

A G E N D A

**I CANDIDATES FOR DEGREES,
DIPLOMAS AND CERTIFICATES – MAY 2015**

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**II REPORT ON MEDALS AND PRIZES
TO BE AWARDED AT THE SPRING CONVOCATION**

This report will be available at the front table in the Senate Chamber for examination by members of Senate.

III MATTERS TO BE CONSIDERED IN CLOSED SESSION

1. **Report of the Senate Committee on Honorary Degrees
[March 19, 2015]**
2. **Report of the Senate Committee on Honorary Degrees
[April 28, 2015]**

The reports will be distributed to members of Senate at the meeting.
Documentation will be available for examination by eligible members of Senate the day preceding the Senate meeting in the Office of the University Secretary.

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Dr. Rozovsky's curriculum vitae will be available for inspection by members of Senate in the Office of the University Secretary and in the Dean's Office, College of Medicine, prior to the May Senate meeting.

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7. **Report of the Senate Committee on University Research
RE: Periodic Review of Research Centres and Institutes:
University of Manitoba Transport Institute**

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XIII **ADDITIONAL BUSINESS** - none

XIV **ADJOURNMENT**

Please send regrets to shannon.coyston@umanitoba.ca or call to 204-474-6892.

CANDIDATES FOR DEGREES, DIPLOMAS AND CERTIFICATES

1. Degrees Notwithstanding a Deficiency

A list of students to be considered for degrees notwithstanding a deficiency will be distributed at the meeting.

Deans and Directors should note that they may be asked to explain the circumstances leading to the recommendations from their respective Faculties or Schools.

At the conclusion of discussion of the report, the Speaker of the Senate Executive Committee will make the appropriate motion(s).

2. Report of the Senate Committee on Appeals

An oral report will be presented to Senate by the Chair of the Committee only if the Committee has heard an appeal which will result in the recommendation of the award of a degree notwithstanding a deficiency.

3. List of Graduands

A list of graduands will be provided to the University Secretary on the day of the meeting. The list will not be distributed to members of Senate but will be open for inspection by individual members of Senate.

The list to be provided to the University Secretary will be a compilation of the lists of the graduands of each Faculty and School.

The Speaker for the Senate Executive Committee will make the appropriate motion approving the list of graduands, subject to the right of Deans and Directors to initiate late changes with the Registrar up to May 15, 2015.

Election of Senate Representatives to the Board of Governors

1. General

- (a) The procedures to be followed for the election of members of Senate to the Board of Governors can be found on the web at:

http://umanitoba.ca/admin/governance/governing_documents/governance/senate_rules/524.htm

- (b) Among the more important procedures are the procedures governing nominations, the means of balloting, and the procedures to be followed in the event of a tie vote;
- (c) Special attention is directed to Point 3, which reads in part "... If the person nominated is not present, the nominator must state that the person nominated has consented to the nomination."

2. Election of Senate Representatives to the Board of Governors

- (a) The following resolution was approved by Senate on June 4, 1997: *"That Senate rescind its resolution of March 9, 1976 reserving one of its seats on the Board of Governors for a student Senator."*
- (b) The following resolution was approved by Senate on June 4, 1997: *"That in the future, as openings occur, Senate assure itself that at least one of the three individuals who represent it on the Board of Governors has no administrative responsibilities greater than those of department head at the time of election."*
- (c) Members-at-Large

According to Section 27(4) of *The University of Manitoba Act* (the "Act"), a member of Senate elected by a faculty or school council, who has been subsequently elected by Senate to the Board and whose term of office on Senate expires before his or her term of office on the Board, shall be appointed by Senate to be a member-at-large of Senate for the remainder of his or her term on the Board unless re-elected to Senate.

- (d) Students and *Ex-Officio* Members

Students and *ex-officio* members who are elected to represent Senate on the Board of Governors, but whose membership on Senate expires prior to their membership on the Board, are dealt with under the terms of the Act (Section 10(2)).

Pursuant to Section 10(2) of the Act, the Senate Executive Committee shall bring to Senate a motion to grant assessor status on Senate for a student or *ex-officio* member of Senate who was elected to represent Senate on the Board of Governors and whose term on Senate has expired prior to the person's term on the Board. Should such a motion fail, a motion to terminate the membership on the Board of Governors as a Senate representative shall be adopted.

3.
 - (a) One member of Senate is to be elected by Senate to the Board of Governors for a three-year term (June 1, 2015 to May 31, 2018) to replace Dr. Joanne Embree, whose term on the Board of Governors expires on May 31, 2015. Dr. Embree is not eligible for re-election as her term on Senate has ended;
 - (b) Current Senate representatives on the Board of Governors are:

Dr. Joanne Embree	(Medicine)	2015
Dean Norm Halden	(Environment, Earth & Resources)	2016
Dean Jeffery Taylor	(Arts)	2017
 - (c) Not eligible for election are the Chancellor, the President, and the Board of Governors' representatives on Senate. In accordance with the resolution noted in 2(b) above, the individual should not have administrative responsibilities greater than those of department head at the time of election.
4. Procedures
 - (a) Nominations for the position shall be received from the floor;
 - (b) Senators shall vote for no more than one candidate on the ballot provided;
 - (c) The candidate receiving the largest number of votes shall be declared elected for a three-year term;
 - (d) In the event of a tie, the question shall be resolved by another ballot involving those candidates who have tied.

Election of Senate Representatives to the Senate Executive Committee

1. Subsection 34(1) of *The University of Manitoba Act* provides that:

The senate has general charge of all matters of an academic character; and, without restricting the generality of the foregoing, the senate shall ...

- (y) elect an executive committee, which shall include
 - (i) the president, who shall be chairman of the committee;
 - (ii) the member of the senate designated by the president to be vice-chairman of the committee;
 - (iii) three members of senate from among the vice-presidents of the university, the deans of faculties and directors of schools;
 - (iv) a member of the board who has been appointed to be a member of the senate;
 - (v) a member elected by the students to be a member of senate;
 - (vi) eight other members of the senate from those elected under section 27 [i.e., elected by faculty/school councils];

2. Five Senators elected by faculty/school councils are to be elected as follows:

- (a) four Senators for three-year terms (June 1, 2015 to May 31, 2018) to replace Professors Mary Brabston, Emily Etcheverry, Diana McMillan and Brenda Austin-Smith, whose terms on the Senate Executive Committee expire on May 31, 2015;
- (b) one Senator for a two-year term (June 1, 2015 to May 31, 2017) to replace Professor Tammy Ivanco for the remainder of her term on the Senate Executive Committee, which expires on May 31, 2017, as she will no longer be a Senate member;
- (c) eligible for election are members of Senate elected by faculty/school councils;
- (d) presently serving:

Prof. Mary Brabston	Management	2015
Prof. Emily Etcheverry	Health Sciences	2015
Prof. Diana McMillan	Health Sciences	2015
Prof. Brenda Austin-Smith	Arts	2015
Prof. John Anderson	Science	2016
Prof. Judith Anderson	Science	2016
Prof. Tina Chen	Arts	2017
Prof. Tammy Ivanco	Arts	2017

3.
 - (a) One representative is to be elected from among the Vice-Presidents, Deans of Faculties and Directors of Schools, to be elected for a three-year term (June 1, 2015 to May 31, 2018) to replace Dean Jeffery Taylor. Dean Taylor is eligible for re-election;
 - (b) Eligible for election are:
 - (i) Vice-Presidents: P. Kochan, J. Kearsey and D. Jayas
 - (ii) Deans/Directors: K. Wittenberg, R. Stern, N. Halden, D. Mandzuk, J. Beddoes, B. Postl, H. Frankel, M. Benarroch, D. Brown, L. Turnbull, E. Dawe, S. Baum, J. Mulvale, G. Hepburn
 - (c) Presently serving:

Dean Jeffery Taylor	Arts	2015
Prof. Paul Hess	School of Art	2016
Dr. Jay Doering	Graduate Studies	2017
4. Procedures:
 - (a) Nominations for the positions shall be received from the floor.
 - (b) Senators shall vote for no more than five candidates in category 1, and one candidate in category 2 on the ballot provided.
 - (c) The candidates receiving the largest number of votes shall be elected.
 - (d) In the event of a tie, the question shall be resolved by another ballot involving those candidates who have tied.

Election of a Student Senator to the Senate Executive Committee

1. The composition of the Senate Executive Committee makes provision for three student assessors. The Assessors are as follows:
 - (a) President of UMSU (or designate) term: May 1, 2015 - April 30, 2016
 - (b) President of GSA (or designate) term: May 1, 2015 - April 30, 2016
 - (c) Student Senator appointed
by caucus of Student Senators term: May 1, 2015 - April 30, 2016
2. The composition of the Senate Executive Committee also makes provision for one elected Student member of Senate. A candidate for this position is nominated by the caucus of Student Senators at Senate. The term for this position is May 1, 2015 - April 30, 2016.
3. Procedures:
 - (a) A nomination for the position shall be provided by the Student Senate Caucus;
 - (b) Senators shall vote by a show of hands.

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 March 11, 25, and 26, 2015 and on April 1 and 2, 2015, and participated in two electronic polls (dated April 16 – 20 and May 1 – 6), to consider curriculum and course changes from Faculties, Colleges, and Schools.
3. The Report outlines course and curriculum changes endorsed by the SCCCC at the meetings noted above. It also includes a number of items that were endorsed in the Fall 2014, pending approval of course changes being considered by the Department of Mathematics for the Spring 2015. The dates on which particular items were endorsed by the SCCCC last Fall are noted below in the observations.
4. Proposed course deletions, introductions, and modifications, and program modifications are described in detail in the attachment to the Report.

Observations:

1. **General**

In keeping with past practice, most changes for departments totalling 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. The committee approved the Senate Committee on Curriculum and Course Changes – 2015/2016 Timetable for Faculty/School Submissions to the Office of the University Secretary.

3. **Courses Recommended for the Written English Requirement**

GRMN 1120 Beginning German A (6); GRMN 2100 Intermediate German (A) (6); GRMN 2140 Exploring German Literature (B) (3)

4. **Faculty of Agricultural and Food Sciences**

Human Nutritional Sciences

The department is proposing the introduction of one (1) course. The overall number of credit hours offered by the department would increase by two (2) credit hours.

Plant Science

The department is proposing a program modification to the **Minor in Crop Protection**, to add PLNT 3520 Principles of Plant Improvement to the list of courses that can be completed toward the Minor.

Faculty of Agricultural and Food Sciences

The faculty is proposing a program modification to the **Bachelor of Science in Agriculture (Agronomy)**, to remove GEOG 2250 Introduction to Geographic Information Systems from the list of Group 4 Restricted Electives.

5. **School of Art**

The school is proposing the modification of four (4) courses. There would be no change to the overall number of credit hours offered by the school.

6. **Faculty of Arts**

Asian Studies

The program is proposing a modification to List A Courses Acceptable for Asian Studies Credit, to include FAAH 1100. The changes relate to the following programs:

- **Bachelor of Arts (General Major) in Asian Studies**
- **Minor (Concentration) in Asian Studies**

Canadian Studies

The program is proposing a modification to the List of Approved Courses in Canadian Studies, to indicate that GEOG 3480 and GEOG 3900 are no longer offered. The changes relate to the following programs:

- **Bachelor of Arts (General Major) in Canadian Studies**
- **Bachelor of Arts (Single Honours) in Canadian Studies**
- **Bachelor of Arts (Double Honours) in Canadian Studies**
- **Minor (Concentration) in Canadian Studies**

Classics

The department is proposing the introduction of one (1) course. The overall number of credit hours offered by the department would increase by three (3) credit hours.

Economics

The department is proposing the modification of four (4) courses. There would be no change to the overall number of credit hours in course offerings.

The department is proposing program modifications to the following programs:

- **Bachelor of Arts (Joint Honours) in Economics – Mathematics** (Endorsed by the SCCCC at its meeting on October 16, 2014.)
- **Bachelor of Arts (Joint Honours) in Economics – Statistics**
- Program Notes

French, Spanish, and Italian

The department is proposing the introduction of two (2) courses and the modification of one (1) course. The overall number of credit hours offered by the department would increase by six (6) credit hours.

German and Slavic Studies

The department is proposing the modification of six (6) courses. There would be no change to the overall number of credit hours in course offerings.

Global Political Economy

The program is proposing the modification of two (2) courses. There would be no change to the overall number of credit hours in course offerings.

The program is proposing modifications to the following programs, to allow GEOG 1700 to be used in place of GPE 1700 for admission to the programs:

- **Bachelor of Arts (General Major) in Global Political Economy**
- **Bachelor of Arts (Single Advanced Major) in Global Political Economy**

List A, which describes courses acceptable for credit in these programs, will be modified to include SOC 2240 – Sociology of Globalization (3).

Judaic Studies

The program is proposing modifications to the **Minor (Concentration) in Judaic Studies**, involving a change to List A Courses Acceptable for Judaic Studies Credit, to include RLGN 3810 The Talmud. The changes relate to the following programs:

Psychology

The department is proposing the deletion of one (1) course and the introduction of one (1) course. There would be no change to the overall number of credit hours in course offerings.

Sociology

The department is proposing the modification of one (1) course. There would be no change to the overall number of credit hours in course offerings.

Faculty of Arts

The faculty is proposing a program modification to the **Interfaculty Option in Aging Concentration**, to include PSYC 2490 – Abnormal Development (3) and SOC 2310 – Selected Problems (3), which would be acceptable for credit when the topic is “Canadian Social Issues”.

The faculty is proposing program modifications to the following programs:

- **Bachelor of Arts (General Major) in Mathematics**
- **Bachelor of Arts (Single Advanced Major) in Mathematics**
- **Minor in Mathematics**
- Program Notes

7. School of Dental Hygiene

The school is proposing one (1) course modification. There would be no change to the overall number of credit hours in course offerings.

8. College of Dentistry

The college is proposing the deletion of 58 courses totaling 369.0 credit hours across all departments. The course deletions follow from the implementation of a revised curriculum for the Doctor of Dental Medicine (D.M.D.) program over the last several years, beginning in the Fall 2011. Courses to be deleted are no longer required by any students admitted to program prior to 2011, who completed the previous curriculum.

General Dentistry

The college is proposing the deletion of four (4) General Dentistry courses, which would result in a reduction of 48.0 credit hours of courses.

Dental Diagnostic and Surgical Sciences

The department is proposing the deletion of fifteen (15) courses. The overall number of credit hours offered by the department would decrease by 90.0 credit hours.

Oral Biology

The department is proposing the deletion of eleven (11) courses and the modification of one (1) course. The overall number of credit hours offered by the department would decrease by 66.0 credit hours.

Preventive Dental Science

The department is proposing the deletion of ten (10) courses. The overall number of credit hours offered by the department would decrease by 60.0 credit hours.

Restorative Dentistry

The department is proposing the deletion of eighteen (18) courses. The overall number of credit hours offered by the department would decrease by 105.0 credit hours.

9. **Faculty of Education**

Educational Administration, Foundations and Psychology

The department is proposing a program modification for the **Post-Baccalaureate Diploma in Education** to limit the number of credit hours that can be earned through approved external field-led courses to a maximum of six (6) credit hours.

10. **Faculty of Engineering**

Biosystems Engineering

The department is proposing the introduction of one (1) course. The overall number of credit hours offered by the department would increase by 3 credit hours.

The department is proposing a program modification to the **Bachelor of Science in Engineering (Biosystems Engineering)** program, to add BIOE 2480 Impact of Engineering on Society to the list of core courses and to remove CIVL 3710 Finite Element Analysis from that list.

Civil Engineering

The department is proposing the modification of one (1) course. There would be no change to the overall number of credit hours in course offerings.

The department is proposing a program modification to the **Bachelor of Science in Engineering (Civil Engineering)** program that follows from the deletion of ENG 2010 and the introduction of ENG 2030 and ENG 2040.

Electrical and Computer Engineering

The department is proposing the modification of one (1) course. There would be no change to the overall number of credit hours in course offerings.

The department is proposing program modifications to the **Bachelor of Science in Engineering (Computer Engineering)** that follow from the deletion of ENG 2010 and the introduction of ENG 2030 and ENG 2040.

The department is proposing a program modification to the **Bachelor of Science in Engineering (Electrical Engineering)** involving changes to the courses included in

Group B Technical Elective Courses. Other modifications follow from the deletion of ENG 2010 and the introduction of ENG 2030 and ENG 2040.

Mechanical Engineering

The department is proposing program modifications to the **Bachelor of Science in Engineering (Mechanical Engineering)** that follow from the deletion of ENG 2010 and the introduction of ENG 2030 and ENG 2040.

Faculty of Engineering

The faculty is proposing the deletion of one (1) course, the introduction of two (2) courses, and the modification of four (4) courses. The overall number of credit hours offered by the faculty would increase by 3 credit hours.

The faculty is proposing a modification to the **Preliminary Engineering Program**, to replace a requirement for ENLG 1310 – Literary Topics 1 with ENGL 1400 Thematic Approaches to the Study of Literature (or equivalent).

11. Faculty of Environment, Earth, and Resources

Environment and Geography

The department is proposing the deletion of fifteen (15) courses, the introduction of five (5) courses, and the modification of five (5) courses. The overall number of credit hours offered by the department would decrease by forty-eight (48) credit hours

The department is proposing program modifications to the following programs:

- **Bachelor of Arts (Honours) in Geography**
- **Bachelor of Arts (Advanced) in Geography**
- **Bachelor of Arts (General) in Geography**
- **Minor in Geography**
- **Bachelor of Science (Honours) in Physical Geography**
- **Bachelor of Science (Honours) in Physical Geography, Cooperative Option**
- **Bachelor of Science (Major) in Physical Geography**
- **Bachelor of Science (Major) in Physical Geography, Cooperative Option**

Geological Sciences

The department is proposing a modification to List B Geological Sciences – Geology Electives. The changes relate to the following programs:

- **Bachelor of Science (Honours) in Geological Sciences - Geology**
- **Bachelor of Science (Major) in Geological Sciences - Geology**

The department is proposing a modification to List B Geological Sciences – Geophysics Electives. The changes relate to the following programs:

- **Bachelor of Science (Honours) in Geological Sciences - Geophysics**
- **Bachelor of Science (Major) in Geological Sciences - Geophysics**

12. **Extended Education Division**

The division is proposing program modifications to the **Aboriginal Environmental Stewardship Diploma** involving changes to the required and elective courses.

13. **Faculty of Management**

Accounting and Finance

The department is proposing to introduce two (2) courses. The overall number of credit hours offered by the college would increase by six (6) credit hours.

The department is proposing program modifications to the **Bachelor of Commerce (Honours), Finance Major**.

Actuarial Mathematics

The program is proposing two (2) course modifications. There would be no change to the overall number of credit hours in course offerings.

The program is proposing program modifications to the **Bachelor of Commerce (Honours), Actuarial Mathematics Major**.

Faculty of Management

The faculty is proposing modifications to the Alternative Management Studies requirement for the **Bachelor of Commerce (Honours)** degree.

14. **College of Nursing**

The college is proposing a program modification to the **Bachelor of Nursing** program. HNSC 1210 Nutrition for Health and Changing Lifestyles (3) is to be removed from the requirements for Year 2. It would be replaced with HNSC 2710 Nutrition for Health Professionals (2).

15. **College of Pharmacy**

The college is proposing the deletion of two (2) courses and the introduction of one (1) course. The overall number of credit hours offered by the college would decrease by two (2) credit hours.

The college is proposing modifications to Year 2 of the **Bachelor of Science in Pharmacy** that follow from the course deletions and introduction. In particular, PHRM 2420 Applied Nutrition would be deleted and replaced in the curriculum with HNSC 2170 Nutrition for Health Professionals. The latter course has been developed to provide education in nutrition that is specific to the health professions. Nutrition content from PHRM 2420 that is specific to the discipline of Pharmacy would be redistributed to the

proposed PHRM 2320 Clinical Pharmacy 1 (5), which would replace the PHRM 2310 Clinical Pharmacy 1 (4).

16. **Faculty of Science**

Faculty of Science

The faculty is proposing modifications to the general Academic Regulations for the **Bachelor of Science (General)** programs, including changes to the list of courses in Group A, to include new 1000- level Mathematics courses.

Actuarial Mathematics

The program is proposing a number of program modifications to the **Bachelor of Science (Honours) in Actuarial Mathematics**, including, among others, changes to the 1000-level Mathematics courses required to enter the program that follow from revisions to Mathematics course offerings.

Biochemistry

The department is proposing program modifications to the following programs:

- **Bachelor of Science (Honours) in Biochemistry**
- **Bachelor of Science (Honours) in Biochemistry, Cooperative Option**
- **Bachelor of Science (Major) in Biochemistry**
- **Bachelor of Science (Major) in Biochemistry, Cooperative Option**
- Chemistry and Microbiology Option Courses for Biochemistry Honours Students

Proposed modifications involve a change to the Chemistry courses included on the list of Chemistry and Microbiology Option Courses for Biochemistry Honours Students and changes to Note 1 to indicate that new 1000-level Mathematics courses, MATH 1230 and MATH 1232, may be completed in place of MATH 1500 and MATH 1700, respectively.

Biological Sciences

The department is proposing the modification of one (1) course. There would be no change to the overall number of credit hours in course offerings.

The department is proposing program modifications to the following programs, including all of the Theme Areas:

- **Bachelor of Science (Honours) in Biological Sciences**
- **Bachelor of Science (Honours) in Biological Sciences, Cooperative Option**
- **Bachelor of Science (Major) in Biological Sciences**
- **Bachelor of Science (Major) in Biological Sciences, Cooperative Option**

Proposed modifications involve changes to the Note 1, for each of the programs (as appropriate), to indicate that new 1000-level Mathematics courses, MATH 1220, MATH 1230, and MATH 1240, may be completed in place of MATH 1300, MATH 1500, and MATH 1200, respectively. Note 4 has been added to the program chart for the Cell,

Molecular, Developmental Theme, to indicate that the former BIOL 2450 may be used in place of BIOL 3542.

The department is proposing changes to the **Bachelor of Science (General) in Biological Sciences** to remove a number of Notes that do not apply to the program.

Biotechnology

The program is proposing program modifications to the following programs:

- **Bachelor of Science (Joint Honours) in Biotechnology**
- **Bachelor of Science (Joint Honours) in Biotechnology, Cooperative Option**
- **Bachelor of Science (Joint Major) in Biotechnology**
- **Bachelor of Science (Joint Major) in Biotechnology, Cooperative Option**

The program is proposing changes to: required courses in Years 3 and 4 of the program; courses included in the list of Recommended General Electives; courses required for the Molecular Biotechnology Stream; Note 1, to indicate that new 1000-level Mathematics courses, MATH 1230 and MATH 1232, may be completed in place of MATH 1500 and [MATH 1500 and MATH 1700], respectively.

Chemistry

The department is proposing the modification of one (1) course. There would be no change to the overall number of credit hours in course offerings.

The department is proposing modifications to the following programs:

- **Bachelor of Science (Honours) in Chemistry**
- **Bachelor of Science (Honours) in Chemistry, Cooperative Option**
- **Bachelor of Science (Major) in Chemistry**
- **Bachelor of Science (Major) in Chemistry, Cooperative Option**
- **Bachelor of Science (General) in Chemistry**
- **Minor in Chemistry**
- **Bachelor of Science (Joint Honours) in Chemistry and Physics and Astronomy**

The department is proposing, among other changes, to revise Note 1, for the Honours, Major, and General programs in Chemistry, and the Joint Honours in Physics and Chemistry, to indicate that new 1000-level Mathematics courses, MATH 1230 and MATH 1232, may be completed in place of MATH 1500 and MATH 1700, respectively.

The department is proposing changes to the list of required courses for the **Physical Chemistry Focus Area**, to reflect proposed changes to Mathematics courses, and to include additional Chemistry courses.

Computer Science

The department is proposing modifications to five (5) courses. There would be no change to the overall number of credit hours in course offerings.

The department is proposing modifications to the following programs:

- **Bachelor of Science (Honours) in Computer Science**
- **Bachelor of Science (Honours) in Computer Science, Cooperative Option**
- **Bachelor of Science (Major) in Computer Science**
- **Bachelor of Science (Major) in Computer Science, Cooperative Option**
- **Bachelor of Science (Joint Honours) in Computer Science – Physics and Astronomy**
- **Bachelor of Science (Joint Honours) in Computer Science – Physics and Astronomy, Cooperative Option**

Proposed modifications involve changes to the Note 1, for each of the programs (as appropriate), to indicate that new 1000-level Mathematics courses, MATH 1220, MATH 1230, and MATH 1232, may be completed in place of MATH 1300, MATH 1500, and [MATH 1500 and MATH 1700], respectively.

- **Bachelor of Science (Joint Honours) in Computer Science – Statistics**
- **Bachelor of Science (Joint Honours) in Computer Science – Statistics, Cooperative Option**

The Mathematics course requirements in Years 1 and 2 of the programs have been updated to reflect course changes proposed by the Department of Mathematics.

Genetics

The program is proposing program modifications to the following programs:

- **Bachelor of Science (Honours) in Genetics**
- **Bachelor of Science (Honours) in Genetics, Cooperative Option**
- **Bachelor of Science (Major) in Genetics**
- **Bachelor of Science (Major) in Genetics, Cooperative Option**

Proposed modifications involve changes to the Note 1, to indicate that new 1000-level Mathematics courses, MATH 1220, MATH 1230, MATH 1232, and MATH 1240 may be completed in place of MATH 1300, MATH 1500, [MATH 1500 and MATH 1700], and MATH 1200, respectively. BIOL 3542 will be added to the list of optional courses in Biological Sciences.

Microbiology

The department is proposing program modifications to the following programs:

- **Bachelor of Science (Honours) in Microbiology**
- **Bachelor of Science (Major) in Microbiology**

Physics and Astronomy

The department is proposing the modification of nine (9) courses. There would be no change to the overall number of credit hours in course offerings.

The department is proposing program modifications to the following programs:

- **Bachelor of Science (Honours) in Physics and Astronomy, Options A, B, C**
- **Bachelor of Science (Major) in Physics and Astronomy**

Statistics

The department is proposing the modification of six (6) courses. There would be no change to the overall number of credit hours in course offerings. (Modifications to STAT 2220, STAT 2400, STAT 3800, and STAT 4690 were endorsed by SCCCC in an electronic poll dated November 7, 2014.)

The department is proposing program modifications to the following programs:

- **Bachelor of Science (Major) in Statistics**
- **Bachelor of Science (Major) in Statistics, Cooperative Option**
- **Bachelor of Science (Honours) in Statistics**
- **Bachelor of Science (Honours) in Statistics, Cooperative Option**
- **Bachelor of Science (Joint Honours) in Statistics and Actuarial Mathematics**
- **Bachelor of Science (Joint Honours) in Statistics and Economics**

17. Université de Saint-Boniface

Faculty of Arts

English

The department is proposing the modification of one (1) course.

German

The department is proposing the deletion of one (1) course and the introduction of two (2) courses.

Philosophy

The department is proposing the introduction of (1) course.

Political Science

The department is proposing the modification of one (1) course.

Faculty of Education

The faculty is proposing the introduction of one (1) course.

Faculty of Science

Chemistry

The department is proposing the modification of one (1) course.

Microbiology

The department is proposing the modification of one (1) course.

School of Social Work

The school is proposing the introduction of one (1) course.

Recommendation

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

Faculty of Agricultural and Food Sciences

School of Art

Faculty of Arts

School of Dental Hygiene

College of Dentistry

Faculty of Education

Faculty of Engineering

Faculty of Environment, Earth, and Resources

Extended Education Division

Faculty of Management (I.H. Asper School of Business)

College of Nursing

College of Pharmacy

Faculty of Science

Université de Saint-Boniface

Respectfully submitted,

Professor G. Smith, Acting Chair
Senate Committee on Curriculum and Course Changes

SENATE COMMITTEE ON CURRICULUM AND COURSE CHANGES – 2015/2016

TIMETABLE FOR FACULTY/COLLEGE/SCHOOL SUBMISSIONS to the Office of the University Secretary

	Fall Deadline	SPPC Meeting	Spring Deadline	Senate Executive Meeting	Senate Meeting
Curriculum/Course changes < 9 CH	September 11, 2015 <i>Submitted to SCCCC only</i>			November 18, 2015	December 2, 2015
Curriculum/Course changes > 9 CH or with resource implications	August 17, 2015 <i>Submitted to SCCCC and SPPC</i>	September 31, 2015		November 18, 2015	December 2, 2015
Curriculum/Course changes			February 12, 2016	May 1, 2016	May 18, 2016

Note:

1. All changes with resource implications must be considered by the Senate Planning and Priorities Committee (SPPC). Faculties/Colleges/Schools should provide a separate submission for SPPC.

Resource Implications include: (i) additions/deletions of courses in a department with a net increase of more than nine credit hours, submission to SPPC should include how this will be addressed; (ii) if course is offered jointly with other faculty(s) what are the resource implications.
2. Proposals for course deletions or modifications (including changes to pre- or corequisites) that would impact other courses/programs, including courses/programs in other units, should, **ideally**, be brought forward for the Fall deadline. Academic units initiating such changes are **required** to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCCC for the same Fall deadline, **ideally**, or the next ensuing Spring deadline. The Registrar's Office can assist units in identifying other courses/programs affected by a proposed course modification/deletion where an academic unit does not have this information.
3. The submission of *new* undergraduate programs and articulation agreements with or without additional funding will be considered on an on-going basis by SCCCC and SPPC. In the fall, the Committee's focus is on course changes, therefore, new programs might not be dealt with as quickly as at other times of the year.

Faculty of Agricultural and Food Sciences

Human Nutritional Sciences

Introduction:

HNSC 2170 Nutrition for Health Professionals Cr.Hrs. 2 +2.0

An examination of the fundamentals of nutrition and the relationship between nutrition and health within the context of the health professions. The focus is on nutritional strategies used to promote health and in the treatment of common health conditions. May not be held with HYG 2370, the former ORLB 2150, ORLB 2330, or the former PHRM 2420. This course is restricted to students registered in Nursing or Pharmacy.

NET CHANGE IN CREDIT HOURS: +2.0

Plant Science

Program modification:

A modification to the **Minor in Crop Protection** is outlined on the next page.

Proposal to Add PLNT 3520 Principles of Plant Improvement to Crop Protection Minor

Students may obtain a minor in Crop Protection (18 credit hours) by completing ENTM 3170 Crop Protection Entomology or ENTM 3190 Introduction to Applied Entomology, PLNT 3540 Weed Science, PLNT 3570 Fundamentals of Plant Pathology, PLNT 4270 Plant Disease Control, plus 6 credit hours from the following list of courses: AGRI 2180 Introductory Toxicology, BIOE 4520 Crop Preservation and Handling, ENTM 2050 Introductory Entomology, PLNT 3510 Cropping Systems, PLNT 3520 Principles of Plant Improvement, PLNT 4570 Research Methods in Plant Pathology, PLNT 4580 Molecular Plant-Microbe Interactions, SOIL 3520 Pesticides: Environment, Economics and Ethics.

Added Material

Prescribed Crop Protection Minor:

Required courses:		
ENTM 3170	Crop Protection Entomology	
or		
ENTM 3190	Introduction to Applied Entomology	3
PLNT 3540	Weed Science	3
PLNT 3570	Fundamentals of Plant Pathology	3
PLNT 4270	Plant Disease Control	3
Plus 6 credit hours from the following:		
AGRI 2180	Introductory Toxicology	
BIOE 4520	Crop Preservation and Handling	
ENTM 2050	Introductory Entomology	
PLNT 3510	Cropping Systems	
<u>PLNT 3520</u>	<u>Principles of Plant Improvement</u>	
PLNT 4570	Research Methods in Plant Pathology	
PLNT 4580	Molecular Plant-Microbe Interactions	
SOIL 3520	Pesticides: Environment, Economics and Ethics	6
Total Credit Hours:		18

Faculty of Agricultural and Food Sciences

Program modification:

A modification to the **Bachelor of Science in Agriculture (Agronomy)** is outlined on the next page.

Proposal to Modify B.Sc. in Agriculture (Agronomy Program) Group 4 Restricted Elective Group

The Faculty of Environment, Earth, and Resources is proposing the deletion of GEOG 2250 Introduction to Geographic Information Systems. This course is one of the options for the Group 4 Restricted electives for the Agronomy Program. After consulting with the Agronomy Program Chair and Advisor it was clear this course is not often selected for the Group 4 restricted elective and deleting it from the options would not pose any issues. In addition, BIOE 2222 Precision Agriculture Concepts and Applications was recently approved by Senate to be added to this restricted elective group.

~~Deleted material~~

Prescribed Group 4 Restricted Elective Group:

Restricted Elective Group		
Group 4 – One course from the following:		
BIOE 2090	Machinery for Agricultural Production	
BIOE 4500	Water Management	
BIOE 4520	Crop Preservation and Handling	
GEOG 2250	Introduction to Geographic Information Systems	
BIOE 2222	Precision Agriculture Concepts and Applications	3

School of Art

Modifications:

STDO 2670 Design Theory and Criticism 1 Cr .Hrs. 3 0.0
(Formerly 054.267) An introduction to the nature of the design process and the principles of visual perception and visual language with a focus on the cultural and commercial roles of visual communication design practice. Prerequisite: Successful completion of 21 credit hours at 1000-level STDO courses and FAAH 1030 (or 054.103) and FAAH 1040 (or 054. 104).

STDO 3330 Advanced Drawing 2 Cr.Hrs. 6 0.0
An upper level drawing course with an emphasis on finished drawings and experimental techniques. Prerequisite: STDO 2250.

STDO 3830 Advanced Printmaking A Cr.Hrs. 3 0.0
(Formerly 054.383) An upper level print media course allowing students to develop work in one or more of the print processes. May not be held with the former 054.345 or 054.383.
Prerequisite: successful completion of a minimum of one of the following courses: STDO 2500, STDO 2502, STDO 2510, STDO 2515, STDO 2520, STDO 2522, or STDO 2530.

STDO 3840 Advanced Printmaking B Cr.Hrs. 3 0.0
(Formerly 054.384) An upper level print media course allowing students to develop work in one or more of the print processes. May not be held with the former 054.345 or 054.384.
Prerequisite: successful completion of STDO 3830 (or 054.383).

NET CHANGE IN CREDIT HOURS: 0.0

Faculty of Arts

Asian Studies

Program modification:

A modification to List A – Courses Acceptable for Asian Studies Credit is outlined on the pages that follow. The changes relate to the following programs:

- **Bachelor of Arts (General Major) in Asian Studies**
- **Minor (Concentration) in Asian Studies**

Asian Studies

- Modification of List A

Added material

Deleted material

List A	Courses Acceptable for Asian Studies	Credit	Credit Hours
Faculty of Arts			
Anthropology			
ANTH 2450	Ethnology of China		3
Asian Studies Asian Languages			
ASIA 1750	Introduction to Korean		6
ASIA 1760	Introduction to Chinese (Mandarin)		6
ASIA 1770	Introduction to Japanese		6
ASIA 1780	Basic Sanskrit		6
ASIA 1790	Basic Hindi-Urdu		6
ASIA 2340*	Special Studies in Epic and Pauranic Sanskrit 1		3
ASIA 2350*	Special Studies in Epic and Pauranic Sanskrit 2		3
ASIA 2360*	Mandarin Comprehension		6
ASIA 2750	Intermediate Korean		6
ASIA 2760	Intermediate Chinese (Mandarin)		6
ASIA 2770	Intermediate Japanese		6
ASIA 2780	Intermediate Sanskrit		6
ASIA 2790*	Intermediate Hindi-Urdu		6
ASIA 3660*	Advanced Mandarin Comprehension		6
ASIA 3750	Advanced Korean		6
ASIA 3760	Advanced Chinese (Mandarin)		6
ASIA 3770	Advanced Japanese		6
ASIA 3780	Advanced Reading in Japanese		3
ASIA 3790*	Advanced Hindi-Urdu		6
ASIA 3792	Linguistic Analysis of Japanese		3
Asian Studies Other Asian courses			
ASIA 1420	Asian Civilizations to 1500 (Same as HIST 1420)		3
ASIA 1430	Asian Civilizations from 1500 (Same as HIST 1430)		3
ASIA 2070*	South Asian Civilization		6
ASIA 2080	South Asian Civilization		3
ASIA 2570	History, Culture and Society in Chinese Film		3
ASIA 2580	Women in Chinese Film		3
ASIA 2600	Japanese Film		3
ASIA 2610	Modern Chinese Literature in Translation		3
ASIA 2620	Japanese Civilization		3
ASIA 2630	Chinese Civilization		3
ASIA 2650	Premodern Chinese Literature in Translation		3
ASIA 2660*	Modern Chinese Literature in Translation		6
ASIA 2662	Chinese Diaspora Literature		3
ASIA 2670	Modern Japanese Literature in Translation		3
ASIA 3480	Selected Topics in Asian Studies 1		3
ASIA 3490	Selected Topics in Asian Studies 2		3
ASIA 3520	The Japanese Theatre		3
ASIA 3560	Themes and Genres in Asian Literature		3
ASIA 3600	Japanese Popular Culture		3
ASIA 3650*	Masterpieces of Asian Literature		6
150.141*	Asian Civilizations (Same as HIST 1410)		6
150.211*	East Asian Civilization		6
English, Film, and Theatre			
FILM 2380	The International Cinema 1 [Acceptable for credit only when the topic is Asia related]		3
FILM 2390	The International Cinema 2 [Acceptable for credit only when the topic is Asia related]		3
History			
HIST 1410*	Asian Civilizations (Same as the former 150.141)		6
HIST 1420	Asian Civilizations to 1500 (Same as ASIA 1420)		3
HIST 1430	Asian Civilizations from 1500 (Same as ASIA 1430)		3
HIST 2050	South Asia Since 1947		3
HIST 2130	Emergence of Modern South Asia: 1757-1947		3
HIST 2410	History of India		6
HIST 2650	Modern China and Japan		6
HIST 2654	History of the People's Republic of China, 1949-Present		3
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 4070	Issues in Modern Asian History 1: Selected Topics (M,B)		3
HIST 4080*	Issues in Modern Asian History 2: Selected Topics (M,B)		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
Religion			
RLGN 1320	Introduction to World Religions		6
RLGN 1321*	Introduction aux religion du monde		6
RLGN 2010	Introduction to Hinduism		3
RLGN 2020	Introduction to Buddhism		3
RLGN 2540*	Modern Movements in World Religions		6
RLGN 2570	Indian Religious Art and Architecture		3
RLGN 2700	Religions of China and Japan		6
RLGN 3150	Buddhism in East Asia		3
RLGN 3160	Tibetan Religious Traditions		3
RLGN 3210	Indian Philosophy		3
RLGN 3220	Indian Religion and Society		3
RLGN 3260	Indian Buddhism		3
RLGN 3266	Readings in Buddhist Texts		3
RLGN 3270	Guru and Disciple		3
RLGN 3750	Topics in Indian Religious Art and Architecture		3
RLGN 4060	The Yoga Tradition		3
RLGN 4100	Advanced Studies in Buddhism		3
RLGN 4190	Advanced Studies in Hinduism		3
020.266*	Religions of Indian Origin		6
020.374*	Studies in Asian Religions		6
020.441*	Masters of Spiritual Life		6
020.445*	Topics in Comparative Religion		6
Sociology			
SOC 3690*	Sociology of the Developing Societies		3
School of Art			
FAAH 1100	Survey of Asian Art		3
FAAH 2100*	Survey of Asian Art		3

FAAH 3230	Chinese Art and Architecture	3
FAAH 3240	Japanese Art and Architecture	3
FAAH 3590	Islamic Art and Architecture	3
Clayton H. Riddell Faculty of Environment, Earth, and Resources		
Geography		
GEOG 2490*	Geography of Modern China	3
GEOG 3590	Geography of Developing Countries	6
* Indicates course no longer offered.		

