1.0 Reason for Procedure(s)

To give effect to the Policy: Chairs and Professorships, these procedures articulate certain mechanisms, including:

- a) procedures for the establishment of Chairs and Professorships;
- b) procedures for the selection and appointment of individuals to Chairs and Professorships;
- c) procedures for the naming of Chairs and Professorships;
- d) responsibilities of individuals appointed to Chairs and Professorships; and
- e) requirements regarding the review of performance of individuals appointed to Chairs and Professorships, and the administrative and financial arrangements of Chairs and Professorships.

2.0 Procedure(s)

2.1 Establishment of Chairs or Professorships

- 2.1.1 The initiative to establish a Chair or Professorship may come from a department, faculty, school, college, centre or institute of the University, from the President, a Vice-President or from a prospective donor(s).
- 2.1.2 Confidential discussions with a prospective donor(s) may precede the development of a formal proposal to establish a Chair or Professorship.
- 2.1.3 A formal proposal for the establishment of a Chair or Professorship shall normally be made by the head of the unit to which the Chair or Professorship will be attached. All such proposals shall have the approval of the relevant dean or director, where applicable, and the Vice-President (Academic) and Provost. In the case of proposals for Chairs and Professorships that are primarily intended to enhance the University's research programs, the Vice-President (Academic) and Provost shall consult with the Vice-President (Research) in assessing the

proposal. The proposal shall indicate:

- a) the type of appointment (Chair, Professorship);
- b) the name of the Chair or Professorship;
- c) the purpose and objectives of the Chair or Professorship;
- d) the relationship of the goals of the Chair or Professorship to those of the proposing unit;
- e) the method by which the Chair or Professorship will be funded;
- f) the general and specific required academic qualifications of the candidates or nominees;
- g) the term of the appointment, including, where applicable, provisions for reappointment; and
- h) any other provisions unique to the Chair or Professorship.

- 2.1.4 All proposals for the establishment of Chairs and Professorships shall be considered by Senate and, following recommendation by Senate, by the Board of Governors. In the case of proposals for Chairs and Professorships that are primarily intended to enhance the University's research programs, the Senate Committee on University Research shall recommend to Senate.

2.2. Naming of Chairs and Professorships

- 2.2.1 Proposals for the naming of a Chair or Professorship to honour an individual or at the request of a donor shall be submitted to the Senate Committee on Honorary Degrees for recommendation to Senate.
- 2.2.2 The Senate Committee on Honorary Degrees will recommend to Senate on the specific form of the name for the Chair or Professorship.

2.3 Selection and Appointment of Chairs or Professorships

- 2.3.1 The selection and appointment of an individual to a Chair or Professorship shall be conducted in accordance with normal University policy (including Policy: Appointment of Academic Staff) and/or the provisions of the relevant Collective Agreement (except as provided in section 2.3.2).
- 2.3.2 Notwithstanding the provisions of Policy: Appointment of Academic Staff, in cases where it is proposed that a member of the University's full-time (including G.F.T.) academic staff be appointed to a Chair or Professorship, such an appointment may be made without a search with the approval of the Vice-President (Academic) and Provost, normally on the recommendation of the unit head and, where appropriate, the dean or director.
- 2.3.3 Nothing in sections 2.3.1 and 2.3.2 will be deemed to prevent the University or the relevant unit of the University from providing an opportunity for consultation with the donor(s), or their representative(s). Responsibility for the appointment of individuals to Chairs and Professorships, however, rests solely with the University.
- 2.3.4 Appointees to Chairs and Professorships may be granted tenured, probationary, term or contingent appointments, as approved by the Board of Governors.
- 2.3.5 Appointees to Chairs and Professorships normally shall be full-time employees of the University (except for Joint Chairs or Professorships).

2.4 Responsibilities of Appointees to Chairs and Professorships

- 2.4.1 The specific duties and responsibilities of appointees to Chairs and

Professorships shall be stated in a formal letter of offer.

- 2.4.2 While Chairs and Professorships may allow for a greater concentration on research, scholarship and creative works than that afforded by a regular academic appointment, a reasonable commitment to teaching is expected of all appointees to Chairs and Professorships.
- 2.4.3 During the first year of the appointment, appointees to Chairs and Professorships shall normally be required to give a public lecture. The scheduling and announcement of such lectures shall normally be coordinated by the relevant unit head, in collaboration with the University's Department of Public Affairs.
- 2.4.4 Appointees to Chairs and Professorships shall report annually, in the same manner as other faculty, to their unit head. Holders of Chairs and Professorships shall furnish an annual report of activities to the unit head, the dean or director, where applicable, and the Vice-President (Academic) and Provost. In the case of Chairs and Professorships that are primarily intended to enhance the University's research programs, an annual report of activities shall also be provided to the Vice-President (Research).