Canadian Studies

Program modifications:

Modifications to the List of Approved Courses in Canadian Studies are outlined on the pages that follow. The changes relate to the following programs:

- **Bachelor of Arts (General Major) in Canadian Studies**
- **Bachelor of Arts (Single Honours) in Canadian Studies**
- **Bachelor of Arts (Double Honours) in Canadian Studies**
- **Minor (Concentration) in Canadian Studies**

Canadian Studies

- Modification of List of Approved Courses in Canadian Studies

Added material

Deleted material

List of Approved Courses in Canadian Studies

In the following list of approved courses the designation (H) indicates an Honours course. Courses designated (USB) are offered in French at Université 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
ANTH 2040	Native North America: A Sociocultural Survey (B)	3
ANTH 2041	Les Amérindiens de l'Amérique du nord: une étude socioculturelle (B) (USB)	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) (USB)	3
ANTH 3500	Peoples of the Arctic (B)	3
ANTH 3501	Peuples de l'Arctique (B) (USB)	3
ANTH 3550	Canadian Subcultures	3
ANTH 3551	Sous-cultures canadiennes (USB)	3
ANTH 3910	Archaeological Field Training (D,E)	6
ECON 1210	Introduction to Canadian Economic Issues and Policies	3
ECON 1211	Introduction aux politiques et aux problèmes économiques canadiens (USB)	3
ECON 2280*	Social Welfare and Human Resources	6
ECON 2310	Canadian Economic Problems	6
ECON 2311	Les problèmes économiques du Canada (USB)	6
ECON 2350	Community Economic Development	3
ECON 2360*	Women in the Canadian Economy	6
ECON 2362	Economics of Gender	3
ECON 3300*	Canadian Economic History	6
ECON 3301	Histoire économique du Canada (USB)	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
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 (USB)		
FRAN 2831	L'individu et le pays (USB)	3
FRAN 2881	Civilisation canadienne-française (USB)	3
FRAN 3531	Le théâtre québécois (USB)	3
FRAN 3541	Le théâtre de l'Ouest (USB)	3
FRAN 3831	L'époque de la contestation (USB)	3
FRAN 3841	La révolution tranquille et le roman (USB)	3
FRAN 3851	Le théâtre de l'Ouest: poésie, nouvelles (USB)	3
FRAN 3861	Le théâtre de l'Ouest: romans (USB)	3
FRAN 4831	Littérature de l'Acadie et des Cajuns (USB)	3
French, Spanish and Italian		
FREN 2700	Poésie et théâtre canadiens-français (B)	3
FREN 3140	Roman canadien-français (B)	3
FREN 3850	Civilisation canadienne-française (C)	3
044.247*	French-Canadian Literature in Translation	6
044.348*	Littérature canadienne-française (H)	3
044.353*	Littérature canadienne-française (B)	3
History		
HIST 1390	History of Colonial Canada: 1500-1885 (C)	3
HIST 1400	History of the Canadian Nation Since 1867 (C)	3
HIST 1440	History of Canada (C)	6
HIST 1441	Histoire du Canada (USB)	6
HIST 2191	Histoire économique et sociale canadienne du XIXe siècle (USB)	6
HIST 2280	Aboriginal History of Canada (C)	6
HIST 2282	Inventing Canada (C)	3
HIST 2284*	Democracy and Dissent in Canada: Social Movements in the 20th Century (C)	3
HIST 2286	Modern Canada (C)	3
HIST 2288	History of Social Movements in Canada (C)	3
HIST 2950*	Early Canada: from the Earliest Settlement to 1867 (C)	6
HIST 2951*	Les origines du Canada: depuis la première colonie jusqu'en 1867 (USB)	6
HIST 2960*	The New Dominion: 1867 to 1921 (C)	6
HIST 2961*	Le nouveau Dominion: de 1867 à 1921 (USB)	6
HIST 2970*	Modern Canada: 1921 to the Present (C)	6
HIST 2971	Le Canada moderne: de 1921 à nos jours (USB)	6
HIST 3050	Canada since 1945 (C)	6
HIST 3052	Canada since the 1960s (C)	3
HIST 3054	Canada and the United States (C)	3
HIST 3220*	The History of Canadian-American Relations (A,C)	6
HIST 3250	Canada and the World, 1867 to the	6

HIST 3442	Present (C)		NATV 2320	Structure of the Cree Language	3
	Race, Ethnicity, Immigration, and	3	NATV 2410	Canadian Native Literature	3
HIST 3572	Nation in Canadian History (C)		NATV 2420	Inuit Literature in Translation	3
	The History of Women, Gender, and	6	NATV 2450	Images of Indians in North American	3
	Sexuality in Canada (C)			Society	
HIST 3690	History of Northern Canada (C)	6	NATV 3000	Selected Topics	3
HIST 3721	Histoire du Manitoba (C) (USB)	6	NATV 3240	Native Medicine and Health	3
HIST 3730	A History of Western Canada (C)	6	NATV 3270	The Métis Nation	3
HIST 3780	Studies in Canadian History 1 (C)	3	NATV 3280	Aboriginal Peoples and the Canadian	3
HIST 3781	Études choisies en histoire du	3		Justice System	
	Canada 1 (USB)		NATV 3300	Native Language Planning and	3
HIST 3790*	Studies in Canadian History 2 (C)	3		Development	
HIST 3791	Études choisies en histoire du	3	NATV 3310	Canadian Law and Aboriginal Peoples	3
	Canada 2 (USB)		NATV 3320*	Aboriginal Organizations	3
HIST 3910	The Ukrainians in Canada (C)	3	NATV 3340*	Circumpolar Cultures and Lifestyles	3
HIST 4060	Gender History in Canada (C) (H)	6	NATV 3370	Political Development in the North	3
HIST 4280	Topics in the Cultural History of	6	NATV 3380	Cultural Constructions of Gender in	3
	Canada (C) (H)			Canadian Aboriginal Societies	
HIST 4340	Introduction to Archival Science (G)	6	NATV 4200	First Nations Government	3
	(H)		NATV 4210	Seminar in Contemporary and	3
HIST 4390*	The History of White Attitudes and	6		Historical Métis Issues	
	Policies towards Native Peoples in		NATV 4220	Environment, Economy and	3
	North America (C) (H)			Aboriginal People	
HIST 4680	Social History of Health and Disease	6	NATV 4230	Traditional Knowledge and Native	3
	in Modern Canada (C) (H)			Studies Research	
HIST 4700*	Canada, 1896 to the Present (C) (H)	6	NATV 4240	Arctic Lifestyles	3
HIST 4720*	History of Manitoba (C) (H)	6	NATV 4250	Topics on Aboriginal Identities	3
HIST 4890	Canadian Social History (C) (H)	6	NATV 4260*	Sacred Lands and Sacred Spaces of	3
HIST 4900*	The Hudson's Bay Company and	6		Indigenous Peoples	
	British North America (C) (H)		NATV 4280	Missionaries, Colonialism and	3
HIST 4950*	History of Quebec (C) (H)	6		Aboriginal Peoples	
011.133*	History of Canada from 1534 (C)	6	032.090*	Introductory Cree	6
011.133F*	Histoire du Canada (USB)	6	032.091*	Introductory Ojibway	6
011.254*	North American Indian (A,C,S)	6	032.121*	Intermediate Ojibway	6
011.324*	Protestantism and the Development	6	032.130*	Intermediate Cree	6
	of the Canadian Community, 1749-		032.205*	Coastal Indians of Canada	3
	1970 (C,S)		032.220*	Native Societies and the Political	3
011.438*	Intellectual History of Canada (C)	3		Process	
	(H)		032.321*	The Native Identity	6
011.449*	The New Canada, 1867-96 (S) (H)	6	032.323*	Native Peoples and the Law 2	3
Icelandic			032.325*	Native Peoples and the Law 1	3
ICEL 2230	Contemporary Icelandic-Canadian	3	032.373*	Art of the North American Native	3
	Literature			Peoples	
ICEL 2300*	Icelandic-Canadian Literature (H)	6	Political Studies		
ICEL 3460*	Laura Goodman Salverson	3	POLS 1070	Law, Politics and Power in Canada	3
ICEL 4440	The Icelanders in Canada (H)	3	POLS 2070	Introduction to Canadian	6
012.445*	Stephan G. Stephansson (H)	3		Government	
Labour Studies			POLS 2071	Introduction au système	6
LABR 3510	Industrial Relations (Cross-listed	6		gouvernemental Canadien (USB)	
	with Economics ECON 3510)		POLS 2561	Questions d'actualité en politique	6
Linguistics				Canadienne (USB)	
LING 1360	Languages of Canada	3	POLS 2570*	Introduction to Public Administration	6
			POLS 2571	Initiation à l'administration publique	6
Native Studies				(USB)	
NATV 1200	The Native Peoples of Canada	6	POLS 3100	Gender and Politics in Canada	3
NATV 1220	The Native Peoples of Canada, Part 1	3	POLS 3170	The Canadian Charter of Rights and	3
NATV 1240	The Native Peoples of Canada, Part 2	3		Freedoms	
NATV 1250	Introductory Cree 1	3	POLS 3470	Canadian Public Management	3
NATV 1260	Introductory Cree 2	3	POLS 3520	Canadian Foreign and Defence Policy	6
NATV 1270	Introductory Ojibway 1	3	POLS 3561	Politique étrangère Canadienne	6
NATV 1280	Introductory Ojibway 2	3		(USB)	
NATV 1290	Introductory Inuktitut	3	POLS 3670	Canadian Political Parties	3
NATV 2020	The Métis of Canada	3	POLS 3860	Canadian Federalism	3
NATV 2040	Native Peoples of the Northern Plains	3	POLS 3960	Canadian Politics	6
NATV 2060	The Native Peoples of the Eastern	3	POLS 4070	Advanced Seminar: Canadian	3
	Woodlands			Government (H)	
NATV 2070	The Native Peoples of the Subarctic	3	POLS 4080	Advanced Seminar: Canadian	3
NATV 2080	Inuit Society and Culture	3		Democracy (H)	
NATV 2220	Native Societies and the Political	3	POLS 4140	Canadian Political Ideas (H)	3
	Process		POLS 4150	Indigenous Governance (H)	3
NATV 2250	Intermediate Cree	6	POLS 4180	Provincial Politics in Canada (H)	3
NATV 2270*	Intermediate Ojibway	6	POLS 4190	Manitoba Politics and Government	3
NATV 2272	Intermediate Ojibway 1	3		(H)	
NATV 2274	Intermediate Ojibway 2	3	POLS 4660	The State in the Economy (H)	6
NATV 2300	Cree Literature	3	POLS 4860	The Canadian Policy Process (H)	6
			019.156*	Introduction to Canadian	6

	Government	
019.156F*	Introduction au système gouvernemental Canadienne (USB)	6
019.206*	Urban and Local Politics	6
019.256*	Issues of Canadian Politics	6
019.266*	Human Rights and Civil Liberties	6
019.286*	Canadian Political Parties	6
019.356*	Canadian Foreign Policy	6
019.366*	Quebec and the Canadian Political System (H)	3
019.368*	Canadian Defense Policy	3
019.476*	Manitoba Politics and Voting Behaviour	6
019.487*	Government and Public Sector Unionism (H)	6
	Religion	
RLGN 2410*	Religion in Canada (C)	6
RLGN 2411*	Les religions au Canada (USB)	6
RLGN 2590	Religion and Social Issues	3
RLGN 2591	La religion et les problèmes sociaux (USB)	3
020.272*	Dimensions of Religiosity in Contemporary Canadian Literature	6
	Slavic Studies	
UKRN 2410	Ukrainian Canadian Cultural Experience	3
UKRN 2420*	Ukrainian Canadian Literature	3
UKRN 2430*	Ukrainian Canadian Folklore	3
	Sociology	
SOC 2320	Canadian Society and Culture	3
SOC 2321	La société Canadienne et sa culture (USB)	3
SOC 2370	Ethnic Relations	3
SOC 2371	Rapports ethniques (USB)	3
SOC 2531	Sociologie du Manitoba (USB)	6
SOC 2610	Sociology of Criminal Justice and Corrections	3
SOC 2620	The Sociology of Aging	3
SOC 3380	Power, Politics and the Welfare State	3
SOC 3470*	Political Sociology	3
SOC 3471	Sociologie politique (USB)	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 2900	Geography of Canadian Prairie Landscapes (A)	3
GEOG 3431	Géographie du Canada (USB)	3
GEOG 3480*	Canadian Problems	3
GEOG 3481	Particularités de la géographie du Canada (USB)	3
GEOG 3700*	Canada: The Making of the Human Landscape (A)	6
GEOG 3701	Canada: évolution de l'écoumène (USB)	6
GEOG 3900*	Geography of Manitoba (A)	3
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

Classics

Introduction:

CLAS 2500 Aspects of Classical Culture and Languages Cr.Hrs. 3 +3.0

The content of this course will vary, being devoted each time to surveying a special area of Classical civilization such as athletics, technology, warfare, death, slavery, education, or reception in modern film or literature. Ancient textual and archaeological evidence will form the basis of discussion. As the topics for this course will vary from year to year, students may take this course more than once for credit.

NET CHANGE IN CREDIT HOURS: +3.0

Economics

Modifications:

ECON 2030 Mathematical Economics 1 Cr.Hrs. 3 0.0

Introduction to mathematical methods used in economic analysis including differentiation, matrix algebra, comparative statics, and optimization. Students may not hold credit for both ECON 2030 and the former ECON 2530 (018.253). Prerequisite: [a grade of "C" or better in six credit hours of 1000 level Economics] and [a grade of "C" or better in MATH 1230 or MATH 1500 (136.150) or MATH 1501 or MATH 1520 (136.152)].

ECON 2040 Quantitative Methods in Economics Cr.Hrs. 3 0.0

An introduction to statistical methods relevant to Economics, which include: descriptive statistics; probability and probability distributions; hypothesis testing; and ordinary least squares regression. The use of contemporary econometric software is required. Students may not hold credit for both ECON 2040 and the former ECON 3170 (018.317). Prerequisite: a grade of "C" or better in six credit hours of 1000 level Economics.

ECON 3010 Microeconomic Theory 2 Cr.Hrs. 3 0.0

This course uses basic calculus and optimization techniques to study consumer and firm behaviour, demand and supply theory, monopoly, monopolistic competition, oligopoly, and the Edgeworth Box analysis of an exchange economy. Students may not hold credit for ECON 3010 and any of: ECON 2461, the former ECON 2460 (018.246), or the former ECON 3700 (018.370). Prerequisite: [a grade of "C+" or better in ECON 2010 or ECON 2451 (018.245) or the former ECON 2450 (018.245) or the former ECON 2700 (018.270)] and [a grade of "C" or better in MATH 1230 or MATH 1500 (136.150) or MATH 1501 or MATH 1520 (136.152)].

ECON 3020 Macroeconomic Theory 2 Cr.Hrs. 3 0.0

Theories of national income, employment, inflation, balance of payments, stabilization policy, and economic growth within the framework of macroeconomic models of an open economy with particular attention to empirical evidence from Canada, the U.S., and other countries. This course requires the use of calculus. Students may not hold credit for ECON 3020 and any of: ECON 2481, the former ECON 2480 (018.248), or the former ECON 3800 (018.380). Prerequisite: [a grade of "C+" or better in ECON 2020 or ECON 2471 or the former ECON 2470 (018.247) or the former ECON 2800 (018.280)] and [a grade of "C" or better in MATH 1230 or MATH 1500 (136.150) or MATH 1501 or MATH 1520 (136.152)].

NET CHANGE IN CREDIT HOURS: 0.0

Program modifications:

Modifications to the following are outlined on the next pages:

- **Bachelor of Arts (Joint Honours) in Economics - Mathematics**
- **Bachelor Arts (Joint Honours) in Economics - Statistics**
- Program Notes

Economics-Mathematics

Modification of the Economics-Mathematics Joint Honours and Program Notes

Added material

Deleted material

8.9.4 Economics-Mathematics Joint Honours Program

YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS⁴ TOTAL: 120 CREDIT HOURS			
<ul style="list-style-type: none"> Both ECON 1010 and ECON 1020, or both ECON 1210 and ECON 1220, or the former ECON 1200; MATH 1300¹; MATH 1500^{1,2}; MATH 1700^{1,2}; STAT 1000³; COMP 1010³ Plus 9 credit hours of electives⁶ which should include the required "Written English" course Both ECON 1010 and ECON 1020, or both ECON 1210 and ECON 1220 MATH 1220¹, MATH 1230¹, MATH 1232¹, MATH 1240¹ STAT 1000² COMP 1010² 6 credit hours of electives, including 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 ECON 2010, ECON 2020 MATH 2020, MATH 2080, MATH 2090, MATH 2150, MATH 2180 9 credit hours of approved electives 	<ul style="list-style-type: none"> ECON 3700; ECON 3800; ECON 3180³ (or STAT 2000)³; MATH 2600³; MATH 3230; MATH 3300⁵; 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 ECON 3010, ECON 3020, ECON 3040² MATH 2030, MATH 2160, MATH 3320, MATH 3340, MATH 3440, MATH 3470, MATH 3472 24 credit hours of approved Economics courses³ 3 credit hours from MATH 2140, MATH 3420, MATH 3460, MATH 4370, or any Mathematics course at the 4000 level 3 credit hours of Mathematics courses at the 3000 or 4000 level 	
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 The combination of MATH 1500 (or MATH 1510 or MATH 1520) 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. ⁷ Economics Honours courses: ECON 2700, ECON 2800, ECON 3700, ECON 3800, ECON 3810 and all 4000 level courses. ¹ Students in this program must achieve a minimum grade of "B" in MATH 1230, MATH 1232, MATH 1220, and MATH 1240.			

Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (A) in place of MATH 1220, MATH 1500 (A) in place of MATH 1230, MATH 1700 (A) in place of MATH 1232, MATH 1690 (B) in place of MATH 1230 and MATH 1232.

² Some courses may be taken in a different year than indicated; STAT 1000, COMP 1010, ECON 3040 may be taken in Year 2. The normal prerequisite for ECON 3040 is ECON 2040, which will be waived for students in this program who have completed Year 1.

³ 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 and at least 6 credit hours must be at the 4000 level. Students are encouraged to take ECON 4010, ECON 4020 and ECON 4040.

⁴ Economics Honours courses: ECON 3030, ECON 3810 and all 4000 level courses.

Economics-Statistics

Modification of the Economics-Statistics Joint Honours and Program Notes

Added material

Deleted material

8.9.4 Economics-Statistics Joint Honours Program

YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS^{5,3} TOTAL: 120 CREDIT HOURS			
<ul style="list-style-type: none"> Both ECON 1010 and ECON 1020, or both ECON 1210 and ECON 1220, or the former ECON-1200 MATH 1300^{1,2}, MATH 1500^{1,2}, MATH 1700^{1,2}, MATH 1220¹, MATH 1230¹, MATH 1232¹, MATH 1240 STAT 1000³ COMP 1010³ Plus 9-6 credit hours of electives which should include the required "Written English" course 	<ul style="list-style-type: none"> ECON 2700, ECON 2800, ECON 2010, ECON 2020 STAT 2000, STAT 2400 MATH 2202, MATH 2352, MATH 2750, MATH 2030, MATH 2080, MATH 2140, MATH 2150 Plus 3-6 credit hours of approved Economics electives^{4,2} 	<ul style="list-style-type: none"> ECON 3700, ECON 3800, ECON 3010, ECON 3020 STAT 3400, STAT 3470, STAT 3480, STAT 3490, STAT 3800 One of: MATH 3740 or MATH 3760, MATH 2160, MATH 3360 Plus 3 credit hours of approved Economics electives^{4,2} 	<ul style="list-style-type: none"> ECON 4120, ECON 4130, ECON 4040, ECON 4042 STAT 4100, STAT 4200, STAT 4520, STAT 4530, STAT 4580 Plus 12 credit hours of approved Economics electives^{4,2}
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 The combination of MATH 1500 ¹ and MATH 1700 ¹ 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 18-21 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, ECON 2030 and ECON 3040 are recommended in Year 2 or 3. The normal prerequisite for ECON 3180 is ECON 3170, ECON 3040 is ECON 2040, which will be waived for students in this program who have completed Year 1. ^{5,3} Economics Honours courses: ECON 2700, ECON 2800, ECON 3700, ECON 3800, ECON 3030, ECON 3810 and all 4000 level courses.			

French, Spanish, and Italian

Introductions:

FREN 2022 La grammaire au bureau (A) Cr.Hrs. 3 +3.0

Ce cours vise à acquérir, analyser et pratiquer le vocabulaire du français des affaires et de l'administration. Un accent sera mis sur l'acquisition de structures grammaticales propres à la rédaction de textes du domaine des affaires. Students may not hold credit for both FREN 2022 and FREN 2630 (044.263) with the topic "Français commercial." Prerequisite: [a grade of "C" or better in FREN 1190 (044.119) or FREN 1200 (044.120)] or written consent of department head.

FREN 3022 Les communications au bureau (A) Cr.Hrs. 3 +3.0

Ce cours vise à acquérir, analyser et pratiquer le vocabulaire du français des affaires et de l'administration. Un accent sera mis sur la maîtrise des outils linguistiques et des techniques spécifiques propres à la rédaction de textes de type commercial et administratif. Students may not hold credit for both FREN 3022 and FREN 2630 (044.263) with the topic "Français commercial." Prerequisite: [a grade of "C" or better in any 2000-level French course] or written consent of department head. FREN 2610 (044.261) may not be used as a prerequisite.

Modification:

FREN 3910 Expression écrite 2 (A) Cr.Hrs. 3 0.0

(Formerly 044.391) Ce cours est une étude des techniques de composition libre à un niveau avancé. Il comportera notamment des exercices avec la phrase complexe et l'étude et la pratique d'un certain nombre de genres de français écrit. Prerequisite: [a grade of "C" or better in any 2000-level French course] or written consent of department head.

NET CHANGE IN CREDIT HOURS: +6.0

German and Slavic Studies

Modifications:

GRMN 1120 Beginning German (A) Cr.Hrs. 6 0.0

(Formerly 008.112) (Lab required) Three hours of lectures, plus one hour of language lab or conversation class per week. The course is intended for students with little or no previous knowledge of German. Basic grammar is included, but emphasis is placed on the development of broad reading and speaking skills. Satisfactory completion of this course enables students to proceed to GRMN 2100 or GRMN 2103. Students may not hold credit for GRMN 1120 and any of: GRMN 1123 or GRMN 1125 or the former GRMN 1121 (008.112). Students with Grade 12 German or its equivalent may not normally take the course for credit. Not open to students who have previously obtained credit for GRMN 2100 or GRMN 2103 or GRMN 2105 or the former GRMN 2101 (008.210).

GRMN 2100 Intermediate German (A) Cr.Hrs. 6 0.0

(Formerly 008.210) Grammar review, exercises, development of practical oral skills, conversation and modern usage. Introduction to German poetry and prose. Students may not hold credit for GRMN 2100 and any of: GRMN 2103 or GRMN 2105 or the former GRMN 2101 (008.210). Prerequisite: [German 40S] or [a grade of "C" or better in GRMN 1120 or GRMN 1125 or the former GRMN 1121 (008.112)] or written consent of department head.

GRMN 2140 Exploring German Literature (B) Cr.Hrs. 3 0.0

Language of instruction: German. In this intermediate course, we will read and discuss a number of works belonging to different literary genres by major German-speaking authors, such as Kafka, Mann, Brecht, Böll, Grass, Jelinek, Wolf, and others. Activities and assignments in this course will focus on the development of reading competency in different literary genres, the expansion of students' German vocabulary, and the development of German written and oral expression. Prerequisite: [a grade of "C" or better in GRMN 2100 or GRMN 2105 or GRMN 3200 (008.320) or GRMN 3201 or the former GRMN 2101 (008.210)] or written consent of department head.

GRMN 2480 Special Topics in German (B) Cr.Hrs. 3 0.0

(Formerly 008.248) Language of instruction: German. Topics dealing with German literature and culture. Course content will vary from year to year depending on the interests and needs of students and staff. Prerequisite: [a grade of "C" or better in GRMN 2100 or GRMN 2105 or GRMN 3200 (008.320) or GRMN 3201 or the former GRMN 2101 (008.210)] or written consent of department head. As the course content will vary from year to year, students may take this course more than once for credit.

GRMN 3200 Deutsche Sprachpraxis 1 (A) Cr.Hrs. 6 0.0

(Formerly 008.320) Modern German usage through conversation, writing and practical exercises; study of contemporary fictional and non-fictional texts and films. Emphasis on vocabulary and structural and stylistic problems. Students may not hold credit for both GRMN 3200 and GRMN 3201 (008.320). Prerequisite: a grade of "C" or better in GRMN 2100 or GRMN 2105 or the former GRMN 2101 (008.210).

GRMN 3230 Business German (A) Cr.Hrs. 3 0.0

An introduction to the contemporary terminology and usage of German in the workplace. Listening, speaking, reading, and writing skills will be developed through a variety of activities. This course also aims at developing cross-cultural awareness. The course prepares the student for the business exam Zertifikat für den Beruf. Students may not hold credit for both GRMN 3230 and GRMN 3211 (008.321). Prerequisite: [a grade of "C" or better in GRMN 2100 or GRMN 2105 or GRMN 3200 (008.320) or GRMN 3201 or the former GRMN 2101 (008.210)] or written consent of department head.

NET CHANGE IN CREDIT HOURS: 0.0

Global Political Economy

Modifications:

GPE 1700 Social Justice in the 21st Century: Global Political Economy and Environmental Change Cr.Hrs. 3 0.0

Introduces students to political economy and cultural geography through the close analysis of contemporary world events, including but not limited to instances of violent conflict, environmental change, international negotiations, political processes and events, social movements, and policy developments. A multimedia approach will advance students' understanding of geopolitical events from political economy and spatial perspectives. Specific content of the course will change year-by-year in response to developments in national and

world politics. Also offered by Clayton H. Riddell Faculty of Environment, Earth, and Resources as GEOG 1700. Students may not hold credit for both GPE 1700 and GEOG 1700.

GPE 3700 A Survey of Global Political Economy Cr.Hrs. 3 0.0
Provides students with a systemic intellectual history of the field of Global Political Economy. The course delineates Global Political Economy as a distinctive scholarly tradition, discusses the separation of economics and politics, and surveys the tradition from classical political economy through historical materialism, development economics, imperialism, world systems theory, and more. Students will relate these approaches to contemporary issues in GPE such as economic and ecological crises, inequality, or corporate power. Prerequisite: [a grade of "C" or better in GPE 1700 or GEOG 1700] or written consent of instructor.

NET CHANGE IN CREDIT HOURS: 0.0

Program modifications:

Modifications to the following are outlined on the next page:

- **Bachelor Arts (General Major) in Global Political Economy**
- **Bachelor Arts (Single Advanced Major) in Global Political Economy**
- List of Courses for Global Political Economy, including List A – Faculty of Arts

Global Political Economy

- Modification of General Major, Single Advanced Major and List A

Added material

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8.13.1 Program Information

The departments of Anthropology, Economics, History, Political Studies and Sociology collaborate in a Major and Advanced Major that explores change in social, economic, political and international relations that have re-shaped and continue to re-shape the world. The public and private sectors, as well as non-governmental agencies, must understand the global forces that affect their international relationships as well as those that affect their internal ability to respond to restructuring forces around them.

For entry to the General Major, the prerequisite is a grade of "C" or better in the following: both ECON 1010 and ECON 1020, or both ECON 1210 and ECON 1220; and 6 credit hours from GPE 1700 (or GEOG 1700), HIST 1370, HIST 1380, HIST 1500, HIST 2380, HIST 2720.

For entry to the Single Advanced Major, the prerequisite is a grade of "C" or better in the following: both ECON 1010 and ECON 1020, or both ECON 1210 and ECON 1220; and 6 credit hours from GPE 1700 (or GEOG 1700), HIST 1370, HIST 1380, HIST 1500, HIST 2380, HIST 2720, POLS 1000.

For entry, continuation and graduation requirements for the General Degree, Advanced Degree and Honours Degree, see [Section 3: Basic Faculty Regulations for the B.A. General, Advanced and Honours Degree Programs](#).

Note: Students who declare and complete a Major will not be required or allowed to complete a separate field for a Minor for purposes of satisfying degree requirements.

8.13.2 Global Political Economy

YEAR 1	YEAR 2	YEAR 3	YEAR 4
GENERAL MAJOR¹ TOTAL: 48 CREDIT HOURS			
<ul style="list-style-type: none"> 6 credit hours from the following: HIST 1370, HIST 1380, HIST 1500, HIST 2380, HIST 2720 ECON 1010 and ECON 1020, or ECON 1210 and ECON 1220 GPE 1700 (<u>or GEOG 1700</u>) 	<ul style="list-style-type: none"> ANTH 2000² ECON 2540 ECON 2550 GPE 2700 SOC 2290³, or both ANTH 3930 and STAT 1000 	<ul style="list-style-type: none"> ANTH 3320² GPE 3700 POLS 3250⁴ or ANTH 3750 POLS 3270⁴ SOC 3380 or SOC 3838 or SOC 3840 or SOC 3890³ 	
SINGLE ADVANCED MAJOR TOTAL: 66 CREDIT HOURS			
<ul style="list-style-type: none"> 6 credit hours from the following: HIST 1370, HIST 1380, HIST 1500, HIST 2380, HIST 2720 ECON 1010 and ECON 1020, 	<ul style="list-style-type: none"> ANTH 2000² ECON 2540 	<ul style="list-style-type: none"> ANTH 3320² GPE 3700 	GPE 4700

or ECON 1210 and ECON 1220	• ECON 2550	• POLS 3250 ⁴ or ANTH 3750	
• GPE 1700 (or <u>GEOG 1700</u>)	• GPE 2700	• POLS 3270 ⁴	
• POLS 1000	• SOC 2290 ³ , or ANTH 3930 and STAT 1000	• SOC 3380 or SOC 3838 or SOC 3840 or SOC 3890 ³	
In years 2, 3 and 4 students must take an additional 9 credit hours from List A.			

NOTES:

¹ Students in the General Major are very strongly advised to include in their elective courses a minimum of 6 credit hours from the following list (if not already taken in the core requirements): ANTH 2530, ANTH 3750, ECON 2630, HIST 1370, HIST 1380, HIST 1500, HIST 2380, HIST 2670, HIST 2680, HIST 2720, POLS 1000, POLS 2040, POLS 3250, POLS 3810, SOC 3380, SOC 3838, SOC 3840, SOC 3890.

² Students are advised to take ANTH 1220 or ANTH 1520 as an elective in Year 1 as it is the prerequisite for some upper level Anthropology courses. Otherwise, students will require written consent of Anthropology department head prior to registration.

³ Students are advised to take SOC 1200 as an elective in Year 1 as it is the prerequisite for upper level Sociology courses. Otherwise, students will require written consent of Sociology department head prior to registration.

⁴ Students are advised to take POLS 2040 as an elective in Year 2 as it is the prerequisite for upper level Political Studies courses. Otherwise, students will require written consent of Political Studies department head prior to registration.

List of Courses for Global Political Economy

See the departmental Calendar section for full course descriptions.

Global Political Economy		
GPE 1700	Social Justice in the 21 st Century: Global Political Economy and Environmental Change (<u>same as GEOG 1700</u>)	3
GPE 2700	Perspectives on Global Political Economy	3
GPE 3700	A Survey of Global Political Economy	3
GPE 4700	Studies in Global Political Economy	6
Anthropology		
ANTH 2000	Culture, Society, and Power	3
ANTH 2530	Anthropology of Political Systems	3
ANTH 3320	Women in Cross-Cultural Perspective	3
ANTH 3750	Globalization and the World-System	3
Economics		
ECON 1010	Introduction to Microeconomic Principles	3
ECON 1020	Introduction to Macroeconomic Principles	3
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
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 (G,M)	6
HIST 2720	The World Since 1945 (G,M)	6

Political Studies

POLS 1000	Democracy and Development	3
POLS 3250	International Political Economy	3
POLS 3270	Theories of the Capitalist World Order	3

Sociology

SOC 2290	Introduction to Research Methods	6
SOC 3380	Power, Politics and the Welfare State	3
SOC 3838	Ecology and Society	3
SOC 3840	Community and Social Reconstruction	3
SOC 3890	Power and Inequality in Comparative Perspective	3

**List A
Faculty of Arts**

Anthropology		
ANTH 2530	Anthropology of Political Systems	3
ANTH 3750	Anthropological Perspectives on Globalization and the World-System	3
Economics		
ECON 2630	An Introduction to the World's Economies	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 (G,M)	6
HIST 2670	History of Capitalism (M)	3
HIST 2680	A History of Socialism from the French Revolution to the Present (M)	3
HIST 2720	The World Since 1945 (G,M)	6

HIST 3580	Topics in Recent World History 1 (M) Acceptable for credit only when the topic is "Global Economic Crises in World History, 1929-Present"	3	Sociology SOC 2240 SOC 3380	<u>Sociology of Globalization</u> Power, Politics and the Welfare State	3 3
Political Studies			SOC 3838 SOC 3840	Ecology and Society Community and Social Reconstruction	3 3
POLS 2040	Introduction to International Relations	6	SOC 3890	Power and Inequality in Comparative Perspective	3
POLS 3250	International Political Economy	3			
POLS 3810	Introduction to Marxism	3			

Judaic Studies

Program modification:

A modification to List A – Courses Acceptable for Judaic Studies Credit, is outlined on the next page:

Judaic Studies

- Modification of List A

Added material

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List A Courses Acceptable for Judaic Studies Credit

With written consent of the program coordinator courses not on this list may be taken for credit if they include sufficient Judaic Studies content.

Course No.		Credit Hours
Faculty of Arts		
Classics		
CLAS 3260	Hellenistic Civilization: History and Archaeology	3
GRK 2810	Prose Writings of the Hellenistic and Greco-Roman Periods	3
German and Slavic Studies		
GRMN 3260	Representations of the Holocaust (B)	3
GRMN 3262	Representations of the Holocaust in English Translation (C)	3
UKRN 2820	Holodomor and Holocaust in Ukrainian Literature and Culture	3
History		
HIST 2240	History of Antisemitism and the Holocaust (E)	6
HIST 2250	Social History of the Jews: Antiquity to Present (G)	6
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 4500	Jewish and European History and Historiography (E)	6
Political Studies		
POLS 3340	Middle East Politics	3
Religion		
RLGN 1120	Biblical Hebrew	6
RLGN 1390	Readings in Biblical Hebrew 1	3
RLGN 1400	Readings in Biblical Hebrew 2	3
RLGN 2140	Introduction to Judaism	3
RLGN 2150*	The Talmud (A)	3
RLGN 2160	Introduction to Hebrew Scriptures	3
RLGN 2231*	Étude de l'Ancien Testament (A)	6
RLGN 2760	Rabbinic Judaism	3
RLGN 2770	Contemporary Judaism	3
RLGN 3280	Hasidism	3
RLGN 3790*	Prophets of Ancient Israel (A)	6
RLGN 3800	Selected Old Testament Literature and Themes	6
<u>RLGN 3810</u>	<u>The Talmud</u>	<u>3</u>
RLGN 3824	Kabbalah	3
RLGN 3830	The Bible as Story	3
RLGN 4300	Advanced Topics in Judaism	3

* Indicates course no longer offered.

Psychology

Deletions:

PSYC 3660 Sport Psychology Cr.Hrs. 3 -3.0

Introduction:

PSYC 2660 Sport Psychology Cr.Hrs. 3 +3.0

This course examines the use of psychological knowledge to enhance the development of performance and satisfaction of athletes and others associated with sports. Topics include improving skills of athletes, motivating practice performance, increasing the effectiveness of coaches, and mental preparation for competition. Students may not hold credit for both PSYC 2660 and the former PSYC 3660 (017.366). Prerequisite: [a grade of "C" or better in PSYC 1200 or the former PSYC 1201 (017.120)] or [a grade of "C" or better in both PSYC 1211 (017.121) and PSYC 1221 (017.122)] or written consent of department head.

NET CHANGE IN CREDIT HOURS: 0.0

Sociology

Modification:

SOC 3370 Sociology of Work Cr.Hrs. 3 0.0

(Formerly 077.337) An examination of work as a central aspect of human social life; its changing nature and content in response to technological, political, and social change; how work is organized and understood by employers and workers; its consequences for individuals, social institutions, and society. Students may not hold credit for both SOC 3370 (077.337) and SOC 3371. Prerequisite: [a grade of "C" or better in SOC 1200 (077.120) or the former SOC 1201] or [a grade of "C" or better in both SOC 1211 (077.121) and SOC 1221 (077.122)].

NET CHANGE IN CREDIT HOURS: 0.0

Faculty of Arts

Interfaculty Option in Aging

Program modification:

Modifications to the **Interfaculty Option in Aging Concentration** are outlined on the next page.

Faculty of Arts - Interfaculty Option in Aging

- Modification of Concentration

Added material

~~Deleted material~~

The Interfaculty Option in Aging Concentration is available to students in all B.A. degree programs.

This Concentration is offered by: Arts, Human Ecology, Nursing, Kinesiology and Recreation Management, and Social Work. To complete the Concentration, Arts students will need to complete each of the following: a) The Social Aspects of Aging, HMEC 2650 or REC 2650 or SWRK 2650; and b) Health and Physical Aspects of Aging, NURS 2610 or KIN 2610; and c) an additional twelve credit hours from the following courses:

Faculty of Arts

English, Film, and Theatre

FILM 3420	Film Theory	3
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Psychology

PSYC 2360	Brain and Behaviour	3
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PSYC 2370*	Developmental Psychology from Adolescence to Old Age	3
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PSYC 2490	<u>Abnormal Psychology</u>	3
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PSYC 3070	Adult Development	3
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PSYC 3350	Behaviour Neuroscience	3
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PSYC 3460*	Abnormal Psychology	3
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PSYC 3490	Individual Differences	3
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PSYC 3610	Memory	3
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PSYC 4420	Neuroimaging: Imaging and Thoughts	3
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PSYC 4430	Vision: Perception and Action	3
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PSYC 4566	Psychology of Health and Aging	3
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Religion

RLGN 1410	Death and Concepts of the Future (C)	3
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Sociology

<u>SOC 2310</u>	<u>Selected Social Problems</u>	<u>3</u>
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Acceptable for credit only when topic is "Canadian Social Issues"

SOC 2490	Sociology of Health and Illness	3
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SOC 2620	Sociology of Aging	3
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SOC 3510*	Population Dynamics and Change	3
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SOC 3540	The Sociology of Health Care Systems	3
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Clayton H. Riddell Faculty of Environment, Earth, and Resources

Geography

GEOG 4710*	Geography of the Elderly and Aging	3
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* Indicates course no longer offered.

Upon completion of these requirements, the Option in Aging will be recorded as a concentration on the student's official transcript. For information concerning the option, interested students are directed to faculty general offices.

Faculty of Arts

Mathematics

Program modifications:

Modifications to the following programs are outlined on the next pages

- **Bachelor of Arts (General Major) in Mathematics**
- **Bachelor of Arts (Single Advanced Major) in Mathematics**
- **Minor in Mathematics**
- Program Notes

Faculty of Arts - Mathematics

Modification of General Major, Single Advanced Major, Minor and Program Notes

Added material

Deleted material

9.3.1 Mathematics

YEAR 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 one of MATH 1700, MATH 1710; or MATH 1690 MATH 1200 one of MATH 1300, MATH 1310 	MATH 2300, MATH 2720 ² , MATH 2730 ²	9 credit hours from MATH 2400, MATH 2450, MATH 2500, MATH 2552, MATH 2600 ¹ , MATH 2800, or any 3000 or 4000 level Mathematics course	
<u>MATH 1220¹, MATH 1230¹, MATH 1232¹, MATH 1240¹</u>	<u>18 credit hours of 2000, 3000 and/or 4000 level Mathematics courses (of these a minimum of 3 credit hours must be at the 3000 or 4000 level)</u>		
SINGLE ADVANCED MAJOR TOTAL: 48 CREDIT HOURS			
<ul style="list-style-type: none"> one of MATH 1500, MATH 1510, MATH 1520 one of MATH 1700, MATH 1710; or MATH 1690 one of MATH 1300, MATH 1310 	MATH 2300, MATH 2600 ¹ or MATH 2800, MATH 2720 ² and MATH 2730 ²	<ul style="list-style-type: none"> MATH 3300, MATH 3740 18 credit hours from the following list of which at least 3 credit hours must be at the 3000 or 4000 level: MATH 2202, MATH 2400, MATH 2450, MATH 2500, MATH 2552, MATH 2600¹, MATH 2800, or any 3000 or 4000 level Mathematics course 	
<u>MATH 1220¹, MATH 1230¹, MATH 1232¹, MATH 1240¹</u>	<u>MATH 2080, MATH 2090, MATH 2150</u>	<ul style="list-style-type: none"> MATH 2020, MATH 2180, MATH 3470 MATH 2160 or MATH 3440 15 credit hours from the following list of which at least 3 credit hours must be at the 3000 or 4000 level: MATH 2030, MATH 2040, MATH 2070, MATH 2140, MATH 2160, MATH 2170, or any 3000 or 4000 level Mathematics course 	
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 one of MATH 1690, MATH 1700, MATH 1710 plus a minimum of 9 credit hours from MATH 1200 and 2000 and (or) 3000 level Mathematics courses 			
<ul style="list-style-type: none"> MATH 1220¹, MATH 1230¹, MATH 1232¹ 9 credit hours from: MATH 1240¹ and 2000 and/or 3000 level Mathematics courses 			

NOTES:

¹MATH 2600 has a prerequisite of COMP 1010.

²MATH 2750 may be substituted for MATH 2720 and MATH 2730.

¹ MATH 1500 or MATH 1510 may be taken in place of MATH 1230; MATH 1300 or MATH 1310 may be taken in place of MATH 1220; MATH 1700 or MATH 1710 may be taken in place of MATH 1232; MATH 1200 may be taken in place of MATH 1240, but these courses are not equivalent, i.e., students should note that MATH 1240 is a prerequisite to some 2nd year Mathematics courses for which MATH 1200 is not a prerequisite.

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.

School of Dental Hygiene

Modification:

HYGN 2370 Nutrition in Dentistry Cr.Hrs. 2 0.0
An examination of the fundamentals of nutrition and the relationship between nutrition and health within the context of the health professions. The focus is on nutritional strategies used to promote health and in the treatment of common health conditions. The primarily on-line content is followed up with a combination of oral health specific patient/clinical exercises for Dental Hygiene students. May not be held with HNSC 2170.

College of Dentistry

College of Dentistry (General Dentistry)

Deletions:

DENT 1010 Early Clinical Experience Cr.Hrs. 6 -6.0
DENT 2430 Introduction to Comprehensive Care Cr.Hrs. 6 -6.0
DENT 4020 Interdisciplinary Case Studies Cr.Hrs. 6 -6.0
DENT 4030 General Practice Clinics Cr.Hrs. 30 -30.0

NET CHANGE IN CREDIT HOURS: -48.0

Dental Diagnostic and Surgical Sciences

Deletions:

DDSS 1020 Periodontology Cr.Hrs. 6 -6.0
DDSS 1140 Radiology 1 Cr.Hrs. 6 -6.0
DDSS 2010 Oral Pathology Cr.Hrs. 6 -6.0
DDSS 2020 Pain and Anxiety Control 1 Cr.Hrs. 6 -6.0
DDSS 2120 Periodontology 2 Cr.Hrs. 6 -6.0
DDSS 2180 Radiology 2 Cr.Hrs. 6 -6.0
DDSS 3030 Medicine Cr.Hrs. 6 -6.0
DDSS 3190 Temporomandibular Disorder and Orofacial Pain Cr.Hrs. 6 -6.0
DDSS 3200 Oral Diagnosis and Radiology Cr.Hrs. 6 -6.0
DDSS 3210 Oral and Maxillofacial Surgery Cr.Hrs. 6 -6.0
DDSS 3220 Periodontology 3 Cr.Hrs. 6 -6.0
DDSS 3230 Pain and Anxiety Control 2 Cr.Hrs. 6 -6.0
DDSS 4130 Hospital Dentistry Cr.Hrs. 6 -6.0
DDSS 4200 Oral Diagnosis and Radiology Cr.Hrs. 6 -6.0
DDSS 4210 Oral and Maxillofacial Surgery 2 Cr.Hrs. 6 -6.0

NET CHANGE IN CREDIT HOURS: -90.0

Oral Biology

Deletions:

ORLB 1050 Cell and Tissue Biology Cr.Hrs. 6	-6.0
ORLB 1060 Head, Neck, and Nervous System, Part I Cr.Hrs. 6	-6.0
ORLB 1070 Head, Neck, and Nervous System, Part II Cr.Hrs. 6	-6.0
ORLB 1080 Human Growth and Development Cr.Hrs. 6	-6.0
ORLB 1090 Development, Structure and Function of Oral Tissues Cr.Hrs. 6	-6.0
ORLB 2070 Structure and Function of Major Organ Systems Cr.Hrs. 6	-6.0
ORLB 2090 Cariology and Plaque Associated Diseases Cr.Hrs. 6	-6.0
ORLB 2100 Pathology and Microbiology 1 Cr.Hrs. 6	-6.0
ORLB 2150 Nutrition in Dentistry Cr.Hrs. 6	-6.0
ORLB 3020 Pathology and Microbiology 2 Cr.Hrs. 6	-6.0
ORLB 3060 Pharmacology and Dental Therapeutics Cr.Hrs. 6	-6.0

Modification:

ORLB 2330 Nutrition in Dentistry Cr.Hrs. 2	0.0
An examination of the fundamentals of nutrition and the relationship between nutrition and health within the context of the health professions. The focus is on nutritional strategies used to promote health and in the treatment of common health conditions. The primarily on-line content is followed up with a combination of oral health specific patient/clinical exercises for Dentistry students. May not be held with HNSC 2170 or HYGN 2370 or the former ORLB 2150 or the former PHRM 2420.	

NET CHANGE IN CREDIT HOURS: -66.0

Preventive Dental Science

PDSD 1020 Orthodontics 1 Cr.Hrs. 6	-6.0
PDSD 2020 Orthodontics 2 Cr.Hrs. 6	-6.0
PDSD 2070 Pediatric Dentistry 1 Cr.Hrs. 6	-6.0
PDSD 2130 Dental Public Health Cr.Hrs. 6	-6.0
PDSD 3040 Orthodontics 3 Cr.Hrs. 6	-6.0
PDSD 3050 Pediatric Dentistry 2 Cr.Hrs. 6	-6.0
PDSD 3140 Dental Public Health / Preventive Dental Science Cr.Hrs. 6	-6.0
PDSD 4050 Pediatric Dentistry 3 Cr.Hrs. 6	-6.0
PDSD 4060 Orthodontics 4 Cr.Hrs. 6	-6.0
PDSD 4080 Community Dentistry Externship Cr.Hrs. 6	-6.0

NET CHANGE IN CREDIT HOURS: -60.0

Restorative Dentistry

RSTD 1070 Dental Materials 1 Cr.Hrs. 6	-6.0
RSTD 1100 Operative Dentistry 1 Cr.Hrs. 6	-6.0
RSTD 1110 Dental Anatomy and Occlusion Cr.Hrs. 6	-6.0

RSTD 1120 Introduction to Dentistry Cr.Hrs. 6	-6.0
RSTD 1540 Introduction to Dentistry Cr.Hrs. 3	-3.0
RSTD 2020 Dental Materials Science 2 Cr.Hrs. 6	-6.0
RSTD 2050 Operative Dentistry 2 Cr.Hrs. 6	-6.0
RSTD 2060 Endodontology 1 Cr.Hrs. 6	-6.0
RSTD 2140 Fixed Partial Denture Prosthesis 1 Cr.Hrs. 6	-6.0
RSTD 2220 Removable Partial Denture Prosthodontics Cr.Hrs. 6	-6.0
RSTD 2230 Complete Denture Prosthodontics Cr.Hrs. 6	-6.0
RSTD 3020 Operative Dentistry 3 Cr.Hrs. 6	-6.0
RSTD 3040 Fixed Partial Denture Prosthesis 2 Cr.Hrs. 6	-6.0
RSTD 3050 Endodontology 2 Cr.Hrs. 6	-6.0
RSTD 3090 Complete and Removable Partial Denture Prosthesis Cr.Hrs. 6	-6.0
RSTD 4060 Endodontic Clinical Seminars Cr.Hrs. 6	-6.0
RSTD 4160 Dental Jurisprudence Cr.Hrs. 6	-6.0
RSTD 4170 Practice Management Cr.Hrs. 6	-6.0

NET CHANGE IN CREDIT HOURS: -105.0

Faculty of Education

Educational Administration, Foundations and Psychology

Program modification:

A modification to the **Post-Baccalaureate Diploma in Education** program is outlined on the next page:

University Calendar Changes

8.3 Program Requirements

REMINDER: While Education academic advisors are available to clarify faculty and university regulations and degree requirements, it is the student's responsibility to ensure that diploma and program requirements are met.

The Post Baccalaureate Diploma in Education consists of 30 credit hours of coursework, subject to the following regulations:

- a) A minimum of 12 credit hours must be taken in the Faculty of Education at the 5000-level;
- b) A maximum of 18 credit hours may be taken in the Faculty of Education below the 5000-level;
- c) A maximum of 18 credit hours may be taken outside the Faculty of Education at the introductory or higher level of which six credit hours may be taken at the 1000-level. In the case of language study other than English or French, a maximum of 12 credit hours may be taken at the 1000-level provided both are in the same language.
- d) ~~PBDE students are not permitted to take graduate courses.~~
- d) A maximum of six credit hours may be earned through approved external field-led courses. These courses are Faculty-approved courses offered by approved partner organizations. Prior approval through the 'Application for Letter of Permission' will be required before taking the courses and only students enrolled in the PBDE may take these courses.
- e) ~~PBDE students are not permitted to take graduate courses.~~

Faculty of Engineering

Biosystems Engineering

Introduction:

BIOE 2480 Impact of Engineering on Society Cr.Hrs.3 +3.0

Students will gain an understanding of overall sustainability of industrial activities, life-cycle and risk assessment techniques for sustainability, and design improvements to enhance environmental performance of engineered systems. This course will introduce basic methodologies for conducting environmental impact assessments, including physical, chemical, ecological, social and economic impacts. May not be held with the former BIOE 4480. Registration restricted to Biosystems Engineering students.

NET CHANGE IN CREDIT HOURS: +3.0

Program modification:

Modifications to the **Bachelor of Science in Engineering (Biosystems Engineering)** are outlined on the next pages.

Biosystems Engineering Courses Requirements

BIOL 1410	Anatomy of the Human Body	3
or		
SOIL 4060	Physical Properties of Soil	3
CHEM 1300	Structure and Modelling of Chemistry	3
CHEM 1310	University 1 Chemistry: An Introduction to Physical Chemistry	3
CIVL 4600	Technology, Society, and the Future	3
or		
ANTH 2430	Ecology, Technology and Society	3
or		
ANTH 2500	Culture, Environment, and Technology	3
CIVL 2790	Fluid Mechanics	4
or		
MECH 2262	Fundamentals of Fluid Mechanics	4
CIVL 2800	Solid Mechanics 1	4
or		
MECH 2222	Mechanics of Materials	4
CIVL 3710	Finite Element Analysis	4
CIVL 4050	Engineering Economics	3
COMP 1012	Computer Programming for Scientists and Engineers	3
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics	3
ENG 1450	Introduction to Electrical and Computer Engineering	3
ENG 1460	Introduction to Thermal Sciences	3
ENG 2022	Engineering CAD Technologies for Biosystems	3
ENGL 1400	Thematic Approaches to the Study of Literature (or equivalent)	3
MATH 1210	Techniques of Classical and Linear Algebra	3
MATH 1510	Applied Calculus 1 (or equivalent)	3
MATH 1710	Applied Calculus 2 (or equivalent)	3
MATH 2120	Introduction to Numerical Methods for Engineers	4
MATH 2130	Engineering Mathematical Analysis	3
MATH 2132	Engineering Mathematical Analysis 2	3
MBIO 1220	Essentials of Microbiology	3
or		
MBIO 1010	Microbiology	3
MECH 3482	Kinematics and Dynamics	4
PHIL 1290	Critical Thinking**	3
PHYS 1050	Physics 1: Mechanics	3
STAT 2220	Introduction to Probability and Statistics	3
BIOE 2110	Transport Phenomenon	3
BIOE 2480	Impact of Engineering on Society	3
BIOE 2580	Biosystems Engineering Design Trilogy 1	4
BIOE 2590	Biology for Engineers	3
BIOE 2600	Plant and Animal Physiology for Engineers	4
or		
BIOL 1412	Physiology of the Human Body	3
BIOE 3270	Instrumentation and Measurement for Biosystems	4
BIOE 3320	Engineering Properties of Biological Materials	4
BIOE 3400	Design of Structural Components in Machines	4
BIOE 3580	Biosystems Engineering Design Trilogy 2	4
BIOE 3590	Mechanics of Materials in Biosystems	4
BIOE 4240	Graduation Project	3
BIOE 4580	Biosystem Engineering Design Trilogy 3	4

Plus 2 Complementary Studies Electives.

Plus 4 Biosystems Engineering Design Electives.

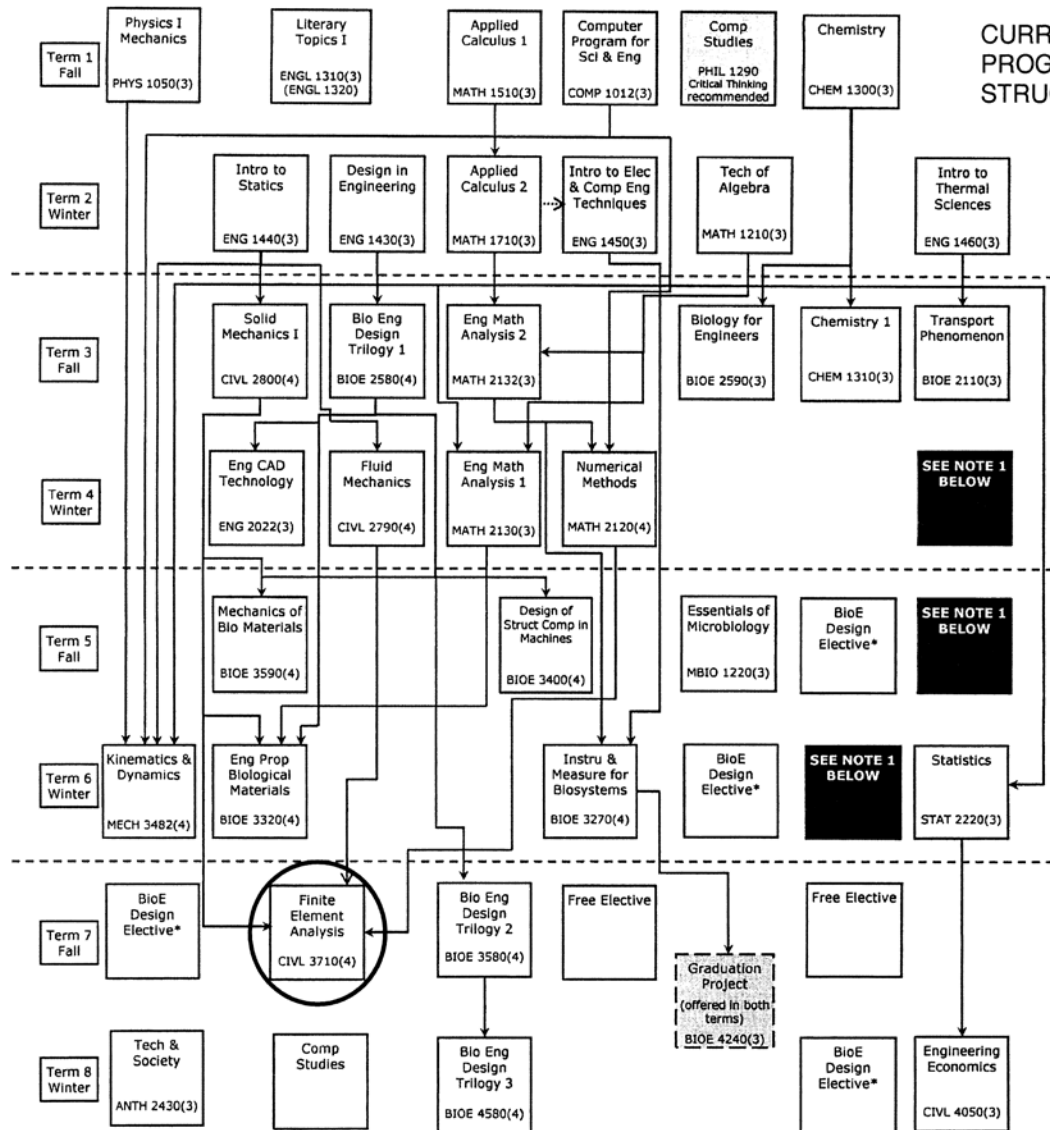
Plus 2 Free Electives

** PHIL 1290 Critical Thinking is the recommended complementary studies elective. However, students may select any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be held for credit within the Faculty of Engineering.

BIOSYSTEMS ENGINEERING: EXAMPLE OF AN 8-TERM PROGRAM

*Pre- and co-requisites for Biosystems Engineering Science and Design Electives are dependent on course selection

CURRENT PROGRAM STRUCTURE



Biosystems Engineering Design Electives

Fall Term - Odd Years

BIOE 4412 Design of Light-Frame Building Systems (BIOE 2110, BIOE 3590)
BIOE 4414 Imaging and Spectroscopy for Biosystems (BIOE 3270)

Fall Term - Even Years

BIOE 4440 Bioprocessing for biorefining (BIOE 2110)
BIOE 4620 Remediation Eng (CIVL 2790 or MECH 2260 or MECH 2262)
BIOE 4700 Alternative Building Design (BIOE 3590)

NOTE 1: Choose one of the two options:

Option 1: BIOL 1410(F)
BIOL 1412(W) (prereq: BIOL 1410)
Comp Studies Elect

OR

Option 2: BIOE 2600(W) (rereq: BIOE 2590)
SOIL 4060(W) (rereq: BIOE 2110)
Comp Studies Elect

Biosystems Engineering Design

Winter Term - Even Years

BIOE 4390 Unit Operations 1 (CIVL 2790 or MECH 2262)
BIOE 4590 Mgt of By-Products from An Prod (CIVL 2790 or MECH 2260 or MECH 2262)
BIOE 4460 Air Pollution Assess & Mgt (CIVL 2790 or CIVL 3610 or MECH 2260 or MECH 2262)
BIOE 4600 Design of Water Mgt Systems (SOIL 4060 or CIVL 3730)
BIOE 4610 Design of Assistive Technology Devices (BIOL 1412 or ZOOL 1330)

Winter Term - Odd Years

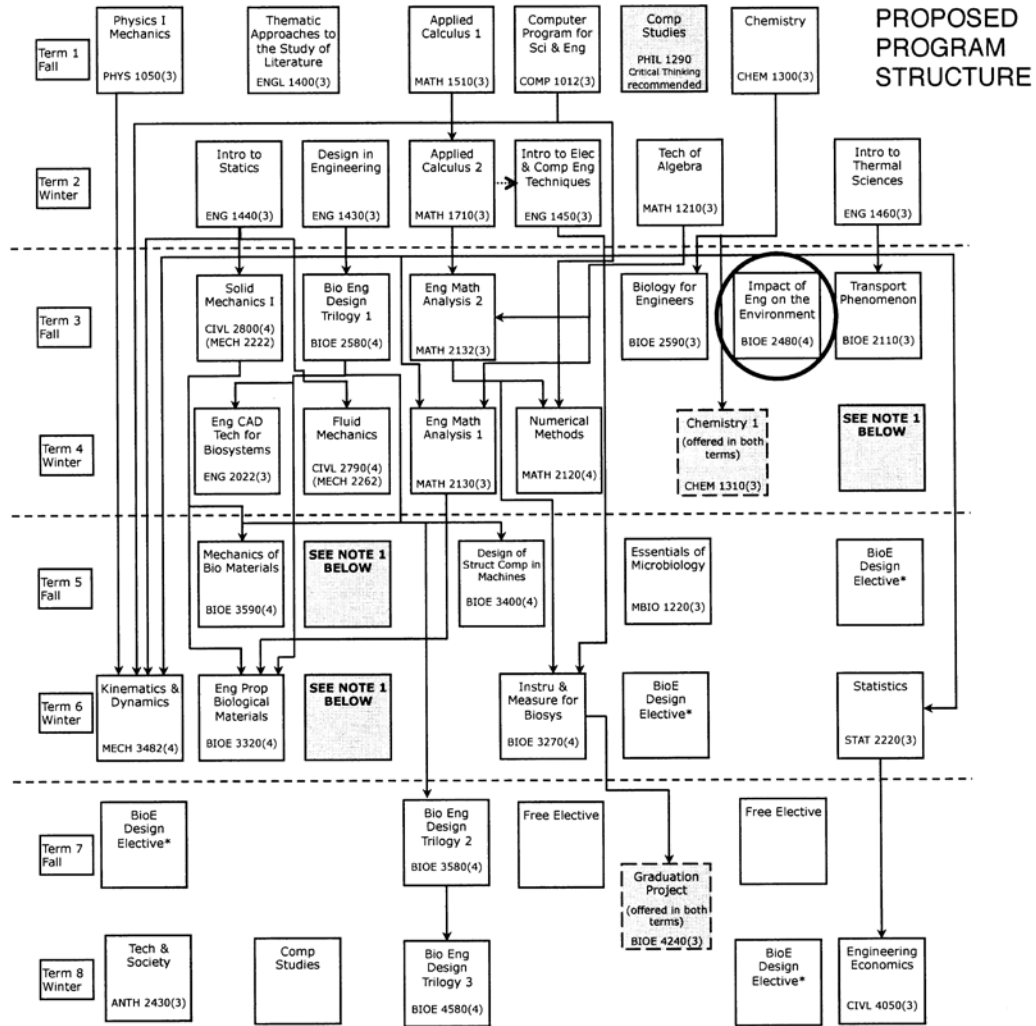
BIOE 4420 Crop Preservations (BIOE 2110)
BIOE 4560 Structural Design in Wood (BIOE 3590 or CIVL 3770)
BIOE 4640 Bioeng Applic in Medicine (BIOL 1410 or ZOOL 1320, BIOL 1412 or ZOOL 1330, BIOE 3320)

→ prerequisite - - - - - corequisite

Revised: February 9, 2015

BIOSYSTEMS ENGINEERING: EXAMPLE OF AN 8-TERM PROGRAM

*Pre- and co-requisites for Biosystems Engineering Science and Design Electives are dependent on course selection



Biosystems Engineering Design Electives

Fall Term – Odd Years

BIOE 4390 Unit Operations 1 (CIVL 2790 or MECH 2262)
BIOE 4600 Design of Water Mgt Systems (SOIL 4060 or CIVL 3730)
BIOE 4610 Design of Assistive Technology Devices (BIOL 1412 or ZOOL 1330)

Fall Term – Even Years

BIOE 4440 Bioprocessing for biorefining (BIOE 2110)
BIOE 4620 Remediation Eng (CIVL 2790 or MECH 2260 or MECH 2262)
BIOE 4700 Alternative Building Design (BIOE 3590)

NOTE 1: Choose one of the two options:

Option 1: BIOL 1410(F)
BIOL 1412(W) (prereq: BIOL 1410)
Comp Studies Elect

OR

Option 2: BIOE 2600(W) (rereq: BIOE 2590)
SOIL 4060(W) (rereq: BIOE 2110)
Comp Studies Elect

Biosystems Engineering Design

Winter Term – Even Years

BIOE 4412 Design of Light-Frame Building Systems (BIOE 2110, BIOE 3590)
BIOE 4414 Imaging and Spectroscopy for Biosystems (BIOE 3270)
BIOE 4590 Mgt of By-Products from An Prod (CIVL 2790 or MECH 2260 or MECH 2262)

Winter Term – Odd Years

BIOE 4420 Crop Preservations (BIOE 2110)
BIOE 4460 Air Pollution Assess & Mgt (CIVL 2790 or CIVL 3610 or MECH 2260 or MECH 2262)
BIOE 4560 Structural Design in Wood (BIOE 3590 or CIVL 3770)
BIOE 4640 Bioeng Applic in Medicine (BIOL 1410 or ZOOL 1320, BIOL 1412 or ZOOL 1330, BIOE 3320)

→ prerequisite

---> corequisite

Civil Engineering

Modification:

CIVL 4460 Technology, Society and the Future. Cr. Hrs. 3 0.0
(Formerly 023.446) Impact of technology and technological change on society - past, present, future; specific technologies, e.g. construction, machine power, computers, communications, medical, military: the process of technological change; invisible effects of technology; technology and resource use; sustainable development, limits to growth and the role of technology. Prerequisite: A grade of "C" or better in ENGL 1400 or ENGL 1200 or ENGL 1300 or the former ENGL 1310 or the former ENGL 1320 or ENGL 1340 (or equivalent).

NET CHANGE IN CREDIT HOURS: 0.0

Program modification:

Modifications to the **Bachelor of Science in Engineering (Civil)** are outlined on the next page.

Civil Engineering Courses Requirements

CHEM 1300	Structure and Modelling of Chemistry	3
CHEM 1310	University 1 Chemistry: An Introduction to Physical Chemistry	3
COMP 1012	Computer Programming for Scientists and Engineers	3
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics	3
ENG 1450	Introduction to Electrical and Computer Engineering	3
ENG 1460	Introduction to Thermal Sciences	3
ENG 2010	Technical Communications	3
ENG 2030	Engineering Communication: Strategies for the Profession	3
or		
ENG 2040	Engineering Communication: Strategies, Practice, and Design	3
ENGL 1400	Thematic Approaches to the Study of Literature (or equivalent)	3
GEOL 2250	Geology for Engineers	4
MATH 1210	Techniques of Classical and Linear Algebra	3
MATH 1510	Applied Calculus 1 (or equivalent)	3
MATH 1710	Applied Calculus 2 (or equivalent)	3
MATH 2130	Engineering Mathematical Analysis	3
MATH 2132	Engineering Mathematical Analysis 2	3
PHIL 1290	Critical Thinking**	3
PHYS 1050	Physics 1: Mechanics	3
STAT 2220	Introduction to Probability and Statistics	3
CIVL 2770	Civil Engineering Materials	5
CIVL 2780	Civil Engineering Systems	4
CIVL 2790	Fluid Mechanics	4
CIVL 2800	Solid Mechanics 1	4
CIVL 2830	Graphics for Civil Engineers	2
CIVL 2840	Civil Engineering Geomatics	3
CIVL 3590	Numerical Methods for Engineers	4
CIVL 3690	Environmental Engineering Analysis	4
CIVL 3700	Environmental Engineering Design	4
CIVL 3730	Geotechnical Materials and Analysis	4
CIVL 3740	Hydraulics	4
CIVL 3750	Hydrology	4
CIVL 3760	Structural Analysis	4
CIVL 3770	Structural Design 1	4
CIVL 3790	Transportation Engineering	4
CIVL 4050	Engineering Economics	3
CIVL 4220	Geotechnical Design	4
CIVL 4380	Infrastructure Engineering and Construction Management	4
CIVL 4390	Structural Design 2	4
CIVL 4400	Transportation Engineering 2	4
CIVL 4460	Technology, Society and the Future	3
CIVL 4590	Design Project	6

Plus 1 Complementary Studies Electives. (PHIL 2750 required for Environmental Option.)

Plus 5 Technical Electives from the approved list.

** PHIL 1290 Critical Thinking is the recommended complementary studies elective. However, students may select any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be held for credit within the Faculty of Engineering.

20 February 2015

Electrical and Computer Engineering

Modification:

ECE 3580 Foundations of Electromagnetics Cr.Hrs. 4 0.0
(Formerly ECE 2130) Fundamental laws of field theory; Maxwell's equations in integral and point form. Prerequisite: ECE 2240, PHYS 2152, and MATH 3132 (MATH 3100).

NET CHANGE IN CREDIT HOURS: 0.0

Program modification:

Modifications to the **Bachelor of Science in Engineering (Computer)** are outlined on the next page.

Computer Engineering Courses Requirements

ANTH 2430	Ecology, Technology and Society	3
CHEM 1300	Structure and Modelling of Chemistry	3
CIVL 4050	Engineering Economics	3
COMP 1012	Computer Programming for Scientists and Engineers	3
COMP 1020	Computer Science 2	3
COMP 2140	Data Structures and Algorithms	3
COMP 3430	Operating Systems	3
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics	3
ENG 1450	Introduction to Electrical and Computer Engineering	3
ENG 1460	Introduction to Thermal Sciences	3
ENG 2010	Technical Communications	3
ENG 2030	Engineering Communication: Strategies for the Profession	3
or		
ENG 2040	Engineering Communication: Strategies, Practice, and Design	3
ENGL 1400	Thematic Approaches to the Study of Literature (or equivalent)	3
MATH 1210	Techniques of Classical and Linear Algebra	3
MATH 1510	Applied Calculus 1 (or equivalent)	3
MATH 1710	Applied Calculus 2 (or equivalent)	3
MATH 2130	Engineering Mathematical Analysis	3
MATH 2132	Engineering Mathematical Analysis 2	3
MATH 3120	Applied Discrete Mathematics	3
MATH 3132	Engineering Mathematical Analysis 3	3
PHIL 1290	Critical Thinking**	3
PHYS 1050	Physics 1: Mechanics	3
PHYS 2152	Modern Physics for Engineers	3
STAT 2220	Introduction to Probability and Statistics	3
ECE 2160	Electronics 2E	5
ECE 2220	Digital Logic Systems	5
ECE 2262	Electric Circuits	4
ECE 3610	Microprocessor Systems	4
ECE 3670	Electronics 3E	4
ECE 3700	Telecommunication Network Engineering	4
ECE 3740	Systems Engineering Principles 1	4
ECE 3760	Digital Systems Design 1	4
ECE 3780	Signal Processing 1	4
ECE 3790	Engineering Algorithms	4
ECE 4150	Control Systems	4
or		
ECE 4260	Communication Systems	4
ECE 4240	Microprocessor Interfacing	4
ECE 4830	Signal Processing 2	4
ECE 4600	Group Design Project	6

Plus 1 Complementary Studies Electives.

Plus 2 Natural Science Electives from the approved list.

Plus 4 Technical Electives from the approved list.

** PHIL 1290 Critical Thinking is the recommended complementary studies elective. However, students may select any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be held for credit within the Faculty of Engineering.

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Modifications to the **Bachelor of Science in Engineering (Electrical)** are outlined on the next pages.

Electrical Engineering Courses Requirements

ANTH 2430	Ecology, Technology and Society	3
CHEM 1300	Structure and Modelling of Chemistry	3
CIVL 4050	Engineering Economics	3
COMP 1012	Computer Programming for Scientists and Engineers	3
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics	3
ENG 1450	Introduction to Electrical and Computer Engineering	3
ENG 1460	Introduction to Thermal Sciences	3
ENG 2010	Technical Communications	3
ENG 2030	Engineering Communication: Strategies for the Profession	3
or		
ENG 2040	Engineering Communication: Strategies, Practice, and Design	3
ENGL 1400	Thematic Approaches to the Study of Literature (or equivalent)	3
MATH 1210	Techniques of Classical and Linear Algebra	3
MATH 1510	Applied Calculus 1 (or equivalent)	3
MATH 1710	Applied Calculus 2 (or equivalent)	3
MATH 2130	Engineering Mathematical Analysis	3
MATH 2132	Engineering Mathematical Analysis 2	3
MATH 3132	Engineering Mathematical Analysis 3	3
PHIL 1290	Critical Thinking**	3
PHYS 1050	Physics 1: Mechanics	3
PHYS 2152	Modern Physics for Engineers	3
STAT 2220	Introduction to Probability and Statistics	3
ECE 2160	Electronics 2E	5
ECE 2220	Digital Logic Systems	5
ECE 2240	Numerical Methods for Electrical Engineers	4
ECE 2262	Electric Circuits	4
ECE 3540	Advanced Circuit Analysis and Design	4
ECE 3580	Foundations of Electromagnetics	4
ECE 3590	Electromagnetic Theory	4
ECE 3600	Physical Electronics	4
ECE 3610	Microprocessor Systems	4
ECE 3670	Electronics 3E	4
ECE 3720	Electric Power and Machines	4
ECE 3730	Principles of Embedded Systems Design	4
ECE 3780	Signal Processing 1	4
ECE 4150	Control Systems	4
ECE 4260	Communication Systems	4
ECE 4600	Group Design Project	6

Plus 1 Complementary Studies Elective.

Plus 1 Natural Science from the approved list of electives.

Plus 7 Technical Electives from the approved list.

** PHIL 1290 Critical Thinking is the recommended complementary studies elective. However, students may select any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be held for credit within the Faculty of Engineering.

Electrical Engineering: Standard Program Electrical Electives

Program Requirements:

In the standard Electrical Engineering program, seven Technical Elective Courses are required. At least 4 must be taken from the Group A list shown below. The remainder can be either from the below Group A or B lists.

GROUP A TECHNICAL ELECTIVE COURSES: (4 required)

- ECE 3650 Electric Machines
- ECE 4100 Microelectronic Fabrication
- ECE 4140 Power Transmission Lines
- ECE 4160 Control Engineering
- ECE 4180 Introduction to Robotics
- ECE 4200 Electric Filter Design
- ECE 4250 Digital Communications
- ECE 4270 Antennas
- ECE 4280 Engineering Electromagnetics
- ECE 4290 Microwave Engineering
- ECE 4300 Electrical Energy Systems 1
- ECE 4310 Electrical Energy Systems 2
- ECE 4360 High Voltage Engineering
- ECE 4370 Power Electronics
- ECE 4390 Engineering Computations 3E
- ECE 4420 Digital Control
- ECE 4580 Optoelectronics
- ECE 4610 Biomedical Engineering and Instrumentation
- ECE 4830 Signal Processing 2
- ECE 4860 Biomedical Optics
- ECE 4860 Design of RF Devices and Wireless Systems

GROUP B TECHNICAL ELECTIVE COURSES:

- ECE 3700 Telecom Networking
- ECE 3760 Digital System Design 1
- ECE 3770 Digital System Design 2
- ECE 4240 Microprocessor Interfacing
- ECE 4440 Computer Vision
- ECE 4520 Simulation & Modelling
- ECE 4530 Parallel Processing
- ECE 4540 Wireless Networks
- ECE 4740 Digital System Implementation
- ECE 4850 Performance Evaluation for Communications & Computer Eng.
- ECE 4860 Materials Characterization
- COMP 2140 Data Structures and Algorithms
- COMP 3190 Intro. Artificial Intelligence
- COMP 4180 Intelligent Mobile Robotics
- COMP 4360 Machine Learning
- MATH 3120 Applied Discrete Mathematics
- ~~MATH 3700 Applied Complex Analysis~~
- MATH 3340 Complex Analysis 1**
- ~~MATH 3810 Partial Differential Equations 2~~
- MATH 3460 Partial Differential Equations**
- PHYS 2260 Optics
- PHYS 3220 Medical Physics and Physiological Measurement
- PHYS 3640 Electro- and Magnetodynamics and Special Relativity
- PHYS 4590 Advanced Optics

Mechanical Engineering

Program modification:

Modifications to the **Bachelor of Science in Engineering (Mechanical)** are described on the next page.