2.5 Review of Chairs and Professorships

- 2.5.1 The performance of appointees to Chairs and Professorships shall be reviewed in the same manner as other members of faculty.
- 2.5.2 If appointment renewal is permitted, the unit head or, where applicable, the dean or director is responsible for initiating and coordinating a timely reappointment review process. The resulting recommendation on reappointments shall be reported to the Vice-President (Academic) and Provost.
- 2.5.3 The administrative and financial arrangements pertaining to a Chair or Professorship shall be reviewed on a periodic basis but not less than every five years. The unit head or, where applicable, the dean or director is responsible for initiating and coordinating this review. The results of this review shall be reported to the Vice-President (Academic) and Provost.

3.0 Accountability

- 3.1 The University Secretary is responsible for advising the President that a formal review of the Procedure is required.

4.0 Review

- 4.1 Formal Procedure reviews will be conducted every ten (10) years. The next scheduled review date for this/these Procedure(s) is/are January 1, 2019.
- 4.2 In the interim, this/these Procedure(s) may be revised or rescinded if:
 - (a) the Approving Body deems necessary; or
 - (b) the relevant Bylaw, Regulation(s) or Policy is revised or rescinded.

5.0 Effect on Previous Statements

5.1 These procedures supersede:

- (a) Policy: Chairs and Professorships, approved May 23, 1993 and amended June 22, 2000.
- (b) Policy: Naming Chairs and Professorships, approved January 6, 1982 and amended September 6, 1990.

6.0 Cross References

Cross References

[Indicate names and numbers of other specific Governing Documents which should be cross referenced to this Governing Document. Include section # of other Governing Documents if appropriate.]

Cross referenced to: (1) Policy: Chairs and Professorships (3) _____

(2) _____ (4) _____

Errata to: Report of the Senate Committee on Curriculum and Course Changes – Part A - Submitted to Senate for Concurrence Without Debate

Faculty of Science

Biotechnology Program

Program modification:

The Program is proposing the restructuring of the Honours program to introduce three streams: Analytical Biotechnology, Environmental (Biosystems) Biotechnology, and Molecular Biotechnology, to increase the flexibility of the program. In addition, a cooperative education option is proposed.

**BIOTECHNOLOGY PROGRAM
Program Changes
2009-2010**

Current Honours Degree:

Microbiology – Chemistry Joint Program in Biotechnology, Department Code: 060T			
UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT (comprising courses listed in chart below, and electives)			
BIOL 1020, BIOL 1030, CHEM 1300, CHEM 1310, PHYS 1050 and PHYS 1070 (or PHYS 1020 and PHYS 1030), MATH 1500 and MATH 1700 (or MATH 1690)	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, MBIO/CHEM 2360, MBIO/CHEM 2370, MBIO 2100, MBIO 2110, MBIO 2280, BOTN 2460	CHEM 2380, CHEM 2470, CHEM 3390, MBIO 3410, MBIO 3440, MBIO 3470, PLNT 4330 Plus 9 credit hours from option list.	CHEM 3590, CHEM 4590, CHEM 4620 or CHEM 4630, MBIO 4470, MBIO 4510, MBIO 4570, MBIO 4600, MBIO 4610 Plus 6 credit hours from option list.
Plus 6 credit hours from the Faculty of Arts, which should include the required "W" course			
30 Hours	30 Hours	30 Hours	30 Hours
NOTE: MATH 1510, 1520 or 1530 may be used in place of MATH 1500; MATH 1710 may be used in place of MATH 1710; MATH 1690 may be used in place of MATH 1500 and 1700.			