Mechanical Engineering Courses Requirements

ANTH 2430	Ecology, Technology and Society (B)	3
or		
CIVL 4460	Technology, Society, and the Future	3
CHEM 1300	Structure and Modelling of Chemistry	3
CHEM 1310	University 1 Chemistry: An Introduction to Physical Chemistry	3
CIVL 4050	Engineering Economics	3
COMP 1012	Computer Programming for Scientists and Engineers	3
ECE 3010	Elements of Electric Machines and Digital Systems	4
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics	3
ENG 1450	Introduction to Electrical and Computer Engineering	3
ENG 1460	Introduction to Thermal Sciences	3
ENG 2010	Technical Communications	3
ENG 2030	Engineering Communication: Strategies for the Profession	3
or		
ENG 2040	Engineering Communication: Strategies, Practice, and Design	3
ENGL 1400	Thematic Approaches to the Study of Literature (or equivalent)	3
MATH 1210	Techniques of Classical and Linear Algebra	3
MATH 1510	Applied Calculus 1 (or equivalent)	3
MATH 1710	Applied Calculus 2 (or equivalent)	3
MATH 2120	Introduction to Numerical Methods for Engineers	3
MATH 2130	Engineering Mathematical Analysis	3
MATH 2132	Engineering Mathematical Analysis 2	3
MATH 3132	Engineering Mathematical Analysis 3	3
PHIL 1290	Critical Thinking**	3
PHYS 1050	Physics 1: Mechanics	3
PHYS 1070	Physics 2: Waves and Modern Physics	3
STAT 2220	Introduction to Probability and Statistics	3
MECH 2012	Computer Aided Design and Manufacturing Processes	4
MECH 2202	Thermodynamics	4
MECH 2222	Mechanics of Materials	4
MECH 2262	Fundamentals of Fluid Mechanics	4
MECH 2272	Engineering Materials 1	4
MECH 3170	Project Management	4
MECH 3420	Vibrations and Acoustics	4
MECH 3430	Measurements and Control	4
MECH 3460	Heat Transfer	4
MECH 3482	Kinematics and Dynamics	4
MECH 3492	Fluid Mechanics and Applications	4
MECH 3502	Stress Analysis and Design	4
MECH 3542	Engineering Materials 2	4
MECH 3980	Mechanical Engineering Laboratory (full year)	4
MECH 4650	Machine Design 4M	4
MECH 4860	Engineering Design	5

Plus 1 Complementary Studies Elective.

Plus 5 Technical Electives from the approved list.

** PHIL 1290 Critical Thinking is the recommended complementary studies elective. However, students may select any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be held for credit within the Faculty of Engineering.

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Faculty of Engineering

Deletion:

ENG 2010 Technical Communications Cr.Hrs. 3 -3.0

Introductions:

ENG 2030 Engineering Communication: Strategies for the Profession Cr.Hrs. 3 +3.0

Students work in a team-based environment to produce deliverables comparable to the engineering workplace. In-class tutorials focus on the sharpening of individual students' writing skills through an analytical, problem-solving and critical thinking approach. Students are exposed to a variety of communicative scenarios and emphasis is placed on development of a repertoire of skills necessary for effective communication in the engineering profession. Not to be held with the former ENG 2010. Prerequisites: (ENGL 1200 or ENGL 1300 or the former ENGL 1310 or ENGL 1340 or ENGL 1400) and ENG 1430.

ENG 2040 Engineering Communication: Strategies, Practice and Design +3.0

This team-based course focuses on a rhetorical approach, communication strategies and guided practice in the design of engineering communications. Not to be held with the former ENG 2010. Prerequisites: (ENGL 1200 or ENGL 1300 or the former ENGL 1310 or ENGL 1340 or ENGL 1400) and ENG 1430.

Modifications:

ENG 1430 Design in Engineering Cr.Hrs. 3 0.0

The creative process; the design process; working in a team. The engineering profession from the perspective of students and professionals. Academic, legal and ethical considerations. Prerequisites: A minimum grade of 60% in Pre-Calculus Mathematics 40S (or a minimum grade of "C" in MATH SKILLS) and Physics 40S (or passing grade in PHYS 0900 or minimum grade of "C" in PHYS 1050) and Chemistry 40S (or passing grade in CHEM 0900 or minimum grade of "C" in CHEM 1300) or their equivalents.

ENG 1440 Introduction to Statics Cr.Hrs. 3 0.0

Statics of particles; rigid bodies, equilibrium of rigid bodies; analysis of structures; distributed forces. Not to be held with ENG 1441. Prerequisites: A minimum grade of 60% in Pre-Calculus Mathematics 40S (or a minimum grade of "C" in MATH SKILLS) and Physics 40S (or passing grade in PHYS 0900 or minimum grade of "C" in PHYS 1050) and Chemistry 40S (or passing grade in CHEM 0900 or minimum grade of "C" in CHEM 1300) or their equivalents.

ENG 1450 Introduction to Electrical and Computer Engineering. Cr.Hrs. 3. 0.0

Part I; Current, voltage, energy, potential, power Ohm's law; independent sources; capacitor, inductor, ideal diode, op-amp; Kirchoff's law; simple circuits (Resistive, RC, RL, OP-Amp; Diode); introduction to ac theory (Sinusoidal waveform, phase relations of voltage and current waveforms for R,L,C. RL and RC circuits). Part II; Applications (Digital Logic, motors). Prerequisites: A minimum grade of 60% in Pre-Calculus Mathematics 40S (or a minimum grade of "C" in MATH SKILLS) and Physics 40S (or passing grade in PHYS 0900 or minimum grade of "C" in PHYS 1050) and Chemistry 40S (or passing grade in CHEM 0900 or minimum grade of "C" in CHEM 1300) or their equivalents.

ENG 1460 Introduction to Thermal Sciences. Cr.Hrs. 3. 0.0
Properties of pure substances; first law for closed systems; first law for open systems; second law; examples of power cycles and refrigeration cycles. Prerequisites: A minimum grade of 60% in Pre-Calculus Mathematics 40S (or a minimum grade of "C" in MATH SKILLS) and Physics 40S (or passing grade in PHYS 0900 or minimum grade of "C" in PHYS 1050) and Chemistry 40S (or passing grade in CHEM 0900 or minimum grade of "C" in CHEM 1300) or their equivalents.

NET CHANGE IN CREDIT HOURS: +3.0

Program modification:

Modifications to the **Preliminary Engineering Program** are set out on the next page.

4.2 Preliminary Engineering Program

Student Advising Office: E1-284 EITC

Telephone: 204 474 9807

E-mail: eng_info@umanitoba.ca

Website: umanitoba.ca/faculties/engineering

The Preliminary Engineering Program is common to all programs in engineering. Students in the direct entry engineering program or University 1 must complete a minimum of 8 courses to be admitted to a degree granting engineering program. A student must complete the following list of 12 courses in order to graduate with a B.Sc. degree from any of the engineering programs.

Course No.	Course Name	Credit Hours
CHEM 1300	Structure and Modelling in Chemistry	3
COMP 1012	Computer Programming for Scientists and Engineers	3
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics	3
ENG 1450	Introduction to Electrical and Computer Engineering	3
ENG 1460	Introduction to Thermal Sciences	3
ENGL 1310	Literary Topics 1 (Note 5)	3
ENGL 1400	Thematic Approaches to the Study of Literature (or equivalent) (Note 5)	3
MATH 1210	Techniques of Classical and Linear Algebra (Note 4)	3
MATH 1510	Applied Calculus 1 (or equivalent) (Notes 1 and 3)	3
MATH 1710	Applied Calculus 2 (or equivalent) (Notes 2 and 3)	3
PHIL 1290*	Critical Thinking	3
PHYS 1050	Physics 1: Mechanics	3

*PHIL 1290 Critical Thinking is the recommended complementary studies elective. However, students may select any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be held for credit within the Faculty of Engineering.

Note:

(1) MATH 1500 and MATH 1510 are regarded as equivalent to each other.

(2) MATH 1700 and MATH 1710 are regarded as equivalent to each other.

(3) MATH 1690 may be regarded as being equivalent to one course from (1) and one course from (2).

(4) MATH 1300 is not an acceptable equivalent to MATH 1210.

~~(5) ENGL 1400 to replace ENGL 1310, NEW as of Sept. 2014; ENGL 1200, ENGL 1300, ENGL 1340 may be accepted for credit in lieu of ENGL 1310.~~

(5) ENGL 1200, ENGL 1300, the former ENGL 1310, or ENGL 1340 may held in lieu of ENGL 1400.

University Written English and Mathematics Requirements

All students are required to complete the university written English and mathematics requirement within the first 60 credit hours of their program. This requirement is described in the chapter General Academic Regulations and Requirements of this Calendar. In the Engineering programs the mathematics requirement is satisfied by one of MATH 1510 or MATH 1710 (or an equivalent); the written English requirement is satisfied by ~~ENGL 1310~~ **ENGL 1400** (or an equivalent).

Faculty of Environment, Earth, and Resources

Environment and Geography

Deletions:

GEOG 2210 Economic Geography Cr.Hrs. 6	-6.0
GEOG 2250 Introduction to Geographic Information Systems Cr.Hrs. 3	-3.0
GEOG 3330 Population Issues in the Developing World Cr.Hrs. 3	-3.0
GEOG 3480 Canadian Problems Cr.Hrs. 3	-3.0
GEOG 3520 Energy and Society Cr.Hrs. 6	-6.0
GEOG 3540 Regional Development Planning: Theory and Practice Cr.Hrs. 6	-6.0
GEOG 3580 Landforms Cr.Hrs. 6	-6.0
GEOG 3590 Geography of Developing Countries Cr.Hrs. 6	-6.0
GEOG 3800 Geography of Transportation Development Cr.Hrs. 3	-3.0
GEOG 3900 Geography of Manitoba Cr.Hrs. 3	-3.0
GEOG 4410 Rural Land Use Cr.Hrs. 3	-3.0
GEOG 4550 Topics in Air Pollution: Climatology, Location, and Planning Cr.Hrs. 3	-3.0
GEOG 4580 Concepts and Methods in Geography Cr.Hrs. 6	-6.0
GEOG 4590 Spatial Analysis Cr.Hrs. 3	-3.0
GEOG 4720 Advanced Methods in Geographic Information Systems Cr.Hrs. 3	-3.0

Introductions:

ENVR 4872 Advanced Methods in Geomatics Cr.Hrs. 3	+3.0
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(Lab required) This course focuses on the theory and application of geomatics in spatial problem solving in geography and the environment. The use of geomatics' technologies including GIS, Earth observation and spatial numerical methods will be covered. Students will learn the theoretical underpinning of spatial statistical concepts and will experiment with data exploration, inference and hypothesis testing. Lab assignments will provide practical experience with GIS and other geomatics software as well as CRAN-R. Not to be held with GEOG 4590, GEOG 4720 or GEOG 4872. Prerequisite: GEOG 3730 or permission of Instructor.

GEOG 1700 Social Justice in the 21 st Century: Global Political Economy and Environmental Change Cr.Hrs. 3	+3.0
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Introduces students to political economy and cultural geography through the close analysis of contemporary world events, including but not limited to instances of violent conflict, environmental change, international negotiations, political processes and events, social movements, and policy developments. A multimedia approach will advance students' understanding of geopolitical events from political economy and spatial perspectives. Specific content of the course will change year-by-year in response to developments in national and world politics. Also offered by Faculty of Arts as GPE 1700. Students may not hold credit for both GPE 1700 and GEOG 1700.

GEOG 2930 Introduction to Oceanography Cr.Hrs. 3	+3.0
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This course provides an introduction to the physical, chemical, biological and geological processes in the world oceans and their interactions with the overall Earth system. This course is interdisciplinary, applying geological, chemical and biological processes to the study of the world's oceans. Prerequisite: A minimum grade of "C" in GEOG 1290 (or GEOG 1291) or GEOG 1200 (or GEOG 1201) or ENVR 1000 or GEOL 1340.

GEOG 3920 Biological Oceanography I: Lower Trophic Levels Cr.Hrs. 3 +3.0

In this course, students will gain a background on the study of biological oceanography. Biological oceanography is a very active and important field of study worldwide due to the spatial coverage and biological activity of the world's oceans. This course examines the interaction of marine organisms with other biological life, as well as with the physical environment. Prerequisite: A minimum grade of "C" in both GEOG 2930 and BIOL 1030.

GEOG 4872 Advanced Methods in Geomatics Cr.Hrs. 3 +3.0

(Lab required) This course focuses on the theory and application of geomatics in spatial problem solving in geography and the environment. The use of geomatics' technologies including GIS, Earth observation and spatial numerical methods will be covered. Students will learn the theoretical underpinning of spatial statistical concepts and will experiment with data exploration, inference and hypothesis testing. Lab assignments will provide practical experience with GIS and other geomatics software as well as CRAN-R. Not to be held with ENVR 4872, GEOG 4590 or GEOG 4720. Prerequisite: GEOG 3730 or permission of Instructor.

Modifications:

ENVR 2270 Environmental Problem Solving and Scientific Thinking Cr.Hrs. 3 0.0

A course to help students develop skeptical and scientific thinking around environmental issues and problems. A multi-disciplinary approach will be taken, using current topical issues as examples. Not to be held with ENVR 2170. Prerequisite: ENVR 1000 or equivalent (C), or permission of instructor.

ENVR 3160 Environmental Responsibilities and the Law Cr.Hrs. 3 0.0

Environmental responsibilities and their legal framework in terms of policies, legislation, standards and guidelines and the tools to manage responsibility are examined through lectures, case study review and discussion. Environmental liability and due diligence are reviewed in relation to responsibilities of organizations and individuals. Strategies to manage environmental liabilities, including environmental and risk assessment are also discussed. Not to be held with ENVR 2650 or ENVR 3150. Prerequisite: ENVR 2000 (C) or permission of department head.

ENVR 3250 Environmental Assessment Cr.Hrs. 3 0.0

(Lab required) The theory, principles and practices of environmental assessment as a planning and decision-making process to identify and mitigate adverse effects of development projects. Environmental assessment is defined in the context of federal and provincial legislation, and applicable standards and guidelines. Laboratory assignments involve practical experiences, case study review and basic report preparation. Prerequisites: A grade of "C" or better in [ABIZ 3550 (061.355) or ENVR 3160 or the former ENVR 3150] and [BIOL 2300 or BIOL 2301 or the former BOTN 2370 or the former BOTN 2371 or the former ZOOL 2370 or the former ZOOL 2371 or AGECE 2370] or [BIOL 2390 or the former BOTN 2280 or the former ZOOL 2290] or permission of department head.

GEOG 3730 Geographic Information Systems (TS) Cr.Hrs. 3 0.0

(Lab Required) Weekly lab. The course introduces students to the evolving science, technology and applications of Geographic Information Systems (GIS). Related geospatial technologies such as Global Navigation Satellite Systems and Remote Sensing, as well as the field of Geomatics will be introduced. Prerequisite: a grade of "C" or better in a minimum of three credit hours from Geography, Geology or Environment courses numbered at the 1000 and/or 2000 level, or permission of instructor or department head. Not to be held with GEOG 2250

GEOG 3870 Food Geographies Cr.Hrs. 3

0.0

This course provides a critical examination of the geographies of food at a variety of scales, from the body to the global. The course focuses on themes in three interconnected areas: 1) food production and the global food system from farm to plate including agribusiness and alternative food production and distribution models; 2) food consumption habits and beliefs and foodways as geographically contingent material culture; and 3) food (in) security and its relationship to health and wellbeing. This course is cross-listed as HNSC 3870. May not be held with HNSC 3870. Prerequisite: a grade of C or better in GEOG 1280 or GEOG 1281 or HNSC 1200 or permission of department head.

NET CHANGE IN CREDIT HOURS: -48.0

Program modifications:

Modifications to the following programs are outlined on the next pages:

- **Bachelor of Arts (Honours) in Geography**
- **Bachelor of Arts (Advanced) in Geography**
- **Bachelor of Arts (General) in Geography**
- **Minor in Geography**

5.5 B.A. Geography Program Chart

5.5 B.A. Geography ⁶ Geography ⁵			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS¹ 120 CREDIT HOURS (69 credit hours in Geography)			
6 credit hours from GEOG 1280, and GEOG 1290 and/or GEOG 1700 Plus 6 credit hours of Humanities ⁶ Plus 6 credit hours from the Faculty of Science	GEOG 2200, GEOG 2250, GEOG 2530 9 credit hours in Geography courses numbered at the 2000- or 3000-level ⁴ level ³ 12-credit hours in ancillary options ³	GEOG 3730, GEOG 3810 Plus 18 credit hours in Geography courses numbered at the 2000- or 3000-level ⁴ level ³ 9-credit hours in ancillary options ³	GEOG 4660 18 credit hours in Geography courses numbered at the 4000-level 6-credit hours in ancillary options ³
It is recommended that students complete the W course within the first 60 credit hours of courses. Enough elective credit to total 120 credit hours for the program.			
ADVANCED¹ 120 CREDIT HOURS (51 credit hours in Geography)			
6 credit hours from GEOG 1280 and GEOG 1290 and/or GEOG 1700 Plus 6 credit hours of Humanities ⁶ Plus 6 credit hours from the Faculty of Science	GEOG 2200, GEOG 2250, GEOG 2530 9 credit hours in Geography courses numbered at the 2000- or 3000-level ⁴ level ³	GEOG 3730, GEOG 3810 Plus 6 credit hours in Geography courses numbered at the 3000-level ⁵ level ⁴	12 credit hours in Geography courses numbered at the 4000-level Plus 6 additional credit hours in Geography at the 2000-level or above
It is recommended that students complete the W course within the first 60 credit hours of courses. Enough elective credit to total 120 credit hours for the program.			
GENERAL² 90 CREDIT HOURS (30 credit hours in Geography)			
6 credit hours from GEOG 1280 and GEOG 1290 and/or GEOG 1700 Plus 6 credit hours of Humanities ⁶	12 credit hours in Geography courses numbered at the 2000-level ⁶ level ⁴	12 credit hours in Geography courses numbered at the 3000- and/ or 4000-level ⁶ level ⁴	

Plus 6 credit hours from the Faculty of Science			
It is recommended that students complete the W and M courses within the first 60 credit hours of courses. Note: 30 credit hours, with 6 credit hours in each of 5 subject fields, must be completed in the first 60 credit hours. Enough elective credit to total 90 credit hours for the program.			
MINOR 18 CREDIT HOURS			
6 credit hours from GEOG 1280 and GEOG 1290 and/or GEOG 1700	6 credit hours in Geography courses numbered at the 2000-level	6 credit hours in Geography courses numbered at the 3000-level	
NOTES: ¹ Entrance into the Honours and Advanced degree programs is summarized in 5.2.1. The courses required in this program will satisfy the University Mathematics requirement. ² Entry into the General degree program is summarized in 5.2.1 and 5.2.2. ³ Ancillary options are chosen in consultation with the department head. ⁴ Among the 2000- and 3000-level courses, at least 6 credit hours must be systematic and at least 6 must be area studies. Systematic courses and area studies courses are listed in Section 5.6. ⁵ Among the 2000- and 3000-level courses, at least 12 credit hours must be systematic and at least 6 must be area studies. Systematic courses and area studies courses are listed in Section 5.6. Students wishing to transfer from the General to the Advanced degree program are permitted to take either GEOG 2200 and GEOG-2250, or GEOG 2530 in either third or fourth year. ⁶ Equivalent ⁵ Equivalent courses offered through Université de Saint-Boniface may be used in lieu of the specified courses identified in the degree program chart. Université de Saint-Boniface courses end in the number "1" (e.g. GEOG 1281). ⁷ May ⁶ May also satisfy the Faculty of Arts requirement.			
Notes: <ul style="list-style-type: none"> • To fulfil prerequisite requirements, a grade of "C" must be achieved, unless otherwise stated, in any course stipulated as a prerequisite to a further course. • Students should review the current course topics available through GEOG 3740 (6), GEOG 3750 (3), GEOG 3760 (6), GEOG 3770 (3) and GEOG 4670 (3). Also, all courses are not offered every year or every term. The course schedule for the current academic term is available from the Class Schedule. • Students registering in certain courses may be required to participate in field trips or field components and pay a portion of the associated expenses. For details, contact the Department of Environment and Geography general office. 			

6.2 Advanced Entry Entrance Requirements

Students complete the first-year of their degree program in University 1 where they select courses from a wide variety of offerings including from the Clayton H. Riddell Faculty of Environment, Earth, and Resources. Students admitted from University 1 are placed in the Major degree program until they have completed a minimum of 48 credit hours after which they may transfer to the Honours program or remain in the Major. To make a program transfer, students must consult a Riddell Faculty student advisor.

6.2.1 Advanced Entry Entrance Requirements			
Degree Program in Physical Geography	Minimum Number of Credit Hours	Minimum Degree Grade Point Average	Additional Entrance Requirements
Honours	48	3.00	A grade of 'B' or better in GEOG 1290 ³ ; a grade of 'C+' or better in 12 credit hours from PHYS 1020 ³ (or PHYS 1050), MATH 1500 ^{2,3} , PHYS 1030 (or PHYS 1070), MATH 1300 ³ (or MATH 1310)
Honours (Coop) ¹	60	3.00	ENVR 2900; students must satisfy the requirements for Entrance/continuation in the regular program and (normally) have completed GEOG 2200, GEOG-2250, GEOG 2300, GEOG 2310, GEOG 2550, PHYS 1020 ³ (or PHYS 1050), and MATH 1500 ^{2,3}
Major	24	2.00	A grade of 'C' or better in GEOG 1290 ³ ; a grade of 'C+' or better in 6 credit hours from PHYS 1020 ³ (or PHYS 1050) and MATH 1500 ^{2,3}
Major (Coop) ¹	60	2.50	ENVR 2900; students must satisfy the requirements for Entrance/continuation in the regular program and (normally) have completed GEOG 2200, GEOG-2250, GEOG 2300, GEOG 2310, GEOG 2550, PHYS 1020 ³ (or PHYS 1050), PHYS 1030 ³ (or PHYS 1070), MATH 1300 ³ (or MATH 1310) and MATH 1500 ^{2,3}
¹ Students may be permitted to enter the program without satisfying all requirements listed. Students should consult with the Cooperative Education Coordinator for further information.			
² MATH 1510 or MATH 1520 or MATH 1690 may be used in lieu of MATH 1500.			
³ Equivalent courses offered through Université de Saint-Boniface may be used in lieu of the specified courses identified in the degree program chart. Université de Saint-Boniface courses end in the number 1.			

6.3 Minimum Performance Requirements for Continuation and Graduation

6.3 Minimum Performance Requirements for Continuation and Graduation

A student's academic performance will be assessed with his/her application for admission to the Clayton H. Riddell Faculty of Environment, Earth, and Resources and following each *term* thereafter. A Riddell Faculty student advisor must approve a student's registration each Fall/Winter and Summer term. Any revisions in this schedule should also be approved prior to the end of the registration revision period.

To be in **good standing** and permitted to continue in a degree program, a student must achieve the minimum standards at each point of assessment. This assessment is based on the student's minimum degree Grade Point Average; the grades received in each of GEOG 1290 (or GEOG 1291), GEOG 2200, GEOG 2250 (or GEOG 2251), GEOG 2300, GEOG 2310, GEOG 2550, GEOG 3810; and the number of failed courses after admission to the Clayton H. Riddell Faculty of Environment, Earth, and Resources.

6.3.1 Minimum Performance Requirements				
Minimum Performance Requirements			Graduation Requirements ¹	
Degree Program (Credit Hours)	Minimum Degree Grade Point Average (DGPA)	Maximum Credit Hours of Failed Courses	Physical Geography Core: Minimum Grade Requirements in GEOG 1290 ² , GEOG 2200 ² , GEOG 2250 ² , GEOG 2300, GEOG 2310, GEOG 2272, GEOG 2550, GEOG 3730 , GEOG 3810	Stream (2000-Level or Higher)
Honours (120)	3.00	18	'B' in GEOG 1290; 'C+' grades in others	Coop Option Courses
				39 credit hours of which at least 24 credit hours must be at the 3000-level or higher;

					completion of GEOG 4660; minimum 'C+' grade in each course.	
Honours Coop (120)	3.00	18		'B' in GEOG 1290; 'C+' grades in others	39 credit hours of which at least 24 credit hours must be at the 3000-level or higher; completion of GEOG 4660; minimum 'C+' grade in each course.	ENVR 2900, ENVR 3900, ENVR 3910, ENVR 3980, ENVR 3920, ENVR 3990; (ENVR 4910 and ENVR 4980 are optional)
Major (120)	2.00	18		'C'	30 credit hours of which at least 18 credit hours must be at the 3000-level or higher; minimum Degree GPA of 2.00.	
Major Coop (120)	2.50	18		'C'	30 credit hours of which at least 18 credit hours must be at the 3000-level or higher; minimum Degree GPA of 2.00.	ENVR 2900, ENVR 3900, ENVR 3910, ENVR 3980, ENVR 3920, ENVR 3990; (ENVR 4910 and ENVR 4980 are optional)
<p>¹B.Sc. Physical Geography students must successfully complete a minimum of 60 credit hours at the University of Manitoba to satisfy the Residence Requirement. The courses used to satisfy the requirement must be acceptable for credit in the Clayton H. Riddell Faculty of Environment, Earth, and Resources.</p> <p>²Equivalent courses offered through Université de Saint-Boniface may be used in lieu of the specified courses identified in the degree program chart. Université de Saint-Boniface courses end in the number 1.</p>						

Program modification:

Modifications to the following are outlined on the next pages:

- **Bachelor of Science (Honours) in Physical Geography**
- **Bachelor of Science (Honours) in Physical Geography, Cooperative Option**
- **Bachelor of Science (Major) in Physical Geography**
- **Bachelor of Science (Major) in Physical Geography, Cooperative Option**

6.5. B.Sc. Physical Geography Program Chart

Bachelor of Science in Physical Geography			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS 120 CREDIT HOURS			
<p>GEOG 1290⁷ PHYS 1020³, MATH 1500⁴, PHYS 1030³, MATH 1300⁴; or 6 credit hours from GEOL 1340⁵, COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ Plus 6 credit hours from the Faculty of Arts</p>	<p>GEOG 2200, GEOG 2250; GEOG 2300, GEOG 2310, GEOG 2530, GEOG 2540, GEOG 2550 Whichever of, PHYS 1030³, MATH 1300⁴, or 6 credit hours from GEOL 1340⁵, COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ not yet taken</p>	<p>GEOG 2272⁸, GEOG 3730, GEOG 3810⁹ 9 credit hours from GEOL 1340⁵, COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ not yet taken</p>	<p>GEOG 4660 Enough elective credit to total 120 credit hours for the program.</p>
It is recommended that students complete the W course within the first 60 credit hours of courses. Plus a Stream approved by a Riddell Faculty student advisor. Honours Stream requirements are as follows: 33 credit hours of 2000- (or higher) level courses, of which 24 credit hours must be at the 3000- or 4000-level.			
HONOURS COOPERATIVE OPTION 120 CREDIT HOURS			
<p>GEOG 1290⁷ PHYS 1020³, MATH 1500⁴, PHYS 1030³, MATH 1300⁴; or 6 credit hours from GEOL 1340⁵, COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ Plus 6 credit hours from the Faculty of Arts</p>	<p>GEOG 2200, GEOG 2250; GEOG 2300, GEOG 2310, GEOG 2530, GEOG 2540, GEOG 2550, ENVR 2900 Whichever of, PHYS 1030³, MATH 1300⁴, or 6 credit hours from GEOL 1340⁵, COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ not yet taken</p>	<p>GEOG 2272⁸, GEOG 3730, GEOG 3810⁹, ENVR 3900, ENVR 3980, ENVR 3910 9 credit hours from GEOL 1340⁵, COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ not yet taken</p>	<p>GEOG 4660 ENVR 3990, ENVR 3920 (ENVR 4980 and ENVR 4910 are optional) Enough elective credit to total 120 credit hours for the program.</p>
It is recommended that students complete the W course within the first 60 credit hours of courses. Plus a Stream approved by a Riddell Faculty student advisor. Honours Stream requirements are as follows: 33 credit hours of 2000- (or higher) level courses, of which 24 credit hours must be at the 3000- or 4000-level.			
MAJOR 120 CREDIT HOURS			
<p>GEOG 1290⁷ PHYS 1020³, MATH 1500⁴, PHYS 1030³, MATH 1300⁴; or 6 credit hours from GEOL 1340⁵, COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ Plus 6 credit hours from the Faculty of Arts</p>	<p>GEOG 2200, GEOG 2250; GEOG 2300, GEOG 2310, GEOG 2530, GEOG 2540, GEOG 2550 Whichever of, PHYS 1030³, MATH 1300⁴, or 6 credit hours from GEOL 1340⁵, COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ not yet taken</p>	<p>GEOG 2272⁸, GEOG 3730, GEOG 3810⁹, GEOG 2300, GEOG 2310, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020⁶, BIOL 1030⁶, MATH 1700⁴ not yet taken</p>	<p>Enough elective credit to total 120 credit hours for the program.</p>
It is recommended that students complete the W course within the first 60 credit hours of courses.			

Plus a Stream approved by a Riddell Faculty student advisor. Honours Stream requirements are as follows: 30 credit hours of 2000- (or higher) level courses, of which 18 credit hours must be at the 3000- or 4000-level.			
MAJOR COOPERATIVE OPTION 120 CREDIT HOURS			
GEOG 1290 ⁷ PHYS 1020 ⁵ , MATH 1500 ⁴ , PHYS 1030 ⁵ , MATH 1300 ⁴ ; or 6 credit hours from GEOG 1340 ⁵ , COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020 ⁶ , BIOL 1030 ⁶ , MATH 1700 ⁴ Plus 6 credit hours from the Faculty of Arts	GEOG 2200, GEOG 2250, GEOG 2300, GEOG 2310, GEOG 2530, GEOG 2540, GEOG 2550, ENVR 2900 Whichever of: PHYS 1030 ⁵ , MATH 1300 ⁴ , or 6 credit hours from GEOG 1340 ⁵ , COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020 ⁶ , BIOL 1030 ⁶ , MATH 1700 ⁴ not yet taken	GEOG 2272 ⁸ , GEOG 3730, GEOG 3810 ³ , ENVR 3900, ENVR 3980, ENVR 3910 9 credit hours from GEOG 1340 ⁵ , COMP 1010, CHEM 1300, CHEM 1310, STAT 1000, STAT 2000, BIOL 1020 ⁶ , BIOL 1030 ⁶ , MATH 1700 ⁴ not yet taken	ENVR 3990, ENVR 3920 (ENVR 4980 and ENVR 4910 are optional) Enough elective credit to total 120 credit hours for the program.
It is recommended that students complete the W course within the first 60 credit hours of courses.			
Plus a Stream approved by a Riddell Faculty student advisor. Honours Stream requirements are as follows: 30 credit hours of 2000- (or higher) level courses, of which 18 credit hours must be at the 3000- or 4000-level.			
MINOR 18 CREDIT HOURS			
GEOG 1290 ⁷ 15 credit hours selected from 2000-, 3000-, or 4000-level courses designated as Physical Geography (PS) or Techniques (TS) courses in the Geography course descriptions defined in sections 5.6 in this Chapter.			
NOTES: ¹ Entrance into the degree programs is summarized in 6.2.1 in this Chapter. ² The courses required in this program will satisfy the University Mathematics requirement. ³ PHYS 1050 and PHYS 1070 may be used in lieu of PHYS 1020 and PHYS 1030, respectively. ⁴ MATH 1510 or MATH 1520 may be used in lieu of MATH 1500; or MATH 1690 may be used in place of MATH 1500 (or equivalent) and MATH 1700; or MATH 1310 may be used in lieu of MATH 1300. ⁵ GEOG 1440 may be used in lieu of GEOG 1340. ⁶ BIOL 1000 and BIOL 1010 may be used in lieu of BIOL 1020 and BIOL 1030. ⁷ Equivalent courses offered through Université de Saint-Boniface may be used in lieu of the specified courses identified in the degree program chart. Université de Saint-Boniface courses end in the number 1 (e.g. GEOG 1281). ⁸ GEOG 2440 may be used in lieu of GEOG 2272. ⁹ GEOG 3680 may be used in lieu of GEOG 3810.			
Note: To fulfil prerequisite requirements a grade of 'C' must be achieved, unless otherwise stated, in any course stipulated as a prerequisite to a further course. • Students should review the course topics available for GEOG 3740 (6), GEOG 3750 (3), GEOG 3760 (6), GEOG 3770 (3) and GEOG 4670 (3). Also, all courses are not offered every year. The course schedule for the current academic term is available from the Class Schedule. • Students registering in certain courses may be required to participate in field trips or field components and pay a portion of the associated expenses. For details, contact the Department of Environment and Geography general office. IMPORTANT: The Honours and Major programs need not be completed in the course order described 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.			

Geological Sciences

Program modifications:

Modifications to the following programs are outlined on the next pages:

- **Bachelor of Science (Honours) in Geological Sciences - Geology**
- **Bachelor of Science (Major) in Geological Sciences – Geology**

- **Bachelor of Science (Honours) in Geological Sciences - Geophysics**
- **Bachelor of Science (Major) in Geological Sciences - Geophysics**

Other Note 1: Geological Sciences - Geology Electives Lists A and B

List A Electives: Honours and Major students must complete a minimum of 9 credit hours from the following courses:	
GEOL 2390	Environmental Geology (3)
GEOL 4280	Instrumental Techniques In Geology (3)L
GEOL 4300	Mineral Deposits (3)L
GEOL 4520	Petroleum Geology (3)L
GEOL 4890	Basin Analysis (3)L

List B Electives: Honours students are required to complete a minimum of 9 credit hours; Major students must complete a minimum of 6 credit hours from the following courses:	
GEOL 3140	Gemology (3)L
GEOL 3420	Engineering Geology (3)
GEOL 3450	Hydrogeology (3) L
GEOL 3740	Exploration Seismology (3)L
GEOL 3750	Geology and Geophysics of the Planets (3)L
GEOL 3810	Applied Geophysics (3)L
GEOL 4260	Applied Geophysics Field Course (3)
GEOL 4270	Advanced Studies in Earth Sciences (3)
GEOL 4310	Paleontologic Principles (3)L
GEOL 4360	Mineral Exploration Techniques (3) L
GEOL 4370	Global Change (3)
GEOL 4380	Mineral Resource Development (3)
GEOL 4740	Geophysics Field School (6)
GEOL 2250	Introduction to Geographic Information Systems (3)L
GEOG 3730	
and/or up to 6 credit hours of additional courses not yet completed from List A.	
NOTE: With departmental approval, up to 6 credit hours of 2000-level or higher courses from other departments may be substituted for courses in List B in order to satisfy professional registration (APEGM) requirements.	

Other Note 1: Geological Sciences - Geophysics Electives Lists A, B and P

List A Electives: Honours students are required to complete a minimum of 9 credit hours; Major students must complete a minimum of 6 credit hours from the following courses:	
GEOL 4250	Theory and Application of Geophysical Inversion Methods (3)L
GEOL 4320	Physics of the Earth: Seismology and Heat Flow (3)
GEOL 4330	Physics of the Earth: Geomagnetism and Gravity (3)
List B Electives: Honours students are required to complete a minimum of 6 credit hours; Major students must complete a minimum of 6 credit hours from the following courses:	
GEOL 2390	Environmental Geology (3)
GEOL 2770	Principles of Inorganic Geochemistry (3)L
GEOL 3110	Petrogenesis of Igneous Rocks (3)L
GEOL 3420	Engineering Geology (3)
GEOL 3440	Structure and Metamorphism (3)L
GEOL 3450	Hydrogeology (3)L
GEOL 3490	Glacial Geology and Geomorphology (3)L
GEOL 3750	Geology and Geophysics of the Planets (3)L
GEOL 3900	Sedimentology (3)L
GEOL 3910	Introduction to Field Mapping (3)
GEOL 4270	Advanced Studies in Earth Sciences (3)
GEOL 4300	Mineral Deposits (3)L
GEOL 4360	Mineral Exploration Techniques (3)L
GEOL 4370	Global Change (3)
GEOL 4380	Mineral Resource Development (3)
GEOL 4520	Petroleum Geology (3)L
GEOL 4890	Basin Analysis (3)L
GEOL 4910	Advanced Field Mapping (3)
GEOG 2250 GEOG 3730	Introduction to Geographic Information Systems (3)L
Any List A or P not already taken, or any advanced level Geological Sciences, Physics or Mathematics course(s) approved by department.	
List P Electives: Honours students are required to complete a minimum of 6 credit hours; Major students must complete a minimum of 3 credit hours from the following courses:	
CHEM 2290	Chemical Energetics and Dynamics: Macroscopic Descriptions (3)L
MECH 2260	Introduction to Fluid Mechanics (3)L
PHYS 2610	Circuit Theory and Introductory Electronics (3)L
PHYS 2650	Classical Mechanics 1 (3)
PHYS 3630	Electro - and Magnetostatic Theory (3)
PHYS 3670	Classical Thermodynamics (3)
Or alternate physical science course(s) approved by department.	

Extended Education Division

Program modifications:

Modifications to the **Aboriginal Environmental Stewardship Diploma** are outlined below. A revised program chart is provided on the next page.

- ARTS 1110 – Introduction to University (3) and ENVR 3160 Environmental Responsibilities and the Law (3) will be added to the required core courses. ENVR 2650 – Environmental and Natural Resource Policy (3) will be removed from the core courses. The total number of credit hours of core courses will increase from 27 to 30 credit hours.
- The following courses will be added to the list of elective courses:
 - EER 1000 – Earth: A User's Guide (3)
 - GEOL 1340 – The Dynamic Earth (3)
 - GEOG 1290 – Introduction to Physical Geography (3)
 - BIOL 1000 – Biology: Foundations of Life (3)
 - BIOL 1010 – Biology: Biological Diversity and Interaction (3)
 - BIO 2390 – Introduction to Ecology (3)
- The credit hour weighting for ENVR 3000 – Multidisciplinary Topics in Environment Science, which is included among the elective courses, will be corrected from (1.5) to (3).
- The total number of credit hours of elective courses will decrease from 33 to 28.5 credit hours.
- The requirement for work experience will be amended to require ENVR 2900 – Professional Development in the Environmental Sectors I (1.5). Students will no longer be required to complete Building Environmental Aboriginal Human Resources (BEAHR) 4 month "Aboriginal Work Experience Program (AWEP).
- The total number of credit hours for the program will remain unchanged, at 60 credit hours.

AESD Minor Revision 2015 Proposed Course Changes:

Core Courses (credit hours)	Total Credit Hours
ARTS1110 <i>Introduction to University</i> (3) NATV 1220 <i>The Native Peoples of Canada, Part 1</i> (3) ENVR 1000 <i>Environmental Science 1 – Concepts</i> (3) NATV 1240 <i>The Native Peoples of Canada, Part 2</i> (3) ENVR 2000 <i>Environmental Science 2 – Issues</i> (3) ENVR 3160 - <i>Environmental Responsibilities and Law</i> (3) NATV 2100 <i>Aboriginal Spirituality</i> (3) ENVR 3250 <i>Environmental Assessment</i> (3) NATV 3310 <i>Canadian Law and Aboriginal People</i> (3) GEOG 4260 <i>Sacred Lands and Sacred Spaces of Indigenous Peoples</i> (3)	30
Elective Courses (credit hours)*	
ENVR 2010 <i>Field Studies in Environment 1</i> • <i>GPS Field Survey and Sampling</i> (1.5) • <i>Field Readiness and Outdoor Survival</i> (1.5) • <i>Wildlife Sampling, Stewardship and GIS</i> (1.5) ENVR 2020 <i>Extended Field Topics in Environmental Science 1</i> • <i>Basic Communication and Statistical Skills</i> (3) • <i>Biological and Ecological Concepts</i> (3) • <i>Landscape Sampling and Boreal Forest Stewardship</i> (3) • <i>Environmental Health</i> (3) ENVR 3000 <i>Multidisciplinary Topics in Environment Science 1</i> • <i>Ecosystem Management Techniques</i> (3) • <i>Biogeography</i> (3) • <i>Concepts in Wildlife Management</i> (3) • <i>Ecology of the Boreal Region</i> (3) • <i>Parks and Protected Areas</i> (3) • <i>Indigenous Stewardship</i> (3) ENVR 3010 <i>Field Topics in Environmental Science 1</i> • <i>Water Quality Assessment</i> (1.5) • <i>Issues in Sustainable Forestry</i> (1.5) • <i>Soil Characterization</i> (1.5) • <i>Wildlife and/or Fisheries Techniques</i> (1.5) EER1000 <i>Earth: A User's Guide</i> (3) GEOL1340 <i>The Dynamic Earth</i> (3) GEOG1290 <i>Introduction to Physical Geography</i> (3) BIOL1000 <i>Biology: Foundations of Life</i> (3) BIOL1010 <i>Biology: Biological Diversity and Interaction</i> (3) BIOL 2390: <i>Introductory Ecology</i> (3)	28.5
Work Experience Program ENVR 2900 <i>Professional Development in the Environmental Sectors I</i> (1.5)	1.5
TOTAL DEGREE CREDIT HOURS	60

- ACADEMIC COMMITTEE WILL SELECT THE ELECTIVE COURSES FOR EACH COHORT OFFER OF THE PROGRAM
- 28.5 hrs of elective courses will be selected by the committee out of a total of 58.5 hrs

Faculty of Management (I.H. Asper School of Business)

Accounting and Finance

Introductions:

FIN 4240 Financial Modelling Cr.Hrs. 3 +3.0
Spreadsheet implementation of practitioner-oriented financial models. May not be held with FIN 4230 when titled "Financial Modeling". Prerequisite: FIN 3410 (C).

FIN 4250 Behavioral Finance Cr.Hrs. 3 +3.0
Understand how human biases impact the financial decisions of market participants and the practical implications. Prerequisite: FIN 2200 (C+).

NET CHANGE IN CREDIT HOURS: +6.0

Program modification:

Modifications to the **Bachelor of Commerce (Honours), Finance Major** are outlined on the next pages.

I.H. ASPER SCHOOL OF BUSINESS
Department of Accounting and Finance

Proposal to Change Requirements for Major in Finance

It has become necessary to restructure the finance major to incorporate two new courses; FIN 4240 – Financial Modeling and FIN 4250 – Behavioral Finance. In addition, FIN 3460 has been made a finance elective. The students are expected to benefit from the flexibility they have to choose their finance courses.

Current description of Finance Major:

The Major consists of: FIN 3410*, FIN 3460*, FIN 3480*, and FIN 4400.

Finance Options are: FIN 3450, FIN 4230, FIN 4260, and FIN 4270. Students in the Finance Major may take all of these courses.

The prerequisite for FIN 3410, FIN 3460 and FIN 3480 is FIN 2200 (C+), MATH 1300 (C) or MATH 1310 (C), and STAT 2000 (C).

*Finance students are also required to take MATH 1300 (C) or MATH 1310 (C) and STAT 2000 (C) as part of the electives in their program since it they are part of the prerequisite for the finance courses as stated above.

Capstone Course: FIN 4400.

Proposed Description of Finance Major:

The major consists of 12 credit hours from: FIN 3410*, FIN 3480*, and FIN 4400 *plus* one of FIN 3400, FIN 3420, FIN 3450, FIN 3460*, FIN 4240, FIN 4250, FIN 4260, or FIN 4270.

*The prerequisites for FIN 3410, FIN 3460 and FIN 3480 are: FIN 2200 (C+), MATH 1300 (C) or MATH 1310 (C), and STAT 2000 (C).

Finance students are also required to take MATH 1300 (C) or MATH 1310 (C) and STAT 2000 (C) as part of the electives in their program since they are part of the prerequisite for the finance courses as stated above.

Capstone Course: FIN 4400.

Summary:

Remove FIN 3460 (3 cr. hrs) from required courses for Finance Major and replace it with one of FIN 3450, FIN 3460, FIN 4230, FIN 4240, FIN 4250, FIN 4260, and FIN 4270.

Rationale:

Rapid advances in the financial markets and instruments have created a need for our students to be equipped with new skills. The new FIN 4240 (Financial modeling) would enable the students majoring in finance to learn the critical skills of computer based financial modeling in preparation for their careers. Behavioral finance also is a rapidly developing area in finance. FIN 4250 (Behavioral Finance) would introduce our students to new ways of incorporating the human behavioral aspects into investing. The two courses, FIN 4240 and 4250, together bring about a timely improvement to our finance course offerings at our School. The new courses will be offered starting in Fall 2015. The proposed changes to the Finance Major give added flexibility to students in their choice of courses and the ability to maximize the benefits from the two newly introduced courses.

Actuarial Mathematics

Modifications:

ACT 2120 Interest Theory Cr.Hrs. 3 0.0

The application of calculus and probability to discrete and continuous interest functions. Key topics are the measurement of interest, present and accumulated values, and annuities. May not be held with the former 010.212 or 010.232 or ACT 3320 (or 010.332). Prerequisite: MATH 1232 (C) or MATH 1690(C) or MATH 1700 (B) or MATH 1701 (B) or MATH 1710 (B).

Prerequisite or corequisite: [MATH 2720 or MATH 2721 (D)] or [MATH 2731 or the former MATH 2750 or MATH 2730 (D)] and STAT 2400 (D).

ACT 2210 Introduction to Risk Management Cr.Hrs. 3 0.0

Mathematical tools for the quantitative assessment of risk and their application to problems encountered in risk management. Prerequisite or corequisite: [MATH 2720 or MATH 2721 (D)] or [MATH 2731 or the former MATH 2750 or MATH 2730 (D)] and STAT 2400 (D) or consent of instructor.

NET CHANGE IN CREDIT HOURS: 0.0

Program modification:

Modifications to the **Bachelor of Commerce (Honours), Actuarial Mathematics Major** are outlined on the next pages.

**ACTUARIAL MATHEMATICS
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Current Actuarial Mathematics Major:

The Major consists of any 12 hours from ACT 2020, ACT 2120, ACT 3340, ACT 3530, ACT 3630, ACT 4630.

Students prior to September 2014 can also hold ACT 3130, ACT 3230, ACT 4140 and ACT 4340 in the major.

Prior to registration, all students interested in or enrolled in Actuarial Mathematics should consult the Director or an Undergraduate Program Advisor for program planning advice.

To facilitate entry into and understanding of material covered in some advanced Actuarial courses, students entering the second year of the four-year program are advised to take the following courses: MATH 2720 plus MATH 2730 or MATH 2750 (which satisfies the elective requirement). Students declaring Actuarial Mathematics as their first major may take these course as either Business Options or non-Business Electives.

Students admitted in Fall 2006 and thereafter are required to attain a minimum grade of "C+" in all Actuarial courses in order to graduate with an Actuarial Mathematics Major.

Students interested in the Actuarial Mathematics major are encouraged to take MATH 1300 and MATH 1700 as Track 1/Foundation courses or alternately as electives in Year 1.

Proposed Actuarial Mathematics Major:

The Major consists of any 12 hours from ACT 2020, ACT 2120, ACT 3130, ACT 3230, ACT 3340, ACT 3630, ACT 4630.

Students admitted to the Asper School of Business prior to September 2011 may also use the following courses toward the 12 credit hours of the Actuarial Mathematics major, but only if the courses were taken prior to September 2011: ACT 2210, ACT 3330, ACT 3530, ACT 4240.

Students admitted to the Asper School of Business prior to September 2014 may use the following courses toward the 12 credit hours of the Actuarial Mathematics major: *Any 12 credit hours from:* ACT 2020, ACT 2120, ACT 3130, ACT 3230 [ACT 3630 (6 hrs) may be taken in place of ACT 3130 (3 hrs) *plus* ACT 3230 (3 hrs)], ACT 3340, ACT 4140, ACT 4340 [ACT 4630 (6 hrs) may be taken in place of ACT 4140 (3 hrs) *plus* ACT 4340 (3 hrs)].

Prior to registration, all students interested in or enrolled in Actuarial Mathematics should consult the Director or an Undergraduate Program Advisor for program planning advice.

Students admitted in the Fall 2006 term and thereafter are required to attain a minimum grade of "C+" in all 12 credit hours of Actuarial courses that will contribute to the Major in order to graduate with an Actuarial Mathematics Major.

Students are also advised that the following 15 credit hours of courses are required (and *another* 3 credit hours are recommended) to obtain the Actuarial Mathematics Major:

MATH 1300 [or MATH 1220] (C) and MATH 1700(B) [or MATH 1232 (C)]. These courses can be used to satisfy Track 1/Foundation courses or alternately as electives in Year 1. . Note: Both MATH 1300 and MATH 1700 are prerequisite to MATH 2720 which is required for ACT 2120.

MATH 2720 [D]. Students declaring Actuarial Mathematics as their first major may take this course as either a Business Option or non-Business Elective.

STAT 2400 and STAT 3400. STAT 2400 is needed for ACT 2120. STAT 3400 is needed for ACT3130, ACT 3630 and ACT 4630. These courses can contribute to the 2000+ Level elective requirement of the degree.

Plus STAT 2000 is a recommended elective. This course can contribute to the 2000+ Level elective requirement of the degree.

Prior to registration, all students interested in or enrolled in Actuarial Mathematics should consult the Director for program planning advice.

Faculty of Management

Program modification:

Modifications to the Alternative Management Studies requirement for the **Bachelor of Commerce (Honours)** program are set out on the next pages.

**DESCRIPTION OF PROGRAM AND GRADUATION REQUIREMENTS
MODIFICATION TO THE CALENDAR ENTRIES
EFFECTIVE 2015 FALL TERM**

Current Calendar Description:

Note 9 as it appear in section 4.1

Note 4 as it appears in section 4.4

Note 5 as it appears in section 4.5

Note 5 as it appears in section 4.6

Note 5 as it appears in section 4.7

Alternative Management Requirement: One of the following must be chosen: ECON 2540, ECON 2630, ECON 3710, ECON 3810, ENVR 4110, GPE 2700, POLS 3220, POLS 3250, or GMGT 4210. If a 6 credit hour course is chosen, 3 credit hours will count as Electives. Take careful note of any course prerequisites in your timetable planning. May be taken in Year 3 or Year 4.

Proposed Calendar Description:

Note 9 as it appear in section 4.1

Note 4 as it appears in section 4.4

Note 5 as it appears in section 4.5

Note 5 as it appears in section 4.6

Note 5 as it appears in section 4.7

Alternative Management Requirement: One of the following must be chosen: AGRI 3030 (Cooperatives in Business and Community topic only), ECON 2540, LABR 2300, NATV 3120, NATV 4220, NATV 4320, POLS 3250, POLS 3270, SOC 3838 or any one of the following Asper courses: GMGT 4210, LEAD 3030 or MKT 3240 (Sustainability Marketing topic only). Take careful note of any course prerequisites in your timetable planning. Course prerequisites will be waived for Asper students in the following courses: NATV 3120, NATV 4220 NATV 4320, and POLS 3270; students must contact an Asper Program Advisor before registration for the prerequisite waiver. May be taken in Year 3 or Year 4.

College of Nursing

Program modification:

A modification to the **Bachelor of Nursing** program is set out on the next pages.

Bachelor of Nursing Program
College of Nursing, Faculty of Health Sciences
Program Modification

Background

The Bachelor of Nursing Program currently requires HNSC 1210 Nutrition for Health and Changing Lifestyles (3 cr. hrs). Human Nutritional Sciences has worked with the Faculty of Health Sciences Colleges of Nursing, Pharmacy and Dentistry to develop HNSC 2170 Nutrition for Health Professionals (2 cr. hrs).

HNSC 2170 will better meet the learning needs of undergraduate nursing students and will provide foundational nutrition knowledge upon which other nursing courses will build. The reduction of one credit hour will not negatively affect the student experience. The Bachelor of Nursing program is currently undergoing revision and the final number of credit hours for the revised Bachelor of Nursing program has yet to be finalized.

HNSC 2170 will be placed in Year Two of the Bachelor of Nursing Program.

Current Year Two Program

Number	Cr.Hrs	Course Name
NURS 2500	6	Health and Illness 1: Pathophysiology/Pharmacology/Assessment
NURS 2512	2	Health and Illness 2: The Older Client
NURS 2510	2	Client and Context 1: Human Growth and Development
NURS 2520	2	Professional Foundations 1: Development of Professional Identity
NURS 2530	1	Nursing Skills 1
NURS 2540	2	Nursing Practice 1
NURS 2514	6	Health and Illness 3: Pathophysiology/Pharmacology/Assessment
NURS 2516	2	Client and Context 2: Human Diversity
NURS 2532	1	Nursing Skills 2
NURS 2542	3	Nursing Practice 2
HNSC 1210	3	Nutrition for Health & Changing Lifestyles

Program Modification
 Re HSNC 2170
 Bachelor of Nursing Program

Proposed Year Two Program with Modification

Number	Cr.Hrs	Course Name
NURS 2500	6	Health and Illness 1: Pathophysiology/Pharmacology/Assessment
NURS 2512	2	Health and Illness 2: The Older Client
NURS 2510	2	Client and Context 1: Human Growth and Development
NURS 2520	2	Professional Foundations 1: Development of Professional Identity
NURS 2530	1	Nursing Skills 1
NURS 2540	2	Nursing Practice 1
NURS 2514	6	Health and Illness 3: Pathophysiology/Pharmacology/Assessment
NURS 2516	2	Client and Context 2: Human Diversity
NURS 2532	1	Nursing Skills 2
NURS 2542	3	Nursing Practice 2
HSNC 2170	2	Nutrition for Health Professionals

College of Pharmacy

Deletions:

PHRM 2420 Applied Nutrition for Health Care Professionals Cr.Hrs. 3	-3.0
PHRM 2310 Clinical Pharmacy 1 Cr.Hrs. 4	-4.0

Introduction:

PHRM 2320 Clinical Pharmacy 1 Cr.Hrs. 5	+5.0
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This course introduces principles of drug therapy to manage self-care conditions and ambulatory ailments. There is also a component of health promotion with a focus on clinically relevant nutrition topics for pharmacists. Non-prescription and prescription treatment approaches will be covered within the course. May not be held with the former PHRM 2310.

NET CHANGE IN CREDIT HOURS: -2.0

Program modification:

Modifications to the **Bachelor of Science in Pharmacy** program are set out on the next page.

Current program requirements:

YEAR 2		Fall		Winter	
Course #	Course Name	Term	Credits	Course #	Course Name
MBIO 3010	Mech. of Micro Diseases	Fall	3.00	PHAC 2100	Pharmacology
PHAC 2100	Pharmacology	Fall/Winter	3.00	PHRM 2100	Pharmacy Skills Lab 2
PHRM 2100	Pharmacy Skills Lab 2	Fall/Winter	1.50	PHRM 2222	Medicinal Chemistry
PHRM 2222	Medicinal Chemistry	Fall/Winter	3.00	PHRM 2270	Pharmaceutics
PHRM 2270	Pharmaceutics	Fall/Winter	3.00	PHRM 2280	Pharmacokinetics
PHRM 2310	Clinical Pharmacy 1	Fall/Winter	2.00	PHRM 2310	Clinical Pharmacy 1
PHRM 2420	Applied Nutrition	Fall	3.00		
			18.50		
				PHRM 2700	SPEP 2
					Spring
					2.00
					TOTAL
					36.00

Proposed for 2015-16
Additions/deletions

YEAR 2		Fall		Winter	
Course #	Course Name	Term	Credits	Course #	Course Name
HNSC 2170	Nutrition for Health Prof.	Fall	2.00	PHAC 2100	Pharmacology
MBIO 3010	Microbial Disease	Fall	3.00	PHRM 2100	Pharmacy Skills Lab 2
PHAC 2100	Pharmacology	Fall/Winter	3.00	PHRM 2222	Medicinal Chemistry
PHRM 2100	Pharmacy Skills Lab 2	Fall/Winter	1.50	PHRM 2270	Pharmaceutics
PHRM 2222	Medicinal Chemistry	Fall/Winter	3.00	PHRM 2280	Pharmacokinetics
PHRM 2270	Pharmaceutics	Fall/Winter	3.00	PHRM 2310	Clinical Pharmacy 1
PHRM 2310	Clinical Pharmacy 1	Fall/Winter	2.00	PHRM 2320	Clinical Pharmacy 1
PHRM 2320	Clinical Pharmacy 1	Fall/Winter	2.00		
PHRM 2420	Applied Nutrition	Fall	3.00		
			17.50	PHRM 2700	SPEP 2
					Spring
					2.00
					TOTAL
					36.00

Faculty of Science

Faculty of Science

Program modification:

Modifications to the general Academic Regulations for the **Bachelor of Science (General)** programs are outlined on the next pages.

**FACULTY OF SCIENCE – B.Sc. GENERAL DEGREE
PROGRAM MODIFICATION
EFFECTIVE 2015 FALL TERM**

Current B.Sc. General Academic Regulations:

A student must complete 90 credit hours with passing grades ("D" or better) in each course. A student must obtain a minimum grade point average of 2.00 on the 90 credit hours which constitute the degree to qualify for the degree of Bachelor of Science (General).

~~There is no limit on the number of courses that can be taken within the B.Sc. (General).~~ Students may not exceed 36 credit hours of failures.

Introductory Level Science courses (24 credit hours): Students must select 6 credit hours from each of 3 areas listed below (18 credit hours) in Group A. Additionally, students must select 6 credit hours from any courses listed in Group A and/or Group B.

NOTE: No more than 6 credit hours may be selected from any single subject area for use toward the 24 credit hours of introductory course requirements.

Group A:

Astronomy: six credit hours chosen from PHYS 1810, PHYS 1820, PHYS 1830

Biology: BIOL 1020 and BIOL 1030

Chemistry: CHEM 1300 and CHEM 1310

Computer Science: COMP 1010 (or COMP 1012²) and COMP 1020

Mathematics: six credit hours chosen from MATH 1200 (or MATH 1210¹), MATH 1300 (or equivalent), MATH 1500, (or equivalent), MATH 1700 (or equivalent).

Microbiology: MBIO 1010 and MBIO 2020

Physics: PHYS 1020 or PHYS 1050; and PHYS 1030 or PHYS 1070

Statistics: STAT 1000 (or STAT 2220³) and STAT 2000

Group B:

BIOL 1410, FORS 2000.

Notes:

1. MATH 1210 is intended for Engineering students and may not be held for credit with MATH 1200 or MATH 1300.

2. COMP 1012 is intended for Engineering students and may not be held for credit with COMP 1010.

3. STAT 2220 is intended for Engineering students and may not be held for credit with STAT 1000

Proposed B.Sc. General Academic Regulations:

A student must complete 90 credit hours with a **grade of "D"** or better in each course. A student must obtain a minimum grade point average of 2.00 on the 90 credit hours which constitute the degree to qualify for the degree of Bachelor of Science (General).

Students may not exceed 36 credit hours of failures.

Introductory Level Science courses (24 credit hours): Students must select 6 credit hours from each of 3 areas listed below (18 credit hours) in Group A. Additionally, students must select 6 credit hours from any courses listed in Group A and/or Group B.

NOTE: No more than 6 credit hours may be selected from any single subject area for use toward the 24 credit hours of introductory course requirements.

Group A:

Astronomy: six credit hours chosen from PHYS 1810, PHYS 1820, PHYS 1830

Biology: BIOL 1020 and BIOL 1030

Chemistry: CHEM 1300 and CHEM 1310

Computer Science: COMP 1010 (or COMP 1012²) and COMP 1020

Mathematics: six credit hours chosen from:

- MATH 1200 (or MATH 1210¹),
- **MATH 1240**
- **3 credit hours from MATH 1220 or MATH 1300 (or equivalent)**
- **3 credit hours from MATH 1230 or MATH 1500, (or equivalent)**
- **3 credit hours from MATH 1232 or MATH 1700 (or equivalent)**

Microbiology: MBIO 1010 and MBIO 2020

Physics: PHYS 1020 or PHYS 1050; and PHYS 1030 or PHYS 1070

Statistics: STAT 1000 (or STAT 2220³) and STAT 2000

Group B:

BIOL 1410, FORS 2000.

Notes:

1. MATH 1210 is intended for Engineering students and may not be held for credit with MATH 1200, **or** MATH 1220, or MATH 1300.
2. COMP 1012 is intended for Engineering students and may not be held for credit with COMP 1010.
3. STAT 2220 is intended for Engineering students and may not to be held for credit with STAT 1000.

Summary of Changes:

1. Remove the statement that there is no limit on the number of courses that can be taken in the B.Sc. (General).
2. Add new course options to the list of Mathematics courses for the Introductory Level Science component of the B.Sc. General Degree.
3. In Footnotes add the information that MATH 1210 may not be held for credit with MATH 1220.
4. Remove the words passing grades in the first paragraph of the General Academic Regulations section.

Rationale for Changes:

1. This statement was removed at the recommendation of the 4Cs committee, as the statement is counter to other initiatives at the University to reduce time-to-completion and to use resources efficiently.
2. The Mathematics department has recently added courses at the 1000-level to their list of course offerings. These courses are suitable alternatives for students to complete as part of their B.Sc. General Degree.
3. MATH 1220 is one of the newly proposed Math courses that may not be held with MATH 1210.
4. This was removed at the recommendation of the 4Cs committee, as a grade of D isn't considered a passing grade in all faculties.

Actuarial Mathematics

Program modification:

Modifications to the **Bachelor of Science (Honours) in Actuarial Mathematics** are outlined on the next pages.

**ACTUARIAL MATHEMATICS
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Proposed Changes to the B.Sc. Honours Degree in Actuarial Mathematics

Current B.Sc. Honours in Actuarial Mathematics Program:

To enter the program, a student must have completed a minimum of 24 credit hours with a minimum GPA of 3.00, and also obtained a minimum grade of "B" in one of the following courses: ~~a three (3) credit hour Written English (W) course, MATH 1300, MATH 1500, MATH 1700, STAT 1000, or both of ECON 1010 and ECON 1020.~~ All of these courses are program requirements and students are strongly urged to take them in the first year.

To continue in the Actuarial Mathematics Honours program, students must maintain a minimum DGPA of 3.00, and complete a minimum of 9 credit hours during each Fall and Winter Term.

To graduate with the B. Sc. Honours degree, a student must achieve a minimum DGPA of 3.00, a minimum grade of "C+" in each of the Honours Program Specific courses (see below) and a minimum grade of "C" on all remaining courses that contribute to the 120 credit hours of the degree.

Honours Program Specific Courses

Students must achieve a minimum grade of "C+" in each of the following for both prerequisite purposes and graduation requirements:

ACT 2020, ACT 2120, ACT 2210, ACT 3130, ACT 3340, ACT 3630, ACT 4060, ~~ACT 4140, ACT 4340,~~ ACT 4630,

~~In order to receive course credit for, and examination exemptions from, future Society of Actuaries (SoA) and VEE courses, students must obtain a minimum grade of "B" in the following courses: ECON 1010, ECON 1020, ACC 4400, FIN 2200, STAT 3470, and STAT 3490. Contact the Warren Centre for Actuarial Studies and Research for further information.~~

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS ACTUARIAL 120 CREDIT HOURS			
ECON 1010 ⁵ , ECON 1020 ⁵	ACT 2020, ACT 2120	ACT 3630, ACT 3340,	ACT 4630, ACT 4060,
MATH 1500 ⁴ , MATH 1700 (B) ⁴ , MATH 1300 ⁴	STAT 2400, STAT 3400	MGMT 2010	STAT 3470 ⁵ , STAT 3490 ^{3,5}
STAT 1000, STAT 2000	ACC 1100 ^{2,6} , FIN 2200 ^{2,5} , ACT 2210	STAT 3050, STAT 3800	MSCI 2150
3 credit hour "W" requirement	MATH 2720 ⁴ , MATH 2730 ⁴		
	MATH 2300 ⁴		
6 credit hours of electives ²		12-credit hours of approved electives ⁶	12-credit hours of approved electives ⁶
30 Hours	30 Hours	30 Hours	30 Hours

JOINT STATISTICS - ACTUARIAL MATHEMATICS HONOURS: See Section 4.13.3

NOTES:

¹ ~~MATH 1510 or MATH 1520 may be taken instead of MATH 1500; MATH 1310 may be taken instead of MATH 1300; MATH 1710 may be taken instead of MATH 1700; MATH 1690 may be taken in place of both MATH 1500 and MATH 1700; MATH 2750 may be taken in place of both MATH 2720 and MATH 2730.~~

² Students are strongly urged to complete ACC 1100 in Year 1 when possible. FIN 2200 may be taken in Year 2, 3 or 4; however, it is strongly recommended that it be completed in Year 2. Note that ACC 1100 is a prerequisite for FIN 2200.

³ STAT 3490 may be taken in Year 3 or 4.

⁴ ~~MATH 2300 may be taken in Year 2, 3 or 4.~~

⁵ ~~In order to receive course credit and examination exemptions from future Society of Actuaries (SoA) and VEE courses, students must obtain a minimum grade of "B" in these courses.~~ Contact the Warren Centre for Actuarial Studies and Research for further information.

⁶ Recommended Electives

The electives in Year 3 and Year 4 are to be chosen from Actuarial Mathematics, approved Business courses, Computer Science, Economics, Mathematics (3000 or 4000 level) and Statistics (4000 level courses). Other electives may be selected through consultation with the program director.

Year 3: FIN 3410, STAT 3480

Year 4: ~~FIN 3270~~, STAT 4100, STAT 4200, STAT 4520, STAT 4530, STAT 4630.

Proposed B.Sc. Honours in Actuarial Mathematics Program:

To enter the program, a student must have completed a minimum of 24 credit hours with a minimum GPA of 3.00, and also obtained a minimum grade of "B" in one of the courses listed in Year 1 of the program chart. All of the courses listed in Year 1 of the program chart are program requirements and students are strongly urged to take them in the first year.

To continue in the Actuarial Mathematics Honours program, students must maintain a minimum DGPA of 3.00, and complete a minimum of 9 credit hours during each Fall and Winter Term.

To graduate with the B. Sc. Honours degree, a student must achieve a minimum DGPA of 3.00, a minimum grade of "C+" in each of the Honours Program Specific courses (see below), and a minimum grade of "C" on all remaining courses that contribute to the 120 credit hours of the degree.

Honours Program Specific Courses

Students must achieve a minimum grade of "C+" in each of the following for both prerequisite purposes and graduation requirements:

ACT 2020, ACT 2120, ACT 2210, ACT 3130, **ACT 3230**, ACT 3340, ACT 3630, ACT 4060, **ACT 4160**, ACT 4630

The following courses with a "B" or better may be used for Society of Actuaries (SoA) VEE credits: ECON 1010, ECON 1020, FIN 2200, STAT 3470, and STAT 3490. Contact the Warren Centre for Actuarial Studies and Research for further information.

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS ACTUARIAL 120 CREDIT HOURS			
ECON 1010 ⁴ , ECON 1020 ⁴ MATH 1220¹, MATH 1230¹, MATH 1232¹, MATH 1240 STAT 1000, STAT 2000	ACT 2020, ACT 2120 ⁶ , ACT 2210 STAT 2400, STAT 3400 ACC 1100 ² , FIN 2200 ^{2,4} MATH 2720 GMGT 2010⁵	ACT 3630 (or both ACT 3130 & ACT 3230), ACT 3340, ACT 4630 ³ STAT 3050, STAT 3800	ACT 4060, ACT 4160 STAT 3470 ^{3,4} STAT 3490 ^{3,4} MSCI 2150
6 credit hours of electives ²	3 credit hours of electives ²	9 credit hours of approved electives ⁶	15 credit hours of approved electives ⁶
30 Hours	30 Hours	30 Hours	30 Hours
JOINT STATISTICS - ACTUARIAL MATHEMATICS HONOURS: See Section 4.13.3			
NOTES:			
¹ The following substitutions are allowed: MATH 1300 (C) or MATH 1310 in place of MATH 1220 (C), MATH 1500 (B) or MATH 1510 (B) in place of MATH 1230 (C), MATH 1700 (B) or MATH 1710 (B) in place of MATH 1232 (C).			
² Students are strongly urged to complete ACC 1100 in Year 1 when possible. FIN 2200 may be taken in Year 2, 3 or 4; however,			

it is strongly recommended that it be completed in Year 2. Note that ACC 1100 is a prerequisite for FIN 2200.

³ **STAT 3470, STAT 3490 and ACT 4630** may be taken in Year 3 or 4.

⁴ **These courses may be used for SOA VEE credits if a grade of B or better is achieved.** Contact the Warren Centre for Actuarial Studies and Research for further information.

⁵ **GMGT 2010** fulfills the written English requirement.

⁶ Recommended Electives

The electives in Year 3 and Year 4 are to be chosen from Actuarial Mathematics, approved Business courses, Computer Science, Economics, Mathematics (3000 or 4000 level) and Statistics (4000 level courses). Other electives may be selected through consultation with the program director.

Year 3: FIN 3270, FIN 3410, STAT 3480

Year 4: ACT 4000, STAT 4100, STAT 4200, STAT 4520, STAT 4530, STAT 4630.

Summary of Changes:

1. Modify the text in the entry requirements section.
2. Delete the "W" requirement in Year 1 of the program. Move GMGT 2010 to Year 2 of the program.
3. In the chart replace MATH 1300 with MATH 1220, MATH 1500 with MATH 1230, MATH 1700 with MATH 1232.
 - Add MATH 1240 to the Year 1 requirement.
 - Add a footnote about acceptable Math substitutions.
 - Remove MATH 2730 and MATH 2300.
4. Add that ACT 3130 & 3230 may be used in place of ACT 3630.
5. Move ACT 4630 to Year 3 requirement with a footnote indicating it may be taken in Year 3 or Year 4. Along with a footnote indicating STAT 3470 may be taken in Year 3 or 4.
7. Add ACT 4160 to the Year 4 requirement.
8. ACC 1100 is deleted from the VEE credit list.

Rationale:

1. Rewording of the entry requirements section to point students to the program chart for information.
2. Students in the B.Sc. Actuarial Mathematics Honours program fulfill the written English requirement by taking the required GMGT 2010. To comply with the university regulations that the written English requirement be completed within the first 60 hours GMGT 2010 was moved to Year 2.
2. The changes in Mathematics courses are based on the proposed changes to the Mathematics curriculum.
3. ACT 3130 & 3230 are suitable substitutions for ACT 3630.
4. Although ACT 4630 can be taken in either Year 3 or Year 4, we recommend students to take it in Year 3 so that they would have two more attempts to write actuarial Exam C

before graduation. STAT 3470 may also be taken in Year 3 or 4, and is prerequisite to STAT 3490, which is listed as a possibility for Year 3.

4. The adding of ACT 4160 Introduction to Property and Casualty Insurance Industry is to replace the old ACT 4000 to fulfill the need for knowledge in Property & Casualty insurance.

5. UM students now only need FIN 2200 to meet the VEE Corporate Finance requirement.

Biochemistry

Program modifications:

Modifications to the following are outlined on the next pages:

- **Bachelor of Science (Major) in Biochemistry**
- **Bachelor of Science (Major) in Biochemistry, Cooperative Option**
- **Bachelor of Science (Honours) in Biochemistry**
- **Bachelor of Science (Honours) in Biochemistry, Cooperative Option**
- Chemistry and Microbiology Option Courses for Biochemistry Honours Students

**BIOCHEMISTRY
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

**Proposed Changes to the B.Sc. Honours and Major Degree in Biochemistry
including Co-op Programs**

Current B.Sc. Biochemistry Honours Option List:

Chemistry and Microbiology Option Courses for Biochemistry Honours Students:

CHEM: 2290, 3360, 3370, 3390, 3400, 3490, 3580, 3590, 4370, 4570, 4580, 4590, 4600, 4640, 4650, 4670, 4680, 4690, 4710 (6)

MBIO: 3000, 3010, 3030, 3280, 3430, 3470, 4010, 4020, 4410, 4440, 4480, 4520, 4530, 4570, 4580, 4600, 4610, 4670 (or 4672)

Option courses no longer offered that may be used if taken prior to their deletion: CHEM 3380, MBIO 2280, MBIO 3440, MBIO 3480, MBIO 4320, MBIO 4470, and MBIO 4510. NOTE: Several of these courses may not be held with current course offerings found on the above option lists. Please refer to the calendar descriptions for more information about specific course restrictions.

Other options may be considered and approved by the program advisor.

Current B.Sc. Biochemistry Honours Co-op Option List:

Chemistry and Microbiology Option Courses for Biochemistry Honours Students:

CHEM: 2290, 3360, 3370, 3390, 3400, 3490, 3580, 3590, 4370, 4570, 4580, 4590, 4600, 4640, 4650, 4670, 4680, 4690, 4710 (6)

MBIO: 3000, 3010, 3030, 3280, 3430, 3470, 4010, 4020, 4410, 4440, 4480, 4520, 4530, 4570, 4580, 4600, 4610, 4670 (or 4672)

Option courses no longer offered that may be used if taken prior to their deletion: CHEM 3380, MBIO 2280, MBIO 3440, MBIO 3480, MBIO 4320, MBIO 4470, and MBIO 4510. NOTE: Several of these courses may not be held with current course offerings found on the above option lists. Please refer to the calendar descriptions for more information about specific course restrictions.

Other options may be considered and approved by the program advisor.

Proposed B.Sc. Biochemistry Honours Option List:

Chemistry and Microbiology Option Courses for Biochemistry Honours Students:

CHEM: 2290, 3360, 3370, 3390, 3400, 3490, 3580, 3590, 4370, 4570, 4580, 4590, **4610 (6)**, 4640, 4650, 4670, 4680, 4690, 4710 (6)

MBIO: 3000, 3010, 3030, 3280, 3430, 3470, 4010, 4020, 4410, 4440, 4480, 4520, 4530, 4570, 4580, 4600, 4610, 4670 (or 4672)

Option courses no longer offered that may be used if taken prior to their deletion: CHEM 3380, **CHEM 4600**, MBIO 2280, MBIO 3440, MBIO 3480, MBIO 4320, MBIO 4470, and MBIO 4510. NOTE: Several of these courses may not be held with current course offerings found on the above option lists. Please refer to the calendar descriptions for more information about specific course restrictions.

Other options may be considered and approved by the program advisor.

Proposed B.Sc. Biochemistry Honours Co-op Option List:

Chemistry and Microbiology Option Courses for Biochemistry Honours Students:

CHEM: 2290, 3360, 3370, 3390, 3400, 3490, 3580, 3590, 4370, 4570, 4580, 4590, **4610 (6)**, 4640, 4650, 4670, 4680, 4690, 4710 (6)

MBIO: 3000, 3010, 3030, 3280, 3430, 3470, 4010, 4020, 4410, 4440, 4480, 4520, 4530, 4570, 4580, 4600, 4610, 4670 (or 4672)

Option courses no longer offered that may be used if taken prior to their deletion: CHEM 3380, **CHEM 4600**, MBIO 2280, MBIO 3440, MBIO 3480, MBIO 4320, MBIO 4470, and MBIO 4510. NOTE: Several of these courses may not be held with current course offerings found on the above option lists. Please refer to the calendar descriptions for more information about specific course restrictions.

Other options may be considered and approved by the program advisor.

Current B.Sc. Biochemistry Honours & Major including Co-op Program Charts:

4.2.2 Biochemistry Programs (offered Jointly by the Departments of Chemistry and Microbiology)

4.2.2 Biochemistry Programs (offered Jointly by the Departments of Chemistry and Microbiology)

YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS			
CHEM 1300, CHEM 1310	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2360, CHEM 2370, CHEM 2400, CHEM 2470	CHEM 3570 MBIO 3410, MBIO 3450, MBIO 3460	CHEM 4360, CHEM 4620, CHEM 4630, CHEM 4700 MBIO 4540
BIOL 1020, BIOL 1030	MBIO 1010, MBIO 2020		
PHYS 1050 (or PHYS 1020), PHYS 1070 (or PHYS 1030)			
MATH 1500 ¹ , MATH 1700 ¹			
In Year 1 or Year 2 the following must be completed:		21 credit hours selected from the list of Microbiology and Chemistry optional courses (listed above).	
6 credit hours from the Faculty of Arts including the University Written English "W" requirement ²		12 credit hours selected from the Faculty of Science ⁵	
3 credit hours chosen from COMP, MATH, or STAT ⁵			
30 Hours	30 Hours	30 Hours	30 Hours
JOINT HONOURS COOPERATIVE OPTION³ 120 CREDIT HOURS			
CHEM 1300, CHEM 1310	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2360, CHEM 2370, CHEM 2400, CHEM 2470	CHEM 3570 MBIO 3410, MBIO 3450, MBIO 3460	CHEM 4360, CHEM 4620, CHEM 4630 MBIO 4540
BIOL 1020, BIOL 1030	MBIO 1010, MBIO 2020		
PHYS 1050 (or PHYS 1020), PHYS 1070 (or PHYS 1030)			
MATH 1500 ¹ , MATH 1700 ¹			
In Year 1 or Year 2 the following must be completed:		24 credit hours selected from the list of Microbiology and Chemistry Optional courses listed above.	
6 credit hours from the Faculty of Arts including the University Written English "W" requirement ²		12 credit hours selected from the Faculty of Science ⁵	
3 credit hours chosen from COMP, MATH, or STAT ⁵		Work Terms: MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	
30 Hours	30 Hours	30 Hours	30 Hours
JOINT FOUR YEAR MAJOR (Including Cooperative Option)^{3,4} 120 CREDIT HOURS			
CHEM 1300, CHEM 1310	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2360, CHEM 2370, CHEM	CHEM 3570 MBIO 3410	CHEM 4630 One of: CHEM 4620, CHEM

BIOL 1020, BIOL 1030	2400, CHEM 2470	One of: MBIO 3450, MBIO 3460, MBIO 4540	4360, CHEM 4370
PHYS 1050 (or 1020), PHYS 1070 (or PHYS 1030)	MBIO 1010, MBIO 2020		
MATH 1500 ¹ , MATH 1700 ¹			
In Year 1 or Year 2 the following must be completed:		24 credit hours of Microbiology and Chemistry (minimum 6 credit hours from each dept.). Of these 24 credit hours, at least 12 hours must be 4000 level courses.	
6 credit hours from the Faculty of Arts including the University Written English "W" requirement ²		21 credit hours of approved electives ⁵	
3 credit hours chosen from COMP, MATH, or STAT ⁵		Work Terms (if Co-op Selected):	
		MBIO 3980, MBIO 3990, MBIO 4980 and / or MBIO 4990	
<p>NOTES:</p> <p>1 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.</p> <p>2 As there are no open electives in Year 2 of the program, students should complete the university written English requirement in Year 1. If not completed in Year 1, a "W" course must be completed prior to Year 3 in addition to the required Year 2 courses.</p> <p>3 IMPORTANT: Students in the cooperative programs must ensure that they are able to satisfy the prerequisites for all 3000 and 4000 level courses they plan to take.</p> <p>4 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.</p> <p>5 MATH 1010, MATH 1020, MATH 1190, COMP 1260, COMP 1270 may not be chosen to satisfy this requirement</p> <p>(Letters in brackets indicate minimum prerequisite standing for further study.)</p>			

Proposed B.Sc. Biochemistry Honours & Major including Co-op Program Charts:

4.2.2 Biochemistry Programs (offered Jointly by the Departments of Chemistry and Microbiology)

YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS			
CHEM 1300, CHEM 1310 BIOL 1020, BIOL 1030 PHYS 1050 (or PHYS 1020), PHYS 1070 (or PHYS 1030) MATH 1500 ¹ , MATH 1700 ¹	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2360, CHEM 2370, CHEM 2400, CHEM 2470 MBIO 1010, MBIO 2020	CHEM 3570 MBIO 3410, MBIO 3450, MBIO 3460	CHEM 4360, CHEM 4620, CHEM 4630, CHEM 4700 MBIO 4540
In Year 1 or Year 2 the following must be completed:		21 credit hours selected from the list of Microbiology and Chemistry optional courses (listed above).	
6 credit hours from the Faculty of Arts including the University Written English "W" requirement ²		12 credit hours selected from the Faculty of Science ⁵	
3 credit hours chosen from COMP, MATH, or STAT ⁵			
30 Hours	30 Hours	30 Hours	30 Hours
JOINT HONOURS COOPERATIVE OPTION³ 120 CREDIT HOURS			
CHEM 1300, CHEM 1310 BIOL 1020, BIOL 1030 PHYS 1050 (or PHYS 1020), PHYS 1070 (or PHYS 1030) MATH 1500 ¹ , MATH 1700 ¹	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2360, CHEM 2370, CHEM 2400, CHEM 2470 MBIO 1010, MBIO 2020	CHEM 3570 MBIO 3410, MBIO 3450, MBIO 3460	CHEM 4360, CHEM 4620, CHEM 4630 MBIO 4540
In Year 1 or Year 2 the following must be completed:		24 credit hours selected from the list of Microbiology and Chemistry Optional courses listed above.	
6 credit hours from the Faculty of Arts including the University Written English "W" requirement ²		12 credit hours selected from the Faculty of Science ⁵	
3 credit hours chosen from COMP, MATH, or STAT ⁵		Work Terms:	
		MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	
30 Hours	30 Hours	30 Hours	30 Hours
JOINT FOUR YEAR MAJOR (Including Cooperative Option)^{3,4} 120 CREDIT HOURS			
CHEM 1300, CHEM 1310 BIOL 1020, BIOL 1030	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2360, CHEM 2370, CHEM 2400,	CHEM 3570 MBIO 3410 One of: MBIO 3450,	CHEM 4630 One of: CHEM 4620, CHEM 4360, CHEM 4370

PHYS 1050 (or 1020), PHYS 1070 (or PHYS 1030)	CHEM 2470 MBIO 1010, MBIO 2020	MBIO 3460, MBIO 4540	
MATH 1500 ¹ , MATH 1700 ¹			
In Year 1 or Year 2 the following must be completed:		24 credit hours of Microbiology and Chemistry (minimum 6 credit hours from each dept.). Of these 24 credit hours, at least 12 hours must be 4000 level courses.	
6 credit hours from the Faculty of Arts including the University Written English "W" requirement ²		21 credit hours of approved electives ⁵	
3 credit hours chosen from COMP, MATH, or STAT ⁵		Work Terms (if Co-op Selected):	
		MBIO 3980, MBIO 3990, MBIO 4980 and / or MBIO 4990	
NOTES:			
1 MATH 1230 or 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1232 or 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.			
2 As there are no open electives in Year 2 of the program, students should complete the university written English requirement in Year 1. If not completed in Year 1, a "W" course must be completed prior to Year 3 in addition to the required Year 2 courses.			
3 IMPORTANT: Students in the cooperative programs must ensure that they are able to satisfy the prerequisites for all 3000 and 4000 level courses they plan to take.			
4 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.			
5 MATH 1010, MATH 1020, MATH 1190, COMP 1260, COMP 1270 may not be chosen to satisfy this requirement			
(Letters in brackets indicate minimum prerequisite standing for further study.)			

Summary:

1. Remove CHEM 4600 from the Option List and add it to the list of courses no longer offered, but that may be used if taken prior to their deletion.
2. Add CHEM 4610 to the Option List.
3. Add newly proposed Math courses as options for Calculus 1 and 2 component of the degree.

Rationale:

1. CHEM 4600 is no longer offered.
2. CHEM 4600 was replaced by CHEM 4610.
3. The newly proposed Math courses are suitable options for students to complete the Calculus 1 & 2 component of the degree.

Biological Sciences

Modification:

BIOL 4542 Genes and Development Cr.Hrs. 3 0.0
(Formerly ZOOL 4270) An in depth examination of selected topics in embryonic development, emphasizing the genetic control of the cell and molecular mechanisms that direct embryogenesis. The course emphasizes hypothesis testing and the evolution of development, including studies of both animal and plant development. Prerequisites: BIOL 2520 (or the former ZOOL 2280, 022.228) or BIOL 2521 (or the former ZOOL 2281) (C) and BIOL 3542 (or the former BIOL 2540, ZOOL 2150, 022.215) (C) or consent of department.

NET CHANGE IN CREDIT HOURS: 0.0

Program modifications:

Modifications to the following programs, including all of the Theme Areas, are outlined on the following pages:

- **Bachelor of Science (Honours) in Biological Sciences**
- **Bachelor of Science (Honours) in Biological Sciences, Cooperative Option**
- **Bachelor of Science (Major) in Biological Sciences**
- **Bachelor of Science (Major) in Biological Sciences, Cooperative Option**
- **Bachelor of Science (General) in Biological Sciences**

**BIOLOGICAL SCIENCES
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

**Proposed Changes to the B.Sc. Honours and Major Degrees including Co-op in
Biological Sciences**

**B.Sc. Honours and Major Degree, in Biological Sciences: Cell, Molecular and
Developmental Biology Theme as approved by Senate, December 2014:**

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS: Cell, Molecular and Developmental Biology Theme (incl. Co-op) 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 One additional course from either Group A or Group B Either both of CHEM 2770 and CHEM 2780; or all three of CHEM 2210, CHEM 2360, and CHEM 2370 (theme courses)	BIOL 3100, BIOL 3300 BIOL 3542 (theme course) Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472	BIOL 4100 (6)
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W" course		Work Terms (if Co-op Selected): BIOL 3980, BIOL 3990	Work Terms (if Co-op Selected): BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours
UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
4-YEAR MAJOR: Cell, Molecular and Developmental Biology Theme (incl. Co-op)² 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030	BIOL 2300, BIOL 2500, BIOL 2520	BIOL 3300	

CHEM 1300, CHEM 1310	2520	BIOL 3542 (theme course)	
STAT 1000	Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 One additional course from either Group A or Group B Either both of CHEM 2770 and CHEM 2780; or all three of CHEM 2210, CHEM 2360, and CHEM 2370 (theme courses)	Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 30 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). Enough elective credit hours required to total 120 credit hours for the program.	
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W" course		Cooperative Option Requirements (if selected): BIOL 3980, BIOL 3990	Cooperative Option Requirements (if selected): BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

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

2. IMPORTANT: The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 30 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

Proposed B.Sc. Honours and Major Degree, in Biological Sciences: Cell, Molecular and Developmental Biology Theme:

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS: Cell, Molecular and Developmental Biology Theme (incl. Co-op) 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 One additional course from either Group A or Group B Either both of CHEM 2770 and CHEM 2780; or all three of CHEM 2210, CHEM 2360, and CHEM 2370 (theme courses)	BIOL 3100, BIOL 3300 BIOL 3542 ⁴ (theme course) Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472	BIOL 4100 (6) 30 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). Enough elective credit hours required to total 120 credit hours for the program.
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W" course		Work Terms (if Co-op Selected): BIOL 3980, BIOL 3990	Work Terms (if Co-op Selected): BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours
YEAR 1	YEAR 2	YEAR 3	YEAR 4
4-YEAR MAJOR: Cell, Molecular and Developmental Biology Theme (incl. Co-op)² 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 One additional course from either Group A or Group B Either both of CHEM 2770 and CHEM 2780; or all three of CHEM 2210, CHEM 2360, and CHEM 2370 (theme courses)	BIOL 3300 BIOL 3542 ⁴ (theme course) Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 30 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). Enough elective credit hours required to total 120 credit hours for the program.	

In Year 1 or Year 2 the following must be completed:	Cooperative Option Requirements	Cooperative Option Requirements (if selected):
3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050	(if selected):	BIOL 4980, BIOL 4990 (if necessary)
6 credit hours from the Faculty of Arts, including a required "W" course	BIOL 3980, BIOL 3990	
30 Hours	30 Hours	30 Hours

NOTES:

1. **MATH 1230**, MATH 1510, MATH 1520, or MATH 1690 may be taken in place of MATH 1500; **MATH 1220** or MATH 1310 may be taken in place of MATH 1300; **MATH 1240 may be taken in place of MATH 1200.**

2. **IMPORTANT:** The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 30 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

4. The former BIOL 2540 may be used in place of BIOL 3542.

(The number 6 in brackets indicates a six credit hour course.)

Current B.Sc. Honours and Major Degree, in Biological Sciences: Ecology and Environmental Biology Theme:

HONOURS: Ecology and Environmental Biology Theme (incl. Co-operative Option) 120 CREDIT HOURS			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000, STAT 2000 (theme course)	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 One additional course from either Group A or Group B	BIOL 3100, BIOL 3300 BIOL 3310, BIOL 3312, BIOL 3314 (theme courses) Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 21 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). 15 credit hours of approved electives	BIOL 4100 (6)
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W" course 15 credit hours of approved electives		Work Terms (if Co-op Selected): BIOL 3980, BIOL 3990	Work Terms (if Co-op Selected): BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours
YEAR 1	YEAR 2	YEAR 3	YEAR 4
4-YEAR MAJOR: Ecology and Environmental Biology Theme (incl. Co-op)² 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000, STAT 2000 (theme course)	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 One additional course from either Group A or Group B	BIOL 3300 BIOL 3310, BIOL 3312, BIOL 3314 (theme courses). Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 21 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). Enough elective credit hours required to total 120 credit hours for the program.	
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH		Cooperative Option Requirements	Cooperative Option Requirements

1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050	(if selected):	(if selected):
6 credit hours from the Faculty of Arts, including a required "W" course	BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hour

NOTES:

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

2. IMPORTANT: The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 30 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

(The number 6 in brackets indicates a six credit hour course.)

Proposed B.Sc. Honours and Major Degree, in Biological Sciences: Ecology and Environmental Biology Theme:

HONOURS: Ecology and Environmental Biology Theme (incl. Co-operative Option) 120 CREDIT HOURS			
BIOL 1020, BIOL 1030	BIOL 2300, BIOL 2500, BIOL 2520	BIOL 3100, BIOL 3300	BIOL 4100 (6)
CHEM 1300, CHEM 1310	Choose one course from each of:	BIOL 3310, BIOL 3312, BIOL 3314 (theme courses)	
STAT 1000, STAT 2000 (theme course)	Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 One additional course from either Group A or Group B	Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 21 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor).	
In Year 1 or Year 2 the following must be completed:		Work Terms (if Co-op Selected):	Work Terms (if Co-op Selected):
3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
6 credit hours from the Faculty of Arts, including a required "W" course			
15 credit hours of approved electives			
30 Hours	30 Hours	30 Hours	30 Hours
YEAR 1	YEAR 2	YEAR 3	YEAR 4
4-YEAR MAJOR: Ecology and Environmental Biology Theme (incl. Co-op)² 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030	BIOL 2300, BIOL 2500, BIOL 2520	BIOL 3300	
CHEM 1300, CHEM 1310	Choose one course from each of:	BIOL 3310, BIOL 3312, BIOL 3314 (theme courses).	
STAT 1000, STAT 2000 (theme course)	Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 One additional course from either Group A or Group B	Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 21 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). Enough elective credit hours required to total 120 credit hours for the program.	
In Year 1 or Year 2 the following must be completed:		Cooperative Option Requirements	Cooperative Option Requirements
3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		(if selected):	(if selected):
6 credit hours from the Faculty of Arts, including a required "W" course		BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hour

NOTES:

1. **MATH 1230**, MATH 1510, MATH 1520, or MATH 1690 may be taken in place of MATH 1500; **MATH 1220** or MATH 1310 may be taken in place of MATH 1300; **MATH 1240 may be taken in place of MATH 1200.**

2. **IMPORTANT:** The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 30 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

(The number 6 in brackets indicates a six credit hour course.)

Current B.Sc. Honours and Major Degree, in Biological Sciences: Environmental and Integrative Physiology Theme:

HONOURS: Environmental and Integrative Physiology Theme (incl. Co-op) 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 Plus one additional course from either Group A or Group B Either both of CHEM 2770 and CHEM 2780; or all three of CHEM 2210, CHEM 2360, and CHEM 2370 (theme courses).	BIOL 3100, BIOL 3300 Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 Choose two of: BIOL 3470, BIOL 3472, BIOL 3400 (the former BIOL 3450) (if not already taken), or BIOL 3452 (theme courses).	BIOL 4100 (6)
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W" course		Work Terms (if Co-op Selected): BIOL 3980, BIOL 3990	Work Terms (if Co-op Selected): BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours
4-YEAR MAJOR: Environmental and Integrative Physiology Theme (incl. Co-op)² 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260	BIOL 3300 Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 Choose two of: BIOL 3470, BIOL 3472, BIOL 3450 (if not already taken), or BIOL 3452 (theme courses). 24 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor).	

	Plus one additional course from either Group A or Group B. Either both of CHEM 2770 and CHEM 2780; or all three of CHEM 2210, CHEM 2360, and CHEM 2370 (theme courses).	Enough elective credit hours required to total 120 credit hours for the program.	
In Year 1 or Year 2 the following must be completed:		Cooperative Option Requirements	Cooperative Option Requirements
3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		(if selected):	(if selected):
6 credit hours from the Faculty of Arts, including a required "W" course		BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

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

2. IMPORTANT: The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 30 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

(The number 6 in brackets indicates a six credit hour course.)

**Proposed B.Sc. Honours and Major Degree, in Biological Sciences:
Environmental and Integrative Physiology Theme:**

HONOURS: Environmental and Integrative Physiology Theme (incl. Co-op) 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 Plus one additional course from either Group A or Group B Either both of CHEM 2770 and CHEM 2780; or all three of CHEM 2210, CHEM 2360, and CHEM 2370 (theme courses).	BIOL 3100, BIOL 3300 Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 Choose two of: BIOL 3470, BIOL 3472, BIOL 3400 (the former BIOL 3450) (if not already taken), or BIOL 3452 (theme courses). 24 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). Enough elective credit hours required to total 120 credit hours for the program.	BIOL 4100 (6)
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W" course 30 Hours		Work Terms (if Co-op Selected): BIOL 3980, BIOL 3990 30 Hours	Work Terms (if Co-op Selected): BIOL 4980, BIOL 4990 (if necessary) 30 Hours
4-YEAR MAJOR: Environmental and Integrative Physiology Theme (incl. Co-op)² 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 Plus one additional course from either Group A or Group B. Either both of CHEM 2770 and CHEM 2780; or all three of CHEM 2210, CHEM 2360, and CHEM 2370 (theme courses).	BIOL 3300 Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 Choose two of: BIOL 3470, BIOL 3472, BIOL 3450 (if not already taken), or BIOL 3452 (theme courses). 24 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). Enough elective credit hours required to total 120 credit hours for the program.	

In Year 1 or Year 2 the following must be completed:	Cooperative Option Requirements	Cooperative Option Requirements
3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050	(if selected):	(if selected):
6 credit hours from the Faculty of Arts, including a required "W" course	BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours

NOTES:

1. **MATH 1230**, MATH 1510, MATH 1520, or MATH 1690 may be taken in place of MATH 1500; **MATH 1220** or MATH 1310 may be taken in place of MATH 1300; **MATH 1240** may be taken in place of MATH 1200.

2. IMPORTANT: The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 30 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

(The number 6 in brackets indicates a six credit hour course.)

Current B.Sc. Honours and Major Degree, in Biological Sciences: Evolution and Biodiversity Theme:

HONOURS: Evolution and Biodiversity Theme (incl. Co-operative Option) 120 CREDIT HOURS			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 Plus one additional course from either Group A or Group B	BIOL 3100, BIOL 3300 Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 3 credit hours chosen from the Evolutionary Processes List (A) above. 3 credit hours chosen from the Biodiversity course List (B) above. 24 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). 15 credit hours of approved electives	BIOL 4100 (6)
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W" course 18 credit hours of approved electives		Cooperative Option Requirements (if Selected): BIOL 3980, BIOL 3990	Cooperative Option Requirements (if Selected): BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours
4-YEAR MAJOR: Evolution and Biodiversity Theme (incl. Co-op)² 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Choose one course from each of: Group A: BIOL 2200, BIOL 2210 Group B: BIOL 2240, BIOL 2242, BIOL 2260 Plus one additional course from either Group A or Group B	BIOL 3300 Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 3 credit hours chosen from the Evolutionary Processes List (A) above. 3 credit hours chosen from the Biodiversity course List (B) above. 24 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor). Enough elective credit hours required to total 120 credit hours	

		for the program.	
In Year 1 or Year 2 the following must be completed:		Cooperative Option Requirements	Cooperative Option Requirements
3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		(if selected):	(if selected):
6 credit hours from the Faculty of Arts, including a required "W" course		BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

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

2. IMPORTANT: The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 24 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

(The number 6 in brackets indicates a six credit hour course.)

Proposed B.Sc. Honours and Major Degree, in Biological Sciences: Evolution and Biodiversity Theme:

HONOURS: Evolution and Biodiversity Theme (incl. Co-operative Option) 120 CREDIT HOURS			
BIOL 1020, BIOL 1030	BIOL 2300, BIOL 2500, BIOL 2520	BIOL 3100, BIOL 3300	BIOL 4100 (6)
CHEM 1300, CHEM 1310	Choose one course from each of:	Choose one of the following:	
STAT 1000	Group A: BIOL 2200, BIOL 2210	BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472	
	Group B: BIOL 2240, BIOL 2242, BIOL 2260	3 credit hours chosen from the Evolutionary Processes List (A) above.	
	Plus one additional course from either Group A or Group B	3 credit hours chosen from the Biodiversity course List (B) above.	
		24 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor).	
		15 credit hours of approved electives	
In Year 1 or Year 2 the following must be completed:		Cooperative Option Requirements (if Selected):	Cooperative Option Requirements (if Selected):
3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
6 credit hours from the Faculty of Arts, including a required "W" course			
18 credit hours of approved electives			
30 Hours	30 Hours	30 Hours	30 Hours
4-YEAR MAJOR: Evolution and Biodiversity Theme (incl. Co-op)² 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030	BIOL 2300, BIOL 2500, BIOL 2520	BIOL 3300	
CHEM 1300, CHEM 1310	Choose one course from each of:	Choose one of the following:	
STAT 1000	Group A: BIOL 2200, BIOL 2210	BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472	
	Group B: BIOL 2240, BIOL 2242, BIOL 2260	3 credit hours chosen from the Evolutionary Processes List (A) above.	
	Plus one additional course from either Group A or Group B	3 credit hours chosen from the Biodiversity course List (B) above.	
		24 credit hours of 3000 or 4000 level Biology courses ³ (courses from outside Biology may be approved by the theme advisor).	
		Enough elective credit hours required to total 120 credit hours for the program.	
In Year 1 or Year 2 the following must be completed:		Cooperative Option Requirements	Cooperative Option Requirements
3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		(if selected):	(if selected):

6 credit hours from the Faculty of Arts, including a required "W" course	BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours

NOTES:

1. **MATH 1230**, MATH 1510, MATH 1520, or MATH 1690 may be taken in place of MATH 1500; **MATH 1220** or MATH 1310 may be taken in place of MATH 1300; **MATH 1240** may be taken in place of **MATH 1200**.

2. **IMPORTANT:** The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 24 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

(The number 6 in brackets indicates a six credit hour course.)

Current B.Sc. Honours and Major Degree, in Biological Sciences: Integrative Biology Theme:

HONOURS: Integrative Biology Theme (incl. Co-operative Option) 120 CREDIT HOURS			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Required Theme courses: BIOL 2200, BIOL 2210, BIOL 2240, BIOL 2242 MBIO 1010 CHEM 2770 and CHEM 2780 or CHEM 2210, CHEM 2360, CHEM 2370	BIOL 3100, BIOL 3300 Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 24 credit hours of 3000 or 4000 level Biological Sciences courses ³ 6 credit hours of 3000 or 4000 level Microbiology courses Enough elective credit hours required to total 120 credit hours for the program.	BIOL 4100 (6)
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W" course 12 credit hours of approved electives		Work Terms (if Co-op Selected): BIOL 3980, BIOL 3990	Work Terms (if Co-op Selected): BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours
4-YEAR MAJOR: Integrative Biology Theme (incl. Co-op) 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 STAT 1000	BIOL 2300, BIOL 2500, BIOL 2520 Required Theme course: BIOL 2200, BIOL 2210, BIOL 2240, BIOL 2242 MBIO 1010 CHEM 2770 and CHEM 2780; or CHEM 2210, CHEM 2360, CHEM 2370	BIOL 3300 Choose one of the following: BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472 24 credit hours of 3000 or 4000 level Biology courses ³ 6 credit hours of 3000 or 4000 level Microbiology courses Enough elective credit hours required to total 120 credit hours for the program.	
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 6 credit hours from the Faculty of Arts, including a required "W"		Cooperative Option Requirements (if selected): BIOL 3980, BIOL 3990	Cooperative Option Requirements (if selected): BIOL 4980, BIOL 4990 (if

course			necessary)
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

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

2. IMPORTANT: The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 24 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

(The number 6 in brackets indicates a six credit hour course.)

Proposed B.Sc. Honours and Major Degree, in Biological Sciences: Integrative Biology Theme:

HONOURS: Integrative Biology Theme (incl. Co-operative Option) 120 CREDIT HOURS			
BIOL 1020, BIOL 1030	BIOL 2300, BIOL 2500, BIOL 2520	BIOL 3100, BIOL 3300	BIOL 4100 (6)
CHEM 1300, CHEM 1310	Required Theme courses:	Choose one of the following:	
STAT 1000	BIOL 2200, BIOL 2210, BIOL 2240, BIOL 2242	BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472	
	MBIO 1010	24 credit hours of 3000 or 4000 level Biological Sciences courses ³	
	CHEM 2770 and CHEM 2780 or CHEM 2210, CHEM 2360, CHEM 2370	6 credit hours of 3000 or 4000 level Microbiology courses	
		Enough elective credit hours required to total 120 credit hours for the program.	
In Year 1 or Year 2 the following must be completed:		Work Terms (if Co-op Selected):	Work Terms (if Co-op Selected):
3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
6 credit hours from the Faculty of Arts, including a required "W" course			
12 credit hours of approved electives			
30 Hours	30 Hours	30 Hours	30 Hours
4-YEAR MAJOR: Integrative Biology Theme (incl. Co-op) 120 CREDIT HOURS (Courses listed in chart below and electives)			
BIOL 1020, BIOL 1030	BIOL 2300, BIOL 2500, BIOL 2520	BIOL 3300	
CHEM 1300, CHEM 1310	Required Theme course:	Choose one of the following:	
STAT 1000	BIOL 2200, BIOL 2210, BIOL 2240, BIOL 2242	BIOL 3400 (the former BIOL 3450), BIOL 3470, BIOL 3472	
	MBIO 1010	24 credit hours of 3000 or 4000 level Biology courses ³	
	CHEM 2770 and CHEM 2780; or CHEM 2210, CHEM 2360, CHEM 2370	6 credit hours of 3000 or 4000 level Microbiology courses	
		Enough elective credit hours required to total 120 credit hours for the program.	
In Year 1 or Year 2 the following must be completed:		Cooperative Option Requirements	Cooperative Option Requirements
3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		(if selected):	(if selected):
6 credit hours from the Faculty of Arts, including a required "W" course		BIOL 3980, BIOL 3990	BIOL 4980, BIOL 4990 (if necessary)
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1. **MATH 1230**, MATH 1510, MATH 1520, or MATH 1690 may be taken in place of MATH 1500; **MATH 1220** or MATH 1310 may be taken in place of MATH 1300; **MATH 1240 may be taken in place of MATH 1200.**

2. IMPORTANT: The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.

3. Courses from other departments or faculties may be acceptable for use towards the 24 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.

(The number 6 in brackets indicates a six credit hour course.)

Summary:

1. Add newly proposed Math courses as optional substitutions in the Notes section of the program chart.
2. Add a footnote to the Cell, Molecular, Developmental theme that indicates that the former BIOL 2540 may be used in place of BIOL 3542.

Rationale:

1. The newly proposed Math courses are suitable options for students in the B.Sc. Honours or Major degrees in Biological Sciences.
2. BIOL 2540 was recently deleted and replaced by BIOL 3542.

Proposed Change to the Biological Sciences – General Degree and Minor Requirements Chart:

Current Biological Sciences – General Degree and Minor Requirements Chart:

GENERAL DEGREE (90 credit hours)	
BIOL 1020, BIOL 1030	<p>18 credit hours of 2000, 3000, and (or) 4000 level Biological Sciences courses (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level.);</p> <p>or</p> <p>Students may choose all 36 credit hours of advanced level courses from the Department of Biological Sciences as long as courses are selected following the provisions outlined below:</p> <p>Each of BIOL 2300, BIOL 2500, BIOL 2520; one of BIOL 2200 or BIOL 2210; one of BIOL 2240, BIOL 2242 or BIOL 2260; plus 21 additional credit hours from the Biological Sciences including at least 6 credit hours at the 3000 or 4000 level⁴.</p>
MINOR	
BIOL 1020 and BIOL 1030	12 credit hours from 2000, 3000, and/or 4000 level Biology courses.

NOTES:

1. MATH 1610, MATH 1620, or MATH 1690 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300.
2. **IMPORTANT:** The programs need not be completed in the manner prescribed in the chart above. The charts indicate one possible arrangement of the 120 credit hours that make up the degree and are meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. These 120 credit hours are a combination of the courses outlined in the charts above and elective courses chosen by the student in consultation with the program advisors.
3. Courses from other departments or faculties may be acceptable for use towards the 30 credit hours of 3000/4000 level Biological Sciences courses required in the Honours and Major Degree programs. Please consult with the department for permission to use alternate courses.
4. Students should confirm the new regulations of the B.Sc. General Degree with a Faculty of Science Academic Advisor if they wish to choose 36 hours of advanced level study from the Department of Biological Sciences. (The number 6 in brackets indicates a 6 credit hour course.)

Proposed Biological Sciences – General Degree and Minor Requirements Chart:

GENERAL DEGREE (90 credit hours)	
BIOL 1020, BIOL 1030	<p>18 credit hours of 2000, 3000, and (or) 4000 level Biological Sciences courses (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level.);</p> <p>or</p> <p>Students may choose all 36 credit hours of advanced level courses from the Department of</p>

	Biological Sciences as long as courses are selected following the provisions outlined below: Each of BIOL 2300, BIOL 2500, BIOL 2520; one of BIOL 2200 or BIOL 2210; one of BIOL 2240, BIOL 2242 or BIOL 2260; plus 21 additional credit hours from the Biological Sciences including at least 6 credit hours at the 3000 or 4000 level ¹ .
MINOR	
BIOL 1020 and BIOL 1030	12 credit hours from 2000, 3000, and/or 4000 level Biology courses.

NOTES:

1. Students should confirm the new regulations of the B.Sc. General Degree with a Faculty of Science Academic Advisor if they wish to choose 36 hours of advanced level study from the Department of Biological Sciences.

Summary & Rationale:

1. The first 3 footnotes attached to the General Degree and Minor Requirements Chart in the Biological Sciences section of the Calendar did not apply to that chart, therefore they should be removed.

Biotechnology

Program modifications:

Modifications to the following programs are detailed on the next pages:

- **Bachelor of Science (Joint Honours) in Biotechnology**
- **Bachelor of Science (Joint Honours) in Biotechnology, Cooperative Option**
- **Bachelor of Science (Joint Major) in Biotechnology**
- **Bachelor of Science (Joint Major) in Biotechnology, Cooperative Option**

**BIOTECHNOLOGY
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

**Proposed Changes to the B.Sc. Honours and Major Degree in Biotechnology
including Co-op Programs**

Current Biotechnology Requirements:

Biotechnology Honours Degree Requirements

To enter the Biotechnology Joint Honours program a student must have completed at least 24 credit hours with a minimum GPA of 3.00, and also obtained a minimum grade of "B" in CHEM 1310 and a minimum grade of "C+" in BIOL 1020. CHEM 1300, BIOL 1030, MATH 1500, PHYS 1020 (or PHYS 1050), and STAT 1000 are required courses in the program and students are strongly encouraged to complete these courses in first year. Six credit hours of Arts electives, including the written English course should also be taken in Year 1.

Biotechnology 4-Year Major Degree Requirements

To enter the Biotechnology Joint Major program a student must have completed at least 24 credit hours with a minimum GPA of 2.00 and also obtained a minimum grade of "C+" in CHEM 1310 and a minimum grade of "C" in BIOL 1020. BIOL 1030, CHEM 1300, MATH 1500, PHYS 1020 or 1050, and STAT 1000 are required courses in the program and students are strongly urged to complete these courses in first year. Six credit hours of Arts electives, including the written English course should also be taken in Year 1.

Program Stream Courses:

Analytical Biotechnology: MATH 1700¹, CHEM 4370, CHEM 4590, CHEM 4670, CHEM 4700

Molecular Biotechnology: BIOL 4550, MBIO 4600, MBIO 4610, MBIO 4672

Recommended General Electives if not required in Program stream:

All courses in above described Minors.

Appropriate pre-requisites must also be taken for all Electives.

BIOE 3200, BIOE 3530, BIOE 4510, BIOL 1300 (BOTN 1010), BIOL 2242 (BOTN 2010), BIOL 2380 (BOTN/ZOOL 2180), BIOL 2260 (BOTN 2210), BIOL 2300 (BOTN/ZOOL 2370), BIOL 3550 (BOTN 3190), BIOL 3290 (BOTN 3280), BIOL 3500 (BOTN 3460), BIOL 4500 (BOTN 4180), ~~BIOL 4550 (BOTN 4460)~~, ~~BIOL 2540 (ZOOL 2150)~~, ~~BIOL 3540 (ZOOL 3070)~~, BIOL 4540 (ZOOL 4150); CHEM 4360, CHEM 4370, CHEM 4590, CHEM 4620, CHEM 4670, CHEM 4700; COMP 1010, COMP 1020, COMP 1260, COMP 1270; ENG 1420; ENTR 2020; MATH 1700¹; MBIO 3280 (MBIO 2280), MBIO 3010, MBIO 3430, MBIO 4440 (MBIO 3440), MBIO 3450, MBIO 3460, MBIO 3470, MBIO 4480 (MBIO 3480), MBIO 4010, MBIO 4410, MBIO 4470, MBIO 4600, MBIO 4610, MBIO 4672; PHAC 4030, PHAC 4040; PHIL 2740, PHIL 2830; PLNT 3140, PLNT 3500, PLNT 3520, PLNT 3570, PLNT 4310, PLNT 4330, PLNT 4550, PLNT 4560, PLNT 4570, PLNT 4580, PLNT 4590, PLNT 4600; STAT 2000

4.4.2 Biotechnology Programs (incl. Co-operative Option if selected) - Offered Jointly by the Departments of Chemistry and Microbiology			
UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS (incl. Co-operative Option if selected) 120 credit hours			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 PHYS 1020 (or PHYS 1050) MATH 1500 ¹ STAT 1000	CHEM 2210, CHEM 2220, CHEM 2360 (MBIO 2360), CHEM 2370 (MBIO 2370), CHEM 2470 MBIO 1010, MBIO 2020 BIOL 2500, BIOL 2520	CHEM 3590 MBIO 3000, MBIO 3030, MBIO 3410 PLNT-2530	CHEM 4630 MBIO 4520 BIOL 4560, BTEC 4000 (6) ⁴ , PLNT 4610
The requirements listed below can be completed in U1 or Year 2: 6 credit hours from the Faculty of Arts including the required "W" course 6 credit hours of Required Program Stream ² courses or electives ³		The requirements listed below can be completed in 3rd or 4th year: 27 credit hours of Required Program Stream courses ² and electives ³ . Work Terms (if Co-op Selected): BTEC 3980, BTEC 3990	
30 Hours	30 Hours	30 Hours	30 Hours
JOINT 4-YEAR MAJOR (incl. Co-operative Option if selected) 120 credit hours			
BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310 PHYS 1020 (or PHYS 1050) MATH 1500 ¹ STAT 1000	CHEM 2210, CHEM 2220, CHEM 2360 (MBIO 2360), CHEM 2370 (MBIO 2370), CHEM 2470 MBIO 1010, MBIO 2020 BIOL 2500, BIOL 2520	CHEM 3590 MBIO 3000, MBIO 3030, MBIO 3410 PLNT-2530	CHEM 4630 MBIO 4520 BIOL 4560 PLNT 4610
The requirements listed below can be completed in U1 or Year 2: 6 credit hours from the Faculty of Arts including the required "W" course		The requirements listed below can be completed during 3rd and 4th year: 33 credit hours of Required Program Stream Courses ² and approved electives ³ . Work Terms (if Co-op	
		Work Terms (if Co-op	

6 credit hours of Required Program Stream Courses ² and / or approved electives ³	Selected): BTEC 3980, BTEC 3990	Selected): BTEC 4980 and /or BTEC 4990
<p>NOTES:</p> <p>1. MATH 1510 or 1520 may be used in place of MATH 1500; MATH 1710 may be used in place of MATH 1700.</p> <p>2. Program stream courses requirements can be found above the Biotechnology program charts in section 4.4.1.</p> <p>3. Refer to list of recommended elective courses and complementary Minor programs (listed above charts) prior to registration in your electives.</p> <p>4. BTEC 4000 is required for students in the Honours program only. Students in the Honours Co-operative program will require 6 credit hours of approved electives.</p> <p>(The number 6 in brackets indicates a 6 credit hour course.)</p>		

Proposed Biotechnology Requirements:

Biotechnology Honours Degree Requirements

To enter the Biotechnology Joint Honours program a student must have completed at least 24 credit hours with a minimum GPA of 3.00, and also obtained a minimum grade of "B" in CHEM 1310 and a minimum grade of "C+" in BIOL 1020. CHEM 1300, BIOL 1030, MATH 1500¹, PHYS 1020 (or PHYS 1050), and STAT 1000 are required courses in the program and students are strongly encouraged to complete these courses in first year. Six credit hours of Arts electives, including the written English course should also be taken in Year 1.

Biotechnology 4-Year Major Degree Requirements

To enter the Biotechnology Joint Major program a student must have completed at least 24 credit hours with a minimum GPA of 2.00 and also obtained a minimum grade of "C+" in CHEM 1310 and a minimum grade of "C" in BIOL 1020. BIOL 1030, CHEM 1300, MATH 1500¹, PHYS 1020 (or PHYS 1050), and STAT 1000 are required courses in the program and students are strongly urged to complete these courses in first year. Six credit hours of Arts electives, including the written English course should also be taken in Year 1.

Optional Courses:

Appropriate prerequisites must be taken for all Optional courses.

CHEM 3570, CHEM 4360, CHEM 4670, MBIO 3430, MBIO 4010, MBIO 4410, MBIO 4440, BIOL 3300, BIOL 4554/4556⁵, BIOL 4540, BIOL 4560, PLNT 2530, PLNT 4610, COMP 3820

Program Stream Courses:

Analytical Biotechnology: MATH 1700¹, CHEM 4370, CHEM 4590, CHEM 4670, CHEM 4700

Molecular Biotechnology: BIOL 4554 or BIOL 4556, MBIO 4600, MBIO 4610, MBIO 4672

Recommended General Electives if not required in Program stream:

All courses in above described Minors.

Appropriate pre-requisites must also be taken for all Electives.

BIOE 3200, BIOE 3530, BIOE 4510, BIOL 1300 (BOTN 1010), BIOL 2242 (BOTN 2010), BIOL 2380 (BOTN/ZOOL 2180), BIOL 2260 (BOTN 2210), BIOL 2300 (BOTN/ZOOL 2370), BIOL 3550 (BOTN 3190), BIOL 3290 (BOTN 3280), BIOL 3500 (BOTN 3460), BIOL 4500 (BOTN 4180), **BIOL 3542 (BIOL 2540)**, BIOL 4540 (ZOOL 4150), **BIOL 4544 (BIOL 3540)**; CHEM 4360, CHEM 4370, CHEM 4590, CHEM 4620, CHEM 4670, CHEM 4700; COMP 1010, COMP 1020, COMP 1260, COMP 1270; ENG 1420; ENTR 2020; MATH 1700¹; MBIO 3280 (MBIO 2280), MBIO 3010, MBIO 3430, MBIO 4440 (MBIO 3440), MBIO 3450, MBIO 3460, MBIO 3470, MBIO 4480 (MBIO 3480), MBIO 4010, MBIO 4410, MBIO 4470, MBIO 4600, MBIO 4610, MBIO 4672; PHAC 4030, PHAC 4040; PHIL 2740, PHIL 2830; PLNT 3140, PLNT 3500, PLNT 3520, PLNT 3570, PLNT 4310, PLNT 4330, PLNT 4550, PLNT 4560, PLNT 4570, PLNT 4580, PLNT 4590, PLNT 4600; STAT 2000

4.4.2 Biotechnology Programs (incl. Co-operative Option if selected) - Offered Jointly by the Departments of Chemistry and Microbiology			
UNIVERSITY 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS (incl. Co-operative Option if selected) 120 credit hours			
BIOL 1020, BIOL 1030	CHEM 2210, CHEM 2220, CHEM 2360 (MBIO 2360), CHEM 2370 (MBIO 2370), CHEM 2470	CHEM 3590	CHEM 4630
CHEM 1300, CHEM 1310		MBIO 3000, MBIO 3030, MBIO 3410	MBIO 4520
PHYS 1020 (or PHYS 1050)	MBIO 1010, MBIO 2020		BTEC 4000 (6) ⁴ ,
MATH 1500 ¹	BIOL 2500, BIOL 2520		
STAT 1000			
The requirements listed below can be completed in Year 1 or 2:		The requirements listed below can be completed in 3rd or 4th year:	
6 credit hours from the Faculty of Arts including the required "W" course		9 credit hours of Optional Courses²	
6 credit hours of Required Program Stream² courses or electives ³		27 credit hours of Required Program Stream courses ² and electives ³ .	
		Work Terms (if Co-op Selected):	Work Terms (if Co-op Selected):
		BTEC 3980, BTEC 3990	BTEC 4980 and /or BTEC 4990
30 Hours	30 Hours	30 Hours	30 Hours
JOINT 4-YEAR MAJOR (incl. Co-operative Option if selected) 120 credit hours			
BIOL 1020, BIOL 1030	CHEM 2210, CHEM 2220, CHEM 2360 (MBIO 2360), CHEM 2370 (MBIO 2370), CHEM 2470	CHEM 3590	CHEM 4630
CHEM 1300, CHEM 1310		MBIO 3000, MBIO 3030, MBIO 3410	MBIO 4520
PHYS 1020 (or PHYS 1050)	MBIO 1010, MBIO 2020		
MATH 1500 ¹	BIOL 2500, BIOL 2520		
STAT 1000			
The requirements listed below can be completed in Year 1 or 2:		The requirements listed below can be completed during 3rd and 4th year:	
6 credit hours from the Faculty of Arts including the required "W" course		9 credit hours of Optional Courses²	
		33 credit hours of Required Program	

6 credit hours of Required Program Stream Courses ² and / or approved electives ³	Stream Courses ² and approved electives ³ . Work Terms (if Co-op Selected): BTEC 3980, BTEC 3990	Work Terms (if Co-op Selected): BTEC 4980 and /or BTEC 4990
<p>NOTES:</p> <p>1. MATH 1230 or MATH 1510 or MATH 1520 may be used in place of MATH 1500; MATH 1232 or MATH 1710 may be used in place of MATH 1700.</p> <p>2. Optional courses and program stream courses requirements can be found above the Biotechnology program charts in section 4.4.1.</p> <p>3. Refer to list of recommended elective courses and complementary Minor programs (listed above charts) prior to registration in your electives.</p> <p>4. BTEC 4000 is required for students in the Honours program only. Students in the Honours Co-operative program will require 6 credit hours of approved electives.</p> <p>5. Choice of BIOL 4554 or BIOL 4556 not already chosen for stream.</p> <p>(The number 6 in brackets indicates a 6 credit hour course.)</p>		

Summary of Changes:

1. Proposed new Math courses, based on the Math department curriculum revision, have been added as options.
2. Three required courses were changed from required to optional. Additional optional courses were added.
3. A course in the Molecular Biotechnology stream was deleted and replaced by two different options.
4. Remove BIOL 2540 & BIOL 3540 and add BIOL 3542 & BIOL 4544 to the Recommended General Electives list.

Rationale for Changes:

1. To add the option for students to choose one of the new Math courses.
2. The change from required courses to optional courses was made to give students more flexibility in course choices, partially because of space demand in courses.
3. BIOL 4550 was deleted from the Molecular Biotechnology stream as the course is no longer offered. Students can choose BIOL 4554 or BIOL 4556 instead to provide students options, partially because of space demand in courses.
4. BIOL 2540, Developmental Biology, and BIOL 3540, Advanced Developmental and Cellular Biology were recently deleted, and replaced and renamed by BIOL 3542 and BIOL 4544.

Chemistry

Modification:

CHEM 4610 Advanced Chemical Techniques Cr.Hrs. 6 0.0
(Lab required) A workshop course consisting of lectures, problem solving, and advanced instrumental techniques. The course is designed to train potential research students in techniques like NMR, mass spectroscopy, and chromatography. This course is required of all final year Honours students in Chemistry. Prerequisite: one of CHEM 3360 (002.336) (C), CHEM 3370 (002.337) (C), CHEM 3400 (C), CHEM 3380 (002.338) (C), CHEM 3390 (002.339) (C), CHEM 3590 (002.339) (C), or CHEM 3580 (002.358) (C).

NET CHANGE IN CREDIT HOURS: 0.0

Program modifications:

Modifications to the following programs are outlined on the next pages:

- **Bachelor of Science (Honours) in Chemistry**
- **Bachelor of Science (Honours) in Chemistry, Cooperative Option**

**CHEMISTRY
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Proposed Changes to the B.Sc. Honours in Chemistry including Co-op

B.Sc. Honours in Chemistry Program Chart, as approved by Senate, December 2014

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS* (incl. Co-operative Option if selected) 120 CREDIT HOURS			
CHEM 1300, CHEM 1310 (B) PHYS 1050 (or PHYS 1020) and PHYS 1070 MATH 1500 ¹ , MATH 1700 ¹	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2400, CHEM 2470, CHEM 2860 (CHEM 2360)	CHEM 3400, CHEM 3590	CHEM 4610 (6) CHEM 4710 (6)
In Year 1 or Year 2 the following must be completed: 6 credit hours from the Faculty of Arts, which should include the required "W" course 3 credit hours from Mathematics, Statistics or Computer Science courses ³ 12 credit hours of approved electives in years one and two ⁵		Sufficient credit hours (18) from the 2000, 3000 and 4000 level Chemistry ⁴ courses not yet taken to total a minimum of 63 credit hours of Chemistry courses at the 1000-4000 Level. These credit hours may make up part of a focus area. 9 credit hours of non-Chemistry courses which are part of a designated focus area ⁴ . If no Focus Area is selected, students must choose 9 credit hours of Chemistry courses. 15 credit hours of approved electives in years three and four ⁵	
		Work Terms (if Co-op selected): CHEM 3980, CHEM 3990	Work Terms (if Co-op selected): CHEM 4980 and/or CHEM 4990
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1. 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.

2. ~~PHYS 1020 may be used in place of PHYS 1050; and, in the 3-year degree only, PHYS 1030 may be used in place of PHYS 1070. Students planning on completing a 4-year degree in Chemistry are required to complete PHYS 1070.~~

3. MATH 1010, MATH 1020, MATH 1190, MATH 1191, COMP 1260 and COMP 1270 may not be used to satisfy this requirement.

4. Students may elect to complete the requirements set out in one of the Chemistry focus areas. If a student opts for one of the focus areas, they should consult with the Department of Chemistry and a Science Academic Advisor for information regarding specific course requirements for each focus area.

5- Elective courses should be selected in consultation with the Department of Chemistry and/or a Faculty of Science Academic Advisor.

Proposed B.Sc. Honours in Chemistry Program Chart:

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS³ (incl. Co-operative Option if selected) 120 CREDIT HOURS			
CHEM 1300, CHEM 1310 (B) PHYS 1050(or PHYS 1020), PHYS 1070 MATH 1500 ¹ , MATH 1700 ¹ ,	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2400, CHEM 2470, CHEM 2860 (CHEM 2360)	CHEM 3400, CHEM 3590	CHEM 4610 (6), CHEM 4710 (6)
In Year 1 or Year 2 the following must be completed: 6 credit hours from the Faculty of Arts, which should include the required "W" course 3 credit hours from Mathematics, Statistics or Computer Science courses ² 12 credit hours of approved electives in years one and two		Sufficient credit hours (18) from the 2000, 3000 and 4000 level Chemistry ³ courses not yet taken to total a minimum of 63 credit hours of Chemistry courses at the 1000-4000 Level. These credit hours may make up part of a focus area. 9 credit hours of non-Chemistry ⁵ courses which are part of a designated focus area ³ . If no Focus Area is selected, students must choose 9 credit hours of Chemistry courses. 15 credit hours of approved electives in years three and four ⁴	
		Work Terms (if Co-op selected): CHEM 3980, CHEM 3990	Work Terms (if Co-op selected): CHEM 4980 and/or CHEM 4990
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1. **MATH 1230** or MATH 1510 or MATH 1520 may be taken in place of MATH 1500; **MATH 1232** or MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.

2. MATH 1010, MATH 1020, MATH 1190, MATH 1191, COMP 1260 and COMP 1270 may not be used to satisfy this requirement.

3. Students may elect to complete the requirements set out in one of the Chemistry focus areas. If a student opts for one of the focus areas, they should consult with the Department of Chemistry and a Science Academic Advisor for information regarding specific course requirements for each focus area.

4. Elective courses should be selected in consultation with the Department of Chemistry and/or a Faculty of Science Academic Advisor.

5. Not all Focus Areas include non-Chemistry courses. Some Focus Areas are all Chemistry courses. Refer to the description of each Focus Area for more information.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Summary:

1. Add the newly proposed Math courses as suitable options in the footnotes to the program chart.
2. Delete a statement about PHYS 1030 related to the General degree, which resulted in a renumbering of the footnotes.
3. Add a footnote about the content of Focus Areas.

Rationale:

1. The newly proposed Math courses are suitable options for students in the Chemistry Honours program.
2. The statement regarding PHYS 1030 as it relates to the General degree does not belong in this portion of the chart.
3. The footnote about the Focus Areas is to provide students with the information that not all Focus Areas include non-Chemistry courses.

Program modification:

Modifications to the following programs are outlined on the next pages:

- **Bachelor of Science (Major) in Chemistry**
- **Bachelor of Science (Major) in Chemistry, Cooperative Option**

Proposed Changes to the B.Sc. Major in Chemistry including Co-op

B.Sc. Major in Chemistry Program as approved by Senate, December 2014:

4-YEAR MAJOR^{4,5} (incl. Co-operative Option if selected) 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
CHEM 1300, CHEM 1310 (C+)	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2400, CHEM 2470, CHEM 2860 (CHEM 2360)	CHEM 3400, CHEM 3590	CHEM 4610 (6)
PHYS 1050 (or PHYS 1020 (C+)) and PHYS 1070			
MATH 1500 ¹ , MATH 1700 ¹			
In Year 1 or Year 2 the following must be completed:		Sufficient credit hours (18) from the 2000, 3000 and 4000 level Chemistry ⁶ courses not yet taken to total a minimum of 57 credit hours of Chemistry courses at the 1000-4000 Level. These credit hours may make up part of a focus area.	
6 credit hours from the Faculty of Arts, which should include the required "W" course.		9 credit hours of non-Chemistry courses which are part of a designated focus area ⁶ . (Note: If no Focus Area is selected, students must choose 9 credit hours of Chemistry courses.)	
3 credit hours from Mathematics, Statistics or Computer Science courses ³		Work Terms (if Co-op selected):	Work Terms (if Co-op selected):
		CHEM 3980, CHEM 3990	CHEM 4980 and/or CHEM 4990
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1. 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.
2. ~~PHYS 1020 may be used in place of PHYS 1050; and, in the 3-year degree only, PHYS 1030 may be used in place of PHYS 1070. Students planning on completing a 4-year degree in Chemistry are required to complete PHYS 1070.~~
3. MATH 1010, MATH 1020, MATH 1190, MATH 1191, COMP 1260 and COMP 1270 may not be used to satisfy this requirement.
4. Students may elect to complete the requirements set out in one of the Chemistry focus areas. If a student opts for one of the focus areas, they should consult with the Department of Chemistry and a Science Academic Advisor for information regarding specific course requirements for each focus area.
5. 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.
6. Elective courses should be selected in consultation with the Department of Chemistry and/or a Faculty of

Science Academic Advisor.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed B.Sc. Major in Chemistry Program Chart:

4-YEAR MAJOR^{3,4} (incl. Co-operative Option if selected) 120 CREDIT HOURS (comprising courses listed in chart below, and electives ⁵)			
CHEM 1300, CHEM 1310 (C+)	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2400, CHEM 2470, CHEM 2860 (CHEM 2360)	CHEM 3400, CHEM 3590	CHEM 4610 (6)
PHYS 1050 (or PHYS 1020 (C+)), PHYS 1070			
MATH 1500 ¹ , MATH 1700 ¹			
In Year 1 or Year 2 the following must be completed: 6 credit hours from the Faculty of Arts, which should include the required "W" course. 3 credit hours from Mathematics, Statistics or Computer Science courses ²		Sufficient credit hours (18) from the 2000, 3000 and 4000 level Chemistry ³ courses not yet taken to total a minimum of 57 credit hours of Chemistry courses at the 1000-4000 Level. These credit hours may make up part of a focus area. 9 credit hours of non-Chemistry courses ⁶ which are part of a designated focus area ³ . (Note: If no Focus Area is selected, students must choose 9 credit hours of Chemistry courses.)	
		Work Terms (if Co-op selected): CHEM 3980, CHEM 3990	Work Terms (if Co-op selected): CHEM 4980 and/or CHEM 4990
30 Hours	30 Hours	30 Hours	30 Hours

1. **MATH 1230** or MATH 1510 or MATH 1520 may be taken in place of MATH 1500; **MATH 1232** or MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.

2. MATH 1010, MATH 1020, MATH 1190, MATH 1191, COMP 1260 and COMP 1270 may not be used to satisfy this requirement.

3. Students may elect to complete the requirements set out in one of the Chemistry focus areas. If a student opts for one of the focus areas, they should consult with the Department of Chemistry and a Science Academic Advisor for information regarding specific course requirements for each focus area.

4. **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.

5. Elective courses should be selected in consultation with the Department of Chemistry and/or a Faculty of Science Academic Advisor.

6. **Not all Focus Areas include non-Chemistry courses. Some Focus Areas are all Chemistry courses. Refer to the description of each Focus Area for more information.**

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Summary:

1. Add the newly proposed Math courses as suitable options in the footnotes to the program chart.
2. Delete a statement about PHYS 1030 related to the General degree, which resulted in a renumbering of the footnotes.
3. Add a footnote about the content of Focus Areas.

Rationale:

1. The newly proposed Math courses are suitable options for students in the Chemistry Major program.
2. The statement regarding PHYS 1030 as it relates to the General degree does not belong in this portion of the chart.
3. The footnote about the Focus Areas is to provide students with the information that not all Focus Areas include non-Chemistry courses.

Program modifications:

Modifications to the follow programs are outlined on the next pages:

- **Bachelor of Science (General) in Chemistry**
- **Minor in Chemistry**

Proposed Changes to General Degree and Minor Requirements:

Current Chemistry General Degree and Minor Requirements:

Three Year Requirements

Courses taken as part of a three-year degree program provide an introduction to the major fields of study in Chemistry. Commencing in Fall Term 2010, students will have two options for a three year Degree under the Department of Chemistry.

Option A – Three Year General: As prescribed with all other faculty regulations in Section 3.2, students in this program must select 18 credit hours of 2000, 3000, and (or) 4000 level courses from each of **two** Science areas. To satisfy the requirement in the area of Chemistry, students must select a minimum of 18 credit hours from the following list of advanced level courses: CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2360, CHEM 2370, CHEM 2400 (CHEM 2380), CHEM 2470, CHEM 3360, CHEM 3370, CHEM 3390, CHEM 3400 (CHEM 3380), CHEM 3570, CHEM 3580, CHEM 3590, CHEM 4360, CHEM 4370, CHEM 4570, CHEM 4580, CHEM 4590, CHEM 4620, CHEM 4630, CHEM 4640, CHEM 4660, CHEM 4670, CHEM 4680, CHEM 4690 (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).

Courses **not allowed** for use as advanced level courses in the 3-Year General Degree are: CHEM 2240, CHEM 2550, CHEM 2560, CHEM 2770, CHEM 2780, CHEM 2860, CHEM 4550, ~~CHEM 4600~~, CHEM 4650, CHEM 4700, and CHEM 4710.

Option B - Three Year B.Sc. – Chemistry Focus: Students that choose this path for their three-year degree program will follow the program chart below. The 24 credit hours of introductory courses and 36 credit hours of advanced level requirements have been prescribed in such a way so that students that follow the chart can seamlessly transfer to a 4-year Chemistry Honours or Major degree program should they choose to do so after the completion of the 90 credit hours listed in the chart.

Students anticipating a transfer to either the four year Major or Honours program at the end of their second or third year should consult with the Departmental Program Advisor before registering.

THREE YEAR B.Sc. General – Chemistry Focus 90 CREDIT HOURS	
CHEM 1300, CHEM 1310 (C)	21 hours of required 2000 level Chemistry courses: CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2400 (CHEM 2380), CHEM 2470, CHEM 2360
BIOL 1020, BIOL 1030	15 credit hours of 2000 level or higher CHEM: Excluding the Chemistry service courses (2240, 2560, 2770, 2780), Co-op courses (3980, 3990, 4980, 4990) and specialized courses (4600 , 4700, 4710). A minimum of 6 credit hours must be chosen from the 3000 / 4000 level.
MATH 1500 ¹ , MATH 1700 ¹	6 credit hours of electives to be chosen from outside the Faculty of Science
PHYS 1050 ² , PHYS 1070 ²	18 credit hours of open electives
6 credit hours from the Faculty of Arts. (Should include the student's "W" requirement.)	

THREE YEAR GENERAL 90 CREDIT HOURS	
CHEM 1300, CHEM 1310 (C)	a minimum of 18 credit hours from the following list of advanced level courses: CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2360, CHEM 2370, CHEM 2400 (CHEM 2380), CHEM 2470, CHEM 3360, CHEM 3370, CHEM 3400 (CHEM 3380), CHEM 3390, CHEM 3570, CHEM 3580, CHEM 3590, CHEM 4360, CHEM 4370, CHEM 4570, CHEM 4580, CHEM 4590, CHEM 4620, CHEM 4630, CHEM 4640, CHEM 4660, CHEM 4670, CHEM 4680, CHEM 4690 (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).
MINOR	
CHEM 1300, CHEM 1310 (C)	Normally CHEM 2210 and CHEM 2220, plus an additional 6 credit hours of Chemistry

NOTES:

1. 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.

2. PHYS 1020 may be used in place of PHYS 1050; and, in the 3-year degree only - PHYS 1030 may be used in place of PHYS 1070. Students planning on completing a 4-year degree in Chemistry are required to complete PHYS 1070.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Chemistry General Degree and Minor Requirements:

Three Year Requirements

Courses taken as part of a three-year degree program provide an introduction to the major fields of study in Chemistry. Commencing in Fall Term 2010, students will have two options for a three year Degree under the Department of Chemistry.

Option A – Three Year General: As prescribed with all other faculty regulations in Section 3.2, students in this program must select 18 credit hours of 2000, 3000, and (or) 4000 level courses from each of **two** Science areas. To satisfy the requirement in the area of Chemistry, students must select a minimum of 18 credit hours from the following list of advanced level courses: CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2360, CHEM 2370, CHEM 2400 (CHEM 2380), CHEM 2470, CHEM 3360, CHEM 3370, CHEM 3390, CHEM 3400 (CHEM 3380), CHEM 3570, CHEM 3580, CHEM 3590, **CHEM 4100**, CHEM 4360, CHEM 4370, CHEM 4570, CHEM 4580, CHEM 4590, CHEM 4620, CHEM 4630, CHEM 4640, CHEM 4660, CHEM 4670, CHEM 4680, CHEM 4690 (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).

Courses **not allowed** for use as advanced level courses in the 3-Year General Degree are: CHEM 2240, CHEM 2550, CHEM 2560, CHEM 2770, CHEM 2780, CHEM 2860, CHEM 4550, **(the former CHEM 4600)**, **CHEM 4610(6)**, CHEM 4650, CHEM 4700, and CHEM 4710.

Option B - Three Year B.Sc. – Chemistry Focus: Students that choose this path for their three-year degree program will follow the program chart below. The 24 credit hours of introductory courses and 36 credit hours of advanced level requirements have been prescribed in such a way so that students that follow the chart can seamlessly transfer to a 4-year Chemistry Honours or Major degree program should they choose to do so after the completion of the 90 credit hours listed in the chart.

Students anticipating a transfer to either the four year Major or Honours program at the end of their second or third year should consult with the Departmental Program Advisor before registering.

THREE YEAR B.Sc. General – Chemistry Focus 90 CREDIT HOURS	
CHEM 1300, CHEM 1310 (C)	21 hours of required 2000 level Chemistry courses: CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2400 (CHEM 2380), CHEM 2470, CHEM 2360
BIOL 1020, BIOL 1030	15 credit hours of 2000 level or higher CHEM: Excluding the Chemistry service courses (2240, 2560, 2770, 2780), Co-op courses (3980, 3990, 4980, 4990) and specialized courses (4610 , 4700, 4710). A minimum of 6 credit hours must be chosen from the 3000 / 4000 level.
MATH 1500 ¹ , MATH 1700 ¹	6 credit hours of electives to be chosen from outside the Faculty of Science
PHYS 1050 ² , PHYS 1070 ²	18 credit hours of open electives
6 credit hours from the Faculty of Arts. (Should include the student's "W" requirement.)	
THREE YEAR GENERAL 90 CREDIT HOURS	
CHEM 1300, CHEM 1310 (C)	a minimum of 18 credit hours from the following list of advanced level courses: CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2360, CHEM 2370, CHEM 2400 (CHEM 2380), CHEM 2470, CHEM 3360, CHEM 3370, CHEM 3400 (CHEM 3380), CHEM 3390, CHEM 3570, CHEM 3580, CHEM 3590, CHEM 4100 , CHEM 4360, CHEM 4370, CHEM 4570, CHEM 4580, CHEM 4590, CHEM 4620, CHEM 4630, CHEM 4640, CHEM 4660, CHEM 4670, CHEM 4680, CHEM 4690 (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).
MINOR	
CHEM 1300, CHEM 1310 (C)	Normally CHEM 2210 and CHEM 2220, plus an additional 6 credit hours of Chemistry

NOTES:

1. **MATH 1230** or MATH 1510 or MATH 1520 may be taken in place of MATH 1500; **MATH 1232** or MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.

2. PHYS 1020 may be used in place of PHYS 1050; and, in the 3-year degree only - PHYS 1030 may be used in place of PHYS 1070. Students planning on completing a 4-year degree in Chemistry are required to complete PHYS 1070.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Summary:

1. Add the newly proposed Math courses as suitable options in the footnotes to the program chart.
2. Add the new CHEM 4100 to the list of optional advanced level courses in Chemistry.
3. Remove CHEM 4600 and add CHEM 4610 to the program chart section, which indicates courses that are not suitable as part of the advanced level courses in Chemistry.
4. In the section "courses not allowed for use as advanced level courses in the 3-Year General Degree" add the information that CHEM 4600 is the former CHEM 4600 and add CHEM 4610 to the list.

Rationale:

1. The newly proposed Math courses are suitable options for students pursuing the General degree.
2. CHEM 4100 is an appropriate course for students to choose as an advanced level course in Chemistry.
- 3 & 4. CHEM 4600 a 3-credit hour course, Advanced Chemical Techniques, was recently deleted and replaced with CHEM 4610, 6-credit hour course, Advanced Chemical Techniques.

Program modification:

Modifications to the **Physical Chemistry Focus Area** are detailed on the next page:

**CHEMISTRY
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Physical Chemistry Focus Area

Current Calendar Entry:

Physical: Each of: CHEM 3360, CHEM 3370, CHEM 3490, ~~CHEM 4640, CHEM 4650, CHEM 4660~~; plus 9 credit hours from: ~~MATH 2750 (6), MATH 2800,~~ PHYS 2390, PHYS 2490, PHYS 2600, PHYS 2610, PHYS 3680. (MATH 1300 is highly recommended but ~~does~~ not count toward the 9 credit hour of non-Chemistry requirements).

Proposed Calendar Entry:

Physical: **18 credit hours from:** CHEM 3360, CHEM 3370, CHEM 3490, **CHEM 3570, CHEM 3580, CHEM 4100, CHEM 4660, CHEM 4800 (Topics in Physical/Theoretical Chemistry)**; plus 9 credit hours from: **MATH 2090, PHYS 2260**, PHYS 2390, PHYS 2490, PHYS 2600, PHYS 2610, PHYS 3680. (**MATH 1220 or MATH 1300** are highly recommended but **will** not count toward the 9 credit hours of non-Chemistry requirements).

Summary & Rationale:

1. Two optional courses were removed from the Chemistry course list, CHEM 4640 and CHEM 4650, as they are not regularly offered.
2. Four additional optional courses were added to the Chemistry course list, CHEM 3570 (Biophysical Chemistry), CHEM 3580 (Physical Organic Chemistry) CHEM 4100 (Materials Chemistry) and CHEM 4800 (Topics in Physical/Theoretical Chemistry) all of which have been introduced since the focus area was implemented.
3. An additional option has been added to the Non-Chemistry courses, PHYS 2260 (Optics).
4. Courses being deleted as a result of the Math program revisions have been deleted and an optional replacement has been added.

Program modification:

Modifications to the **Bachelor of Science (Joint Honours) in Chemistry and Physics and Astronomy** are outlined on the next pages.

**CHEMISTRY – PHYSICS & ASTRONOMY JOINT HONOURS PROGRAM
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Proposed Changes to the B.Sc. Joint Honours Degree in Chemistry – Physics & Astronomy

Current Program Requirements:

4.5.5 Chemistry - Physics Joint Honours Program			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS² 120 CREDIT HOURS			
CHEM 1300 (B), CHEM 1310(B) PHYS 1050 (B) (or PHYS 1020(B+)), PHYS 1070 (B) MATH 1500 ¹ (B), MATH 1700 ¹ (B) 6 credit hours from the Faculty of Arts, which should include the required "W" course 6 credit hours of electives	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2400 or CHEM 2470 PHYS 2390, PHYS 2380, PHYS 2490, PHYS 2600, PHYS 2650	12 credit hours from whichever of CHEM 2400 or 2470 not taken and any of CHEM 2860(CHEM 2360 /MBIO 2360),CHEM 2370 (MBIO 2370) or 3000 / 4000 level Chemistry courses PHYS 2260, PHYS 2610, PHYS 3380, PHYS 3630, PHYS 3670, PHYS 3680	CHEM 4600 CHEM 4710 (6) or both PHYS 4672 and PHYS 4674 PHYS 4390 6 credit hours of 3000 / 4000 level Physics courses 3 credit hours of 3000 / 4000 level Chemistry courses 9-credit hours of approved electives ³
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1. 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.

2. PHYS 1020 may be used in place of PHYS 1050; and, ~~in the 3-year degree only – PHYS 1030 may be used in place of PHYS 1070. Students planning on completing a 4-year degree in Chemistry are required to complete PHYS 4070.~~

3. Elective courses should be selected in consultation with the Department of Chemistry and/or a Faculty of Science Academic Advisor.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Program Requirements:

4.5.5 Chemistry - Physics Joint Honours Program			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS² 120 CREDIT HOURS			
CHEM 1300 (B), CHEM 1310(B) PHYS 1050 (B) (or PHYS 1020(B+) ²), PHYS 1070 ² (B) MATH 1500 ¹ (B), MATH 1700 ¹ (B) 6 credit hours from the Faculty of Arts, which should include the required "W" course 6 credit hours of electives	CHEM 2210, CHEM 2220, CHEM 2280, CHEM 2290, CHEM 2400 or CHEM 2470 PHYS 2390, PHYS 2380, PHYS 2490, PHYS 2600, PHYS 2650	12 credit hours from whichever of CHEM 2400 or 2470 not taken and any of CHEM 2860(CHEM 2360 /MBIO 2360),CHEM 2370 (MBIO 2370) or 3000 / 4000 level Chemistry courses PHYS 2260, PHYS 2610, PHYS 3380, PHYS 3630, PHYS 3670, PHYS 3680	CHEM 4610 (6) CHEM 4710 (6) or both PHYS 4672 and PHYS 4674 PHYS 4390 6 credit hours of 3000 / 4000 level Physics courses 3 credit hours of 3000 / 4000 level Chemistry courses 6 credit hours of approved electives
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1. **MATH 1230** or MATH 1510 or MATH 1520 may be taken in place of MATH 1500; **MATH 1232** or MATH 1710 may be taken in place of MATH 1700 ; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.

2. PHYS 1020 may be used in place of PHYS 1050; **PHYS 1070 is required in the Chemistry and Physics Joint Honours.**

3. Elective courses should be selected in consultation with the Department of Chemistry and/or a Faculty of Science Academic Advisor.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Summary of Changes:

1. Delete CHEM 4600 and replace with the 6 credit hour CHEM 4610 and a decrease in the number of electives in year 4 from 9 to 6.
2. Add the newly proposed Math courses as suitable options in the footnotes to the program chart.
3. Delete a statement about PHYS 1030 related to the General degree.

Computer Science

Modifications:

COMP 1012 Computer Programming for Scientists and Engineers Cr.Hrs. 3 0.0

(Lab Required) An introduction to computer programming suitable for solving problems in science and engineering. Students will implement algorithms for numerical processing, statistical analysis and matrix operations. Not to be held with COMP 1010, COMP 1011 or COMP 1013. Prerequisite: Mathematics 40S or equivalent. Corequisite: MATH 1230 or MATH 1500 or MATH 1501 (or equivalent).

COMP 1020 Introductory Computer Science 2 Cr.Hrs. 3 0.0

(Lab Required) More features of a procedural language, elements of programming. Not to be held with COMP 1021. Prerequisite: COMP 1010 or COMP 1011 (074.101) (C); or COMP 1012 or COMP 1013 (C) or High School Computer Science 40S (75%) and any grade 12 or 40S Mathematics, or equivalent.

COMP 2130 Discrete Mathematics for Computer Science Cr.Hrs. 3 0.0

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" in one of MATH 1210, MATH 1211, MATH 1220, MATH 1300, MATH 1301 (136.130), MATH 1310 (136.131); and in one of: MATH 1230, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), MATH 1520 (136.152), the former 136.153, or MATH 1690 (136.169).

COMP 2190 Introduction to Scientific Computing Cr.Hrs. 3 0.0

An applied computational course introducing topics such as approximation by polynomials, solution of non-linear equations, linear systems, simulation and computational geometry. Not to be held with COMP 2191. Prerequisites: One of COMP 1020 or COMP 1021 (074.102), or COMP 1012 or COMP 1013 (C); and one of MATH 1230, MATH 1500, MATH 1501 (136.150) (C), MATH 1510 (136.151) (C), MATH 1520 (136.152) (C), the former 136.153 (C), or MATH 1690 (136.169) (C). Prerequisite or corequisite: One of MATH 1220, MATH 1300, MATH 1301, or MATH 1310.

COMP 3490 Computer Graphics 1 Cr.Hrs. 3 0.0

An introductory course in computer graphics including topics such as raster graphics, two and three dimensional transforms, and simple rendering. Prerequisite: COMP 2140 (C); and either COMP 2190 (C), or a C in both: MATH 1300 (or MATH 1220, MATH 1310, MATH 1301, MATH 1210 or MATH 1211) and MATH 1500 (or MATH 1230, MATH 1501, MATH 1510 or MATH 1520).

NET CHANGE IN CREDIT HOURS: 0.0

Program modifications:

Modifications to the following programs are detailed on the next pages:

- **Bachelor of Science (Honours) in Computer Science**
- **Bachelor of Science (Honours) in Computer Science, Cooperative Option**
- **Bachelor of Science (Major) in Computer Science**
- **Bachelor of Science (Major) in Computer Science, Cooperative Option**

**COMPUTER SCIENCE
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

**Proposed Changes to the B.C.Sc. Honours and the B.Sc. Major Degree in
Computer Science including Co-op programs**

Computer Science Programs as approved by Senate, December 2014:

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS^{2,3,4,5} (Including Cooperative Option if selected)² 120 CREDIT HOURS			
COMP 1010, COMP 1020 (B) MATH 1300(C) ¹ and MATH 1500(C) ¹	COMP 2080, COMP 2130 ¹ , COMP 2140, COMP 2150, COMP 2160, COMP 2280	COMP 3030, COMP 3170, COMP 3350, COMP 3370, COMP 3430	COMP 4620 and 21 credit hours of 4000 level Computer Science courses
In Year 1 and / or Year 2 the following must be completed: STAT 1000 (C) 6 credit hours from the Faculty of Arts, which should include the required 3 credit hour "W" course. 21 credit hours of approved elective courses ^{3,4}		21 credit hours of approved electives ^{3,5} Work Terms (if Co-op Selected): COMP 2980, COMP 3980, COMP 4980 must be completed prior to the last academic term	
FOUR YEAR MAJOR^{2,3,4,5} (Including Cooperative Option if Selected)² 120 CREDIT HOURS			
COMP 1010, COMP 1020 (C+) MATH 1300(C) ¹ and MATH 1500(C) ¹	COMP 2080, COMP 2130 ¹ , COMP 2140, COMP 2150, COMP 2160, COMP 2280	COMP 3350, COMP 3370, COMP 3430, COMP 4620 18 credit hours of 3000 or 4000 level Computer Science courses of which 6 credit hours must be at the 4000 level	
In Year 1 or Year 2 the following must be completed: STAT 1000 (C) 6 credit hours from the Faculty of Arts, which should include the required 3 credit hour "W" course. 21 credit hours of approved electives ^{4,6}		30 credit hours of approved electives ^{3,5} Work Terms (if Co-op Selected): COMP 2980, COMP 3980, COMP 4980 must be completed prior to the last academic term	
NOTES: 1 MATH 1210 or MATH 1211 or MATH 1310 may be taken in place of MATH 1300; MATH 1510, MATH 1520, or MATH 1690 (6) may be taken in place of MATH 1500. A grade of "C" is required in each of the two 3-credit hour courses of Mathematics used as prerequisite to COMP 2130. 2 Entry to the Honours Cooperative Option and four year Major Cooperative Option is at the end of second year. Employment terms follow 3A (September-December), 3B (May-August) and 4A (January-April). Students in the Cooperative Option must complete three employment terms and receive a passing grade in COMP 2980, COMP 3980 and COMP 4980 prior to the last academic term.			

3 Additional information on how students may select their courses can be found at the beginning of this section.

4 IMPORTANT: The four year Honours degree 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. Students in the Cooperative Option should be aware that while other arrangements are possible, they may jeopardize their chances of obtaining employment by selecting such arrangements. Students should discuss their planned sequence of courses with the department prior to making adjustments to the sequence above.

5 IMPORTANT: a maximum of 90 credit hours of computer science, statistics and mathematics courses can be included in a Major or Honours program.

Proposed Computer Science Programs:

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS ^{2,3,4,5} (Including Cooperative Option if selected) ² 120 CREDIT HOURS			
COMP 1010, COMP 1020 (B) MATH 1300(C) ¹ and MATH 1500(C) ¹	COMP 2080, COMP 2130 ¹ , COMP 2140, COMP 2150, COMP 2160, COMP 2280	COMP 3030, COMP 3170, COMP 3350, COMP 3370, COMP 3430	COMP 4620 and 21 credit hours of 4000 level Computer Science courses
In Year 1 and / or Year 2 the following must be completed: STAT 1000 (C) 6 credit hours from the Faculty of Arts, which should include the required 3 credit hour "W" course. 21 credit hours of approved elective courses ^{3,4}		21 credit hours of approved electives ^{3,5} Work Terms (if Co-op Selected): COMP 2980, COMP 3980, COMP 4980 must be completed prior to the last academic term	
FOUR YEAR MAJOR ^{2,3,4,5} (Including Cooperative Option if Selected) ² 120 CREDIT HOURS			
COMP 1010, COMP 1020 (C+) MATH 1300(C) ¹ and MATH 1500(C) ¹	COMP 2080, COMP 2130 ¹ , COMP 2140, COMP 2150, COMP 2160, COMP 2280	COMP 3350, COMP 3370, COMP 3430, COMP 4620 18 credit hours of 3000 or 4000 level Computer Science courses of which 6 credit hours must be at the 4000 level	
In Year 1 or Year 2 the following must be completed: STAT 1000 (C) 6 credit hours from the Faculty of Arts, which should include the required 3 credit hour "W" course. 21 credit hours of approved electives ^{4,6}		30 credit hours of approved electives ^{3,5} Work Terms (if Co-op Selected): COMP 2980, COMP 3980, COMP 4980 must be completed prior to the last academic term	
NOTES: 1 MATH 1210, MATH 1211, MATH 1220 or MATH 1310 may be taken in place of MATH 1300; MATH 1230 , MATH 1510, MATH 1520, or MATH 1690 (6) may be taken in place of MATH 1500. A grade of "C" or better is required in each of the two 3-credit hour courses of Mathematics used as prerequisite to COMP 2130. 2 Entry to the Honours Cooperative Option and four year Major Cooperative Option is at the end of second year. Employment terms follow 3A (September-December), 3B (May-August) and 4A (January-April). Students in the Cooperative Option must complete three employment terms and receive a passing grade in COMP 2980, COMP 3980 and COMP 4980 prior to the last academic term. 3 Additional information on how students may select their courses can be found at the beginning of this section. 4 IMPORTANT: The Honours and the four year Major degree need not be completed in the order 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. Students in the Cooperative Option should be aware that while other arrangements are possible, they may jeopardize their chances of obtaining employment by selecting such arrangements. Students should discuss their planned sequence of courses with the department prior to making adjustments to the sequence above.			

5 IMPORTANT: a maximum of 90 credit hours of computer science, statistics and mathematics courses can be included in a Major or Honours program.

Summary & Rationale:

1. Note 1: Update MATH course numberings in response to Math department undergraduate curriculum changes. Add clarification that a grade of C or better is required in both MATH 1300 and MATH 1500.
2. Note 4: add missing reference to the 4-Year Major program. Replace "manner" with "order".

Program modifications:

Modifications to the following programs are outlined on the next pages.

- **Bachelor of Science (Joint Honours) in Computer Science – Physics and Astronomy**
- **Bachelor of Science (Joint Honours) in Computer Science – Physics and Astronomy, Cooperative Option**

**COMPUTER SCIENCE – PHYSICS & ASTRONOMY JOINT HONOURS PROGRAM
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Proposed Changes to the B.Sc. Joint Honours in Computer Science and Physics and Astronomy including Co-op program

Current Entry & Continuation Requirements:

To enter the Joint Honours Computer Science-Physics program, the student must have a minimum grade of "B" in each of PHYS 1050 (or "B+" in PHYS 1020), PHYS 1070, MATH 1300, MATH 1500, MATH 1700 (or any equivalent), COMP 1010 and COMP 1020. Students must complete a minimum of 9 credit hours per term in each Fall and Winter term.

Current Computer Science – Physics & Astronomy Joint Honours Program:

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS^{2,3,4,5} (Including Cooperative Option if selected)² 120 CREDIT HOURS			
PHYS 1050 (B) (or PHYS 1020 (B+)) and PHYS 1070 ¹ (B) COMP 1010, COMP 1020 (B) MATH 1300 ² (B), MATH 1500 ² (B), MATH 1700 ² (B) 6 credit hours from the Faculty of Arts, which must include the required 3 credit hour "W" course ³ 3 credit hours of electives	PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2650 COMP 2080, COMP 2130, COMP 2140, COMP 2160, COMP 2280 Work Term (if Co-op Selected): COMP 2980 ⁴	PHYS 2600, PHYS 2610, PHYS 3380, PHYS 3670, PHYS 3680 COMP 2190, COMP 3170, COMP 3430 6 credit hours of 3000 and / or 4000 level Computer Science courses Work Term (if Co-op Selected): COMP 3980 ⁴	15 credit hours of 3000 and 4000 level Honours Physics courses, with at least 6 credit hours at the 4000 level 12 credit hours of 3000 or 4000 level courses from Computer Science, with at least 9 credit hours at the 4000 level by the end of Year 4 3 credit hours of approved electives Work Term (if Co-op Selected): COMP 4980 ⁴
30 hours	30 hours	30 hours	30 hours

NOTES:

1 PHYS 1030 is not suitable for entry to the Honours ~~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.

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 1690 may be taken in place of MATH 1500 and MATH 1700.

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

4 When chosen, the Cooperative Option work terms (2980, 3980, 4980) will normally be completed during the Summer Terms following years 2, 3, and 4 respectively.

Proposed Computer Science – Physics & Astronomy Joint Honours Program:

Proposed Entry & Continuation Requirements

To enter the Joint Honours Computer Science – Physics and Astronomy program, the student must have a minimum grade of “B” in each of PHYS 1050 (or “B+” in PHYS 1020), PHYS 1070, MATH 1300, MATH 1500, MATH 1700 (or any equivalent), COMP 1010 and COMP 1020.

To continue in the Honours program, students must maintain a minimum **Degree** GPA of 3.00, complete a minimum of 9 credit hours during each Fall and Winter Term (**or equivalent for students in the Co-operative option**).

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS^{2,3,4,5} (Including Cooperative Option if selected)⁴ 120 CREDIT HOURS			
PHYS 1050 (B) (or PHYS 1020 (B+)) and PHYS 1070 ¹ (B) COMP 1010, COMP 1020 (B)	PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2650	PHYS 2600, PHYS 2610, PHYS 3380, PHYS 3670, PHYS 3680	15 credit hours of 3000 and 4000 level Honours Physics courses, with at least 6 credit hours at the 4000 level
MATH 1300 ² (B), MATH 1500 ² (B), MATH 1700 ² (B) 6 credit hours from the Faculty of Arts, which must include the required 3 credit hour “W” course ³ 3 credit hours of electives	COMP 2080, COMP 2130, COMP 2140, COMP 2160, COMP 2280	COMP 2190, COMP 3170, COMP 3430 6 credit hours of 3000 and / or 4000 level Computer Science courses	12 credit hours of 3000 or 4000 level courses from Computer Science, with at least 9 credit hours at the 4000 level by the end of Year 4 3 credit hours of approved electives
	Work Term (if Co-op Selected):	Work Term (if Co-op Selected):	Work Term (if Co-op Selected):
	COMP 2980 ⁴	COMP 3980 ⁴	COMP 4980 ⁴
30 hours	30 hours	30 hours	30 hours

NOTES:

1 PHYS 1030 is not suitable for entry to the Honours 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.

2 **MATH 1220** or **MATH 1310** may be taken in place of **MATH 1300**; **MATH 1230**, **MATH 1510** or **MATH 1520** may be taken in place of **MATH 1500**; **MATH 1232** or **MATH 1710** may be taken in place of **MATH 1700**; **MATH 1690** may be taken in place of **MATH 1500** and **MATH 1700**.

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

4 When chosen, the Cooperative Option work terms (2980, 3980, 4980) will normally be completed during the Summer Terms following years 2, 3, and 4 respectively.

Summary:

1. Split the entry and continuation requirements into two separate statements, as throughout the Faculty's section.
2. In the Continuation requirement section add a comment to add an explanation for Co-op students.
3. Note 2: Update MATH course numberings
4. Remove reference to 4-Year Major program

Rationale:

1. To differentiate between the entry and continuation requirements.
2. To reflect that it is not required for Co-op students to necessarily complete 9 credit hours each Fall & Winter Term, due to the completion of a Work Term (s).
3. Additional new Math courses in response to Math department undergraduate curriculum changes.
4. Information does not apply to this program.

Program modification:

Modifications to the following programs are outlined on the next pages.

- **Bachelor of Science (Joint Honours) in Computer Science – Statistics**
- **Bachelor of Science (Joint Honours) in Computer Science – Statistics, Cooperative Option**

**COMPUTER SCIENCE – STATISTICS JOINT HONOURS PROGRAM
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

**Proposed Changes to the B.Sc. Joint Honours in Computer Science and Statistics
including Co-op program**

Current Computer Science - Statistics Joint Honours Program:

The Departments of Computer Science and Statistics offer a joint Honours program for in-depth study in both Computer Science and Statistics.

To enter the Joint Honours Computer Science-Statistics Program, the student must have a "B" or better in COMP 1020 and in STAT 2400 and a "C+" or better in ~~MATH 1300, MATH 1500 and MATH 1700 or any equivalent courses.~~

To graduate with the Honours degree a student must present a minimum grade of "C" in each course that contributes to the degree. In addition, the student must achieve a minimum DGPA of 3.00 and a minimum ~~grad~~ of "C+" in each of the program specific courses in Statistics.

Both departments must approve a student's Honours program each session. Students must also obtain approval from both departments for any and all revisions to the program.

Computer Science - Statistics Joint Honours Program			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS² 120 credit hours (comprising courses listed in chart below, and electives)			
MATH 1300¹ (C+), MATH 1500¹ (C+) MATH 1700¹ (C+) COMP 1010, COMP 1020 (B) STAT 1000, STAT 2000 (B) Plus 6 credit hours from the Faculty of Arts, which must include the required 3 credit hour "W" course plus 3 credit hours of electives.	COMP 2080, COMP 2130, COMP 2140, COMP 2150, COMP 2160, COMP 2190 STAT 2400 MATH 2300, MATH 2720, MATH 2730	COMP 3170, COMP 3380 STAT 3050, STAT 3400, STAT 3470, STAT 3480, STAT 3800 9 credit hours of electives ⁴ including 3 credit hours from 3rd year COMP	STAT 4100, STAT 4520, STAT 4530 21 credit hours of electives including 6 credit hours from 4th year COMP ³ , 3 credit hours from 3rd year COMP and 6 credit hours from 4th year STAT courses
30 Hours	30 Hours	30 Hours	30 Hours
JOINT HONOURS COOPERATIVE OPTION² 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
MATH 1300¹ (C+), MATH 1500¹ (C+), MATH 1700¹ (C+) COMP 1010, COMP 1020(B) STAT 1000, STAT 2000 (B) Plus 6 credit hours from the Faculty of Arts, which must	COMP 2080, COMP 2130, COMP 2140, COMP 2150, COMP 2160, COMP 2190, STAT 2400, MATH 2300, MATH 2720, MATH 2730	COMP 3170, COMP 3380 STAT 3050, STAT 3400, STAT 3470, STAT 3480, STAT 3800 9 credit hours of electives ⁴ including 3 credit hours from 3rd year COMP	STAT 4100, STAT 4520, STAT 4530 21 credit hours of electives including 6 credit hours from 4th year COMP ³ , 3 credit hours from 3rd year COMP and 6 credit hours

include the required 3 credit hour "W" course plus 3 credit hours of electives.			from 4th year STAT courses.
	COMP 2980 ⁶	COMP 3980 ⁶	COMP 4980 ⁶
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1 MATH 1310 may be taken in place of MATH 1300; math 1510, MATH 1520 may be taken in place of MATH 1500. MATH 1690 may be taken in place of the combination of MATH 1500 and MATH 1700. MATH 1710 may be taken in place of MATH 1700.

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

3 COMP 4710 and COMP 4380 are suggested if offered.

4. The following courses are suggested: COMP 3350, COMP 3020, COMP 3490, STAT 3490, STAT 4630, STAT 4690.

5 The work terms COMP 2980, COMP 3980 and COMP 4980 will be completed in the summers following Year 2, Year 3 and Year 4, respectively and must be completed by the last academic term.

Proposed Computer Science - Statistics Joint Honours Program:

The Departments of Computer Science and Statistics offer a joint Honours program for in-depth study in both Computer Science and Statistics.

To enter the Joint Honours Computer Science-Statistics Program, the student must have a "B" or better in COMP 1020 and in STAT 2400 and a "C+" or better in MATH 1220¹, MATH 1230¹ and MATH 1232¹. **Note that MATH 1240 is not required to enter the program, however, it is recommended that it be completed in Year 1 as it is prerequisite to a Year 2 course.**

To graduate with the Honours degree a student must present a minimum grade of "C" in each course that contributes to the degree. In addition, the student must achieve a minimum DGPA of 3.00 and a minimum grade of "C+" in each of the program specific courses in Statistics.

Both departments must approve a student's Honours program each session. Students must also obtain approval from both departments for any and all revisions to the program.

Computer Science - Statistics Joint Honours Program			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 credit hours (comprising courses listed in chart below, and electives)			
COMP 1010, COMP 1020 (B) STAT 1000, STAT 2000 (B) MATH 1220¹ (C+), MATH 1230¹ (C+) MATH 1232¹ (C+), MATH 1240 (C+) Plus 6 credit hours from the Faculty of Arts, which could include the required 3 credit hour "W" course.	COMP 2080 ² , COMP 2140, COMP 2150, COMP 2160, COMP 2190 STAT 2400 MATH 2080, MATH 2150 6 credit hours of electives.	COMP 3170, COMP 3380 STAT 3050, STAT 3400, STAT 3470, STAT 3480, STAT 3800 9 credit hours of electives ⁴ including 3 credit hours from 3rd year COMP.	STAT 4100, STAT 4520, STAT 4530 21 credit hours of electives including 6 credit hours from 4th year COMP ³ , 3 credit hours from 3rd year COMP and 6 credit hours from 4th year STAT courses.
30 Hours	30 Hours	30 Hours	30 Hours

JOINT HONOURS COOPERATIVE OPTION³ 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
COMP 1010, COMP 1020(B) STAT 1000, STAT 2000 (B) MATH 1220¹ (C+), MATH 1230¹ (C+), MATH 1232¹ (C+), MATH 1240 (C+) Plus 6 credit hours from the Faculty of Arts, which could include the required 3 credit hour "W" course.	COMP 2080 ² , COMP 2140, COMP 2150, COMP 2160, COMP 2190, STAT 2400, MATH 2080, MATH 2150 6 credit hours of electives.	COMP 3170, COMP 3380 STAT 3050, STAT 3400, STAT 3470, STAT 3480, STAT 3800 9 credit hours of electives ⁴ including 3 credit hours from 3rd year COMP.	STAT 4100, STAT 4520, STAT 4530 21 credit hours of electives including 6 credit hours from 4th year COMP ³ , 3 credit hours from 3rd year COMP and 6 credit hours from 4th year STAT courses.
	COMP 2980 ⁵	COMP 3980 ⁵	COMP 4980 ⁵
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1 MATH 1510 (B) or MATH 1500 (B) may be taken in place of MATH 1230; MATH 1300 (B) may be taken in place of MATH 1220; MATH 1710 (B) or MATH 1700 (B) may be taken in place of MATH 1232.

2 COMP 2130 is waived as a prerequisite for students in this program.

3 COMP 4710 and COMP 4380 are suggested if offered.

4 The following courses are suggested: COMP 3350, COMP 3020, COMP 3490, STAT 3490, STAT 4630, STAT 4690.

5 The work terms COMP 2980, COMP 3980 and COMP 4980 will be completed in the summers following Year 2, Year 3 and Year 4, respectively and must be completed by the last academic term.

Summary & Rationale:

The proposed program reflects the recent undergraduate curriculum revision of the Department of Mathematics. The Department of Mathematics introduced 47 new courses, and deleted most of the existing courses. Although they have renumbered most of the courses, the contents of many courses are changed. We have carefully reviewed the contents of all the courses and replaced the existing MATH courses (strike marked) by the proposed new courses (in bold) according to different years in the program. We have also indicated the substitutions of some of the required courses in the Notes section.

Linear Algebra 2 (MATH 2300/MATH 2090) is no longer required by the Department of Statistics in the joint program. The necessary material from Linear Algebra is included in the new Linear Algebra 1 course (MATH 1220). MATH 2150 (Multivariate calculus) replaces MATH 2720. MATH 2080 and MATH 1240 are required as prerequisites to MATH 2150. The removal of COMP 2130 is justified by the addition of MATH 1240 to the requirements in the joint program. MATH 1240 is required as a prerequisite to MATH 2080. While COMP 2130 and MATH 1240 are not equivalent, the content is sufficient for students with the mathematical background provided in the joint program.

Footnote 2 was deleted as it seems redundant to include this statement in this program, given the large number of Math courses in the program. This resulted in the renumbering of other footnotes.

Genetics

Program modifications:

Modifications to the following programs are outlined on the next pages:

- **Bachelor of Science (Honours) in Genetics**
- **Bachelor of Science (Honours) in Genetics, Cooperative Option**
- **Bachelor of Science (Major) in Genetics**
- **Bachelor of Science (Major) in Genetics, Cooperative Option**

**GENETICS
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

**Proposed Changes to the B.Sc. Honours and Major Degree in Genetics including
Co-op programs**

Current B.Sc. Honours and Major Degrees in Genetics Program Chart:

4.8.2 Genetics			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS (Including Cooperative Option^{3,4,5} if selected) 120 CREDIT HOURS			
CHEM 1300, CHEM 1310	BIOL 2500, BIOL 2520	BIOL 3500	
BIOL 1020, BIOL 1030	CHEM 2210, CHEM 2220, CHEM 2360 (MBIO 2360), CHEM 2370 (MBIO 2370)	MBIO 3410	
STAT 1000		PLNT 3140	
MATH 1500 ¹	MBIO 1010, MBIO 2020	BGEN 3020 (6)	
One of: MATH 1200, MATH 1300 ¹ , or MATH 1700 ¹	STAT 2000	One of: ANTH 2240, ANTH 2560, ANTH 2860, or ANTH 2890	
		42 credit hours from list of optional courses (a minimum of 18 of these credit hours must be 4000 level)	
In Year 1 or Year 2:		Work Terms (if Co-op Selected)^{3,4,5}:	
3 credit hours from the Faculty of Arts		MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	
3 credit hour "W" course ²			
6 credit hours of electives			
30 Hours	30 Hours	30 Hours	30 Hours
YEAR 1	YEAR 2	YEAR 3	YEAR 4
MAJOR (Including Cooperative Option if selected)¹ 120 CREDIT HOURS			
CHEM 1300, CHEM 1310	BIOL 2500, BIOL 2520	BIOL 3500	
BIOL 1020, BIOL 1030	CHEM 2210, CHEM 2220, CHEM 2360 (MBIO 2360), CHEM 2370 (MBIO 2370)	MBIO 3410	
STAT 1000		PLNT 3140	
MATH 1500 ¹	MBIO 1010, MBIO 2020	BGEN 3020 (6)	
One of: MATH 1200, MATH 1300 ¹ , or MATH 1700 ¹	STAT 2000	One of: ANTH 2240, ANTH 2560, ANTH 2860, or ANTH 2890	

		<p>One of: ANTH 2240, ANTH 2560, ANTH 2860, or ANTH 2890</p> <p>33 credit hours from list of optional courses (a minimum of 15 of these credit hours must be 4000 level)</p> <p>9 credit hours of approved elective courses</p>
<p>In Year 1 or Year 2:</p> <p>3 credit hours from the Faculty of Arts</p> <p>3 credit hour "W" course²</p> <p>6 credit hours of electives</p>		<p>Work Terms (if Co-op Selected)^{3,4,5}:</p> <p>MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990</p>
<p>NOTES:</p> <p>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; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.</p> <p>2 As there are no electives in Year 2 of the program, students should complete the University written English requirement in Year 1. If not completed in Year 1, a "W" course must be completed prior to Year 3 in addition to the required Year 2 courses.</p> <p>3 Students that begin their first work term in May must take BGEN 3020 in Year 3, while students that begin their first work term in January must take BGEN 3020 in Year 4.</p> <p>4 IMPORTANT: Students in the cooperative program are advised to ensure that they are able to satisfy the prerequisites for all 3000 and 4000 level courses they plan to take.</p> <p>⁵ MBIO 4530 and BGEN 4010 are not available to students in the Cooperative Option.</p> <p>(The number 6 in brackets indicates a 6 credit hour course.)</p>		

The optional courses are:

Biological Sciences: BIOL 2410, BIOL 2420, ~~BIOL 2540~~, BIOL 3290, BIOL 3300, BIOL 3560, BIOL 4500, BIOL 4540, BIOL 4542, BIOL 4560

Chemistry: CHEM 2280, CHEM 2290, CHEM 4360, CHEM 4370, CHEM 4620, CHEM 4630

Microbiology: MBIO 3000, MBIO 3010, MBIO 3030, MBIO 3430, MBIO 3440, MBIO 3450, MBIO 3460, MBIO 4010, MBIO 4020², MBIO 4410, MBIO 4530¹ (6), MBIO 4540, MBIO 4670 (or the former MBIO 4570), MBIO 4672², MBIO 4600, MBIO 4610.

Forensic Science: FORS 2000 (satisfies the University "W" requirement)

Computer Science: COMP 1010, COMP 1020, COMP 1260, COMP 1270

Physics: PHYS 1020, PHYS 1030, PHYS 1050, PHYS 1070

Animal Science: ANSC 3500, ANSC 4280

Pharmacology: PHAC 4030, PHAC 4040

Plant Science: PLNT 2530, PLNT 3500, PLNT 3520, PLNT 4330, PLNT 4610

Human Genetics: BGEN 4010¹

By an appropriate selection of courses from this list, students can obtain particular program emphasis in either plant, human or molecular genetics.

All programs must contain a minimum of 18 credit hours of 4000 level courses as options in Years 3 and 4.

Other suitable optional courses may be arranged through consultation with the Genetics program committee.

NOTES:

¹ MBIO 4530 (6) and BGEN 4010 are project courses. A research project is chosen in consultation with the Microbiology department (MBIO 4530) or Biochemistry and Medical Genetics (BGEN 4010) and the Genetics program committee, and is supervised by a staff member. Only one of MBIO 4530 or BGEN 4010 may be elected in this program.

² MBIO 4020 and MBIO 4672 are not available options for students in the Genetics Honours Degree program.

Proposed B.Sc. Honours and Major Degrees in Genetics Program Chart:

4.8.2 Genetics			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS (Including Cooperative Option^{3,4,5} if selected) 120 CREDIT HOURS			
CHEM 1300, CHEM 1310	BIOL 2500, BIOL 2520	BIOL 3500	
BIOL 1020, BIOL 1030	CHEM 2210, CHEM 2220, CHEM 2360 (MBIO 2360), CHEM 2370 (MBIO 2370)	MBIO 3410	
STAT 1000		PLNT 3140	
MATH 1500 ¹	MBIO 1010, MBIO 2020	BGEN 3020 (6)	
One of: MATH 1200 ¹ , MATH 1300 ¹ , or MATH 1700 ¹	STAT 2000	One of: ANTH 2240, ANTH 2560, ANTH 2860, or ANTH 2890	
		42 credit hours from list of optional courses (a minimum of 18 of these credit hours must be 4000 level)	
In Year 1 or Year 2:		Work Terms (if Co-op Selected)^{3,4,5}:	
3 credit hours from the Faculty of Arts		MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	
3 credit hour "W" course ²			
6 credit hours of electives			
30 Hours	30 Hours	30 Hours	30 Hours
YEAR 1	YEAR 2	YEAR 3	YEAR 4
MAJOR (Including Cooperative Option if selected)^{3,4,5} 120 CREDIT HOURS			
CHEM 1300, CHEM 1310	BIOL 2500, BIOL 2520	BIOL 3500	
BIOL 1020, BIOL 1030	CHEM 2210, CHEM 2220, CHEM 2360 (MBIO 2360), CHEM 2370 (MBIO 2370)	MBIO 3410	
STAT 1000		PLNT 3140	
MATH 1500 ¹	MBIO 1010, MBIO 2020	BGEN 3020 (6)	
One of: MATH 1200 ¹ , MATH 1300 ¹ , or MATH 1700 ¹	STAT 2000	One of: ANTH 2240, ANTH 2560, ANTH 2860, or ANTH 2890	
		33 credit hours from list of optional courses (a minimum of 15 of these credit hours must be 4000 level)	
		9 credit hours of approved elective courses	
In Year 1 or Year 2:		Work Terms (if Co-op Selected)^{3,4,5}:	
3 credit hours from the Faculty of Arts		MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	

3 credit hour "W" course ²	
6 credit hours of electives	

NOTES:

¹ **MATH 1220** or MATH 1310 may be taken in place of MATH 1300; **MATH 1230**, MATH 1510, or MATH 1520 may be taken in place of MATH 1500; **MATH 1232** or MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700; **MATH 1240 may be taken in place of MATH 1200.**

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

³ Students that begin their first work term in May must take BGEN 3020 in Year 3, while students that begin their first work term in January must take BGEN 3020 in Year 4.

⁴ **IMPORTANT:** Students in the cooperative program are advised to ensure that they are able to satisfy the prerequisites for all 3000 and 4000 level courses they plan to take.

⁵ MBIO 4530 and BGEN 4010 are not available to students in the Cooperative Option.

(The number 6 in brackets indicates a 6 credit hour course.)

The optional courses are:

Biological Sciences: BIOL 2410, BIOL 2420, BIOL 3290, BIOL 3300, **BIOL 3542**, BIOL 3560, BIOL 4500, BIOL 4540, BIOL 4542, BIOL 4560

Chemistry: CHEM 2280, CHEM 2290, CHEM 4360, CHEM 4370, CHEM 4620, CHEM 4630

Microbiology: MBIO 3000, MBIO 3010, MBIO 3030, MBIO 3430, MBIO 3440, MBIO 3450, MBIO 3460, MBIO 4010, MBIO 4020⁴, MBIO 4410, MBIO 4530¹ (6), MBIO 4540, MBIO 4670 (or the former MBIO 4570), MBIO 4672², MBIO 4600, MBIO 4610.

Forensic Science: FORS 2000 (satisfies the University "W" requirement)

Computer Science: COMP 1010, COMP 1020, COMP 1260, COMP 1270

Physics: PHYS 1020, PHYS 1030, PHYS 1050, PHYS 1070

Animal Science: ANSC 3500, ANSC 4280

Pharmacology: PHAC 4030, PHAC 4040

Plant Science: PLNT 2530, PLNT 3500, PLNT 3520, PLNT 4330, PLNT 4610

Human Genetics: BGEN 4010¹

By an appropriate selection of courses from this list, students can obtain particular program emphasis in either plant, human or molecular genetics.

NOTES:

¹ MBIO 4530 (6) and BGEN 4010 (6) are project courses. A research project is chosen in consultation with the Microbiology department (MBIO 4530) or Biochemistry and Medical Genetics (BGEN 4010) and the Genetics program committee, and is supervised by a staff member. Only one of MBIO 4530 or BGEN 4010 may be elected in this program.

² MBIO 4020 and MBIO 4672 are not available options for students in the Genetics Honours Degree program.

Summary:

1. Add newly proposed Math courses as optional substitutions in the Notes section of the program chart.
2. Delete BIOL 2540 as a choice on the Option List and replaced with BIOL 3542.
3. Correct an error in the footnote on the Major Chart.
4. Add a (6) beside BGEN 4010.

Rationale:

1. The newly proposed Math courses are suitable options for students in the B.Sc. Honours or Major degree in Genetics.
2. BIOL 2540 was recently deleted from the curriculum and replaced with BIOL 3542.
3. The appropriate footnote notations were not attached to the Major chart.
4. BGEN 4010 is 6 credit hour course.

Microbiology

Program modifications

Modifications to the following programs are outlined on the next pages:

- **Bachelor of Science (Honours) in Microbiology**
- **Bachelor of Science (Honours) in Microbiology – Cooperative Option**
- **Bachelor of Science (Major) in Microbiology**
- **Bachelor of Science (Major) in Microbiology – Cooperative Option**

**MICROBIOLOGY
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

**Proposed Changes to the B.Sc. Honours and Major Degree in Microbiology
including Co-op Programs**

**B.Sc. Honours and Major Degree in Microbiology as approved by Senate
December 2014:**

4.10.2 Microbiology			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS⁶ 120 CREDIT HOURS			
MBIO 1010 ⁵ BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310	MBIO 2020, MBIO 2360(CHEM 2360), MBIO 2370(CHEM 2370) BIOL 2500, BIOL 2520 CHEM 2210, CHEM 2220	MBIO 3010, MBIO 3030, MBIO 3280, MBIO 3410, MBIO 3470	MBIO 4010, MBIO 4440, MBIO 4480, MBIO 4530 (6), MBIO 4600, MBIO 4610
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 STAT 1000 6 credit hours from the Faculty of Arts, which should include the required "W" course. 9 credit hours of approved electives 3 credit hours from Microbiology or from the option list		15 credit hours of Microbiology courses ³ 9 credit hours chosen from Microbiology courses ³ or from the option list (see below)	
30 Hours	30 Hours	30 Hours	30 Hours
HONOURS COOPERATIVE OPTION⁶ 120 CREDIT HOURS			
MBIO 1010 ⁵ BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310	MBIO 2020, MBIO 2360 (CHEM 2360), MBIO 2370 (CHEM 2370) BIOL 2500, BIOL 2520 CHEM 2210, CHEM 2220	MBIO 3010, MBIO 3030, MBIO 3280, MBIO 3410, MBIO 3470	MBIO 4010, MBIO 4440, MBIO 4480, MBIO 4600, MBIO 4610

In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics from MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 STAT 1000 6 credit hours from the Faculty of Arts, which should include the required "W" course 9 credit hours of approved electives 3 credit hours chosen from Microbiology courses ³ or from the option list (see below)		21 credit hours of Microbiology courses ³ 9 credit hours chosen from Microbiology courses ³ or from the option list (see below) Work Terms: MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	
30 Hours	30 Hours	30 Hours	30 Hours
FOUR –YEAR MAJOR (Including Co-op)^{4,6} 120 CREDIT HOURS			
MBIO 1010 ⁵ BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310	MBIO 2020, MBIO 2360 (CHEM 2360), MBIO 2370 (CHEM 2370) BIOL 2500, BIOL 2520 CHEM 2210, CHEM 2220	MBIO 3010, MBIO 3030, MBIO 3410	
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics from MATH 1200, MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 STAT 1000 6 credit hours from the Faculty of Arts, which should include the required "W" course. 12 credit hours of approved electives		24 credit hours of Microbiology courses ² including 15 credit hours at the 4000 level 9 credit hours of Microbiology courses ² or courses chosen from the option list (see below) 18 credit hours of approved electives Work Terms: MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	
THREE YEAR GENERAL (90 CREDIT HOURS)			
MBIO 1010	18 credit hours of 2000, 3000, and (or) 4000 level Microbiology courses (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level.)		
MINOR			
MBIO 1010 (C) CHEM 1300, CHEM 1310(C)	12 credit hours of Microbiology at the 2000 and (or) 3000 level		

BIOL 1020, BIOL
1030 (C)

BIOCHEMISTRY - Joint Microbiology and Chemistry Programs: See Section 4.2 Biochemistry

BIOTECHNOLOGY – Joint Microbiology and Chemistry Programs: See Section 4.4 Biotechnology

NOTES:

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.

² MBIO 4010, MBIO 4530 and MBIO 4670 may be selected only by special permission.

³ MBIO 4020 and MBIO 4762 cannot be selected.

⁴ 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.

⁵ MBIO 1010 may be completed in either year 1 or year 2. It is recommended that it be completed in first year.

⁶ MBIO 1220 and MBIO 2410 cannot be used to satisfy course requirements in a Major or Honours program.

(The number 6 in brackets indicates a 6 credit hour course.)

Option List for All Microbiology Programs:

Agroecology: AGEC 2370

Biological Sciences:

BIOL 2242 (BOTN 2010), BIOL 2260 (BOTN 2210), BIOL 2261, BIOL 2300 (BOTN 2370, ZOOL 2370), BIOL 2301 (BOTN 2371, ZOOL 2371), BIOL 2380 (BOTN 2180, ZOOL 2180), BIOL 2381, BIOL 2410 (ZOOL 2530), BIOL 2411 (ZOOL 2531), BIOL 2420 (ZOOL 2540), BIOL 2421 (ZOOL 2541), BIOL 3260 (BOTN 2290), BIOL 3290 (BOTN 3280), BIOL 3291, BIOL 3330 (BOTN 3250), BIOL 3370 (ZOOL 3500), BIOL 3400 (BIOL 3450), BIOL 3452 (BOTN 3010), BIOL 3460 (ZOOL 3530), BIOL 3462 (ZOOL 3540), BIOL 3470, BIOL 3472, BIOL 3500 (BOTN 3460), BIOL 3501, BIOL 3560 (ZOOL 3060), BIOL 3561, BIOL 4242 (BOTN 4130), BIOL 4244 (BOTN 4160), BIOL 4246 (BOTN 4050), BIOL 4250 (BOTN 4210), BIOL 4430 (BOTN 4120), BIOL 4480 (ZOOL 4600), BIOL 4540 (ZOOL 4150), BIOL 4542 (ZOOL 4270), BIOL 4554, BIOL 4556, BIOL 4560 (ZOOL 4140)

Chemistry:

CHEM 2280, CHEM 2290, CHEM 2380, CHEM 2400, CHEM 2470, CHEM 3390, CHEM 3590, CHEM 3570, CHEM 4590, CHEM 4360, CHEM 4370, CHEM 4620, CHEM 4630, CHEM 4670

Environmental Science: ENVR 2180

Food Sciences: FOOD 4150, FOOD 4280

General Agriculture: AGRI 2180

Pharmacology: PHAC 4030, PHAC 4040

Plant Science: PLNT 3400

Statistics: STAT 2000

NOTE: Other suitable options may be selected with permission of the department.

Proposed B.Sc. Honours and Major Degree in Microbiology including Co-op Programs:

4.10.2 Microbiology

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS⁶ 120 CREDIT HOURS			
MBIO 1010 ⁵ BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310	MBIO 2020, MBIO 2360(CHEM 2360), MBIO 2370(CHEM 2370) BIOL 2500, BIOL 2520 CHEM 2210, CHEM 2220	MBIO 3010, MBIO 3030, MBIO 3280, MBIO 3410, MBIO 3470	MBIO 4010, MBIO 4440, MBIO 4480, MBIO 4530 (6), MBIO 4600, MBIO 4610
In Year 1 or Year 2 the following must be completed: 3 credit hours of Mathematics or Physics chosen from: MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050 STAT 1000 6 credit hours from the Faculty of Arts, which should include the required "W" course. 9 credit hours of approved electives 3 credit hours from Microbiology or from the option list		15 credit hours of Microbiology courses ³ 9 credit hours chosen from Microbiology courses ³ or from the option list (see below)	
30 Hours	30 Hours	30 Hours	30 Hours
HONOURS COOPERATIVE OPTION⁶ 120 CREDIT HOURS			
MBIO 1010 ⁵ BIOL 1020, BIOL 1030 CHEM 1300, CHEM 1310	MBIO 2020, MBIO 2360 (CHEM 2360), MBIO 2370 (CHEM 2370) BIOL 2500, BIOL 2520 CHEM 2210, CHEM 2220	MBIO 3010, MBIO 3030, MBIO 3280, MBIO 3410, MBIO 3470	MBIO 4010, MBIO 4440, MBIO 4480, MBIO 4600, MBIO 4610

In Year 1 or Year 2 the following must be completed:		21 credit hours of Microbiology courses ³	
3 credit hours of Mathematics or Physics from MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		9 credit hours chosen from Microbiology courses ³ or from the option list (see below)	
STAT 1000		Work Terms:	
6 credit hours from the Faculty of Arts, which should include the required "W" course		MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	
9 credit hours of approved electives			
3 credit hours chosen from Microbiology courses ³ or from the option list (see below)			
30 Hours	30 Hours	30 Hours	30 Hours
FOUR –YEAR MAJOR (Including Co-op)^{4,6} 120 CREDIT HOURS			
MBIO 1010 ⁵	MBIO 2020, MBIO 2360 (CHEM 2360), MBIO 2370 (CHEM 2370)	MBIO 3010, MBIO 3030, MBIO 3410	
BIOL 1020, BIOL 1030			
CHEM 1300, CHEM 1310	BIOL 2500, BIOL 2520 CHEM 2210, CHEM 2220		
In Year 1 or Year 2 the following must be completed:		24 credit hours of Microbiology courses ² including 15 credit hours at the 4000 level	
3 credit hours of Mathematics or Physics from MATH 1200 ¹ , MATH 1300 ¹ , MATH 1500 ¹ , PHYS 1020 or PHYS 1050		9 credit hours of Microbiology courses ² or courses chosen from the option list (see below)	
STAT 1000		18 credit hours of approved electives	
6 credit hours from the Faculty of Arts, which should include the required "W" course.		Work Terms:	
12 credit hours of approved electives		MBIO 3980, MBIO 3990, MBIO 4980 and/or MBIO 4990	
THREE YEAR GENERAL (90 CREDIT HOURS)			
MBIO 1010	18 credit hours of 2000, 3000, and (or) 4000 level Microbiology courses (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level.)		
MINOR			
MBIO 1010 (C)	12 credit hours of Microbiology at the 2000 and (or) 3000 level		
CHEM 1300, CHEM 1310(C)			

BIOL 1020, BIOL 1030 (C)	
BIOCHEMISTRY - Joint Microbiology and Chemistry Programs: See Section 4.2 Biochemistry	
BIOTECHNOLOGY – Joint Microbiology and Chemistry Programs