BIOTECHNOLOGY PROGRAM
Program Changes
2009-2010

Proposed Honours Degree:

Microbiology – Chemistry Joint Program in Biotechnology, Department Code: 060T			
UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT (comprising courses listed in chart below, and electives)			
BIOL 1020 (C+), BIOL 1030 (B) CHEM 1300 (C+), CHEM 1310 (B), PHYS 1020 OR 1050 (C+), MATH 1500 (C+), STAT 1000 (C+)	CHEM 2210, CHEM 2220, MBIO/CHEM 2360, MBIO/CHEM 2370, MBIO 2100, CHEM 2470, BOTN 2460, ZOOL 2280	CHEM 3590, MBIO 3410, PLNT 2530, MBIO 3000	MBIO 4510, CHEM 4630, ZOOL 4140, BIOL 4610, BTEC 4000 PLNT 4610
Plus 6 credit hours from the Faculty of Arts which should include the required "W" course. Plus sufficient credit hours of electives to total 30 hours.	PLUS PROGRAM STREAM COURSES. Plus sufficient credit hours of electives to total 30 hours.	PLUS PROGRAM STREAM COURSES Plus sufficient credit hours of electives to total 30 hours.	PLUS PROGRAM STREAM COURSES Plus sufficient credit hours of electives to total 30 hours.
30 Hours	30 Hours	30 Hours	30 Hours

NOTE:

MATH 1510 or 1520 may be used in place of MATH 1500; MATH 1710 may be used in place of MATH 1700.

Program Stream courses:

Analytical Biotechnology

MATH 1700, CHEM 4370, CHEM 4590, CHEM 4670, CHEM 4700

Environmental Biotechnology

MATH 1700, BIOE 3530, BIOE 4510, BIOE 3200, MBIO 4672

Molecular Biotechnology

MBIO 2110, BOTN 4460, MBIO 4600, MBIO 4610, MBIO 4672

Recommended Minors:

Management (I.H. Asper School of Business)

Animal Systems (Faculty of Agricultural and Food Sciences)

Food Science (Faculty of Agricultural and Food Sciences)

Plant Biotechnology (Faculty of Agricultural and Food Sciences)

Human Nutrition and Metabolism (Faculty of Human Ecology)

Recommended Elective courses:

All courses in above Minors. All prerequisites as required.

Botany: BOTN 1010, BOTN 2010, BOTN/ZOOL 2180, BOTN 2210, BOTN/ZOOL 2370, BOTN 3190, BOTN 3280, BOTN 3460, BOTN 4180, BOTN 4460

Chemistry: CHEM 4360, CHEM 4370, CHEM 4590, CHEM 4620, CHEM 4670, CHEM 4700

Computer Science: COMP 1010, COMP 1020, COMP 1260, COMP 1270

Engineering: ENG 1420, BIOE 3530, BIOE 4510, BIOE 3200

Management: ENTR 2020

Mathematics: MATH 1700

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Microbiology: MBIO 2110, MBIO 2280, MBIO 3010, MBIO 3430, MBIO 3440, MBIO 3450, MBIO 3460, MBIO 3470, MBIO 3480, MBIO 4010, MBIO 4410, MBIO 4470, MBIO 4540, MBIO 4600, MBIO 4610, MBIO 4672

Pharmacology: PHAC 4030, PHAC 4040

Philosophy: PHIL 2740, PHIL 2830

Plant Science: PLNT 3140, PLNT 3500, PLNT 3520, PLNT 3570, PLNT 4330, PLNT 4540, PLNT 4550, PLNT 4560, PLNT 4570, PLNT 4580, PLNT 4590, PLNT 4600

Statistics: STAT 2000

Zoology: ZOOL 2150, ZOOL 3070, ZOOL 4150

The Changes are:

1. PHYS 1070 (PHYS 1030) is no longer required in Year I.
2. MATH 1700 is no longer required in Year I.
3. CHEM 2280 and CHEM 2290 are no longer Year II requirements.
4. MBIO 2110 is no longer a Year II requirement.
5. CHEM 2470 has been moved from Year III to the Year II requirements.
6. Introduction of program streams that students commence in Year II and complete in years III and IV.
7. CHEM 238 and CHEM 3390 are no longer Year III requirements.
8. MBIO 3440 and MBIO 3470 are no longer Year III requirements.
9. PLNT 4330 is no longer a Year III requirement.
10. PLNT 2530 and MBIO 3000 have been added to the Year III requirements.
11. CHEM 3590 has been moved from Year IV to Year III.
12. CHEM 4590, CHEM 462, MBIO 4470, MBIO 4570, MBIO 4600, MBIO 4610 removed from the list of Year IV requirements.
13. ZOOL 4140, BIOL 4610, BTEC 4000, and PLNT 4610 added to the list of year IV requirements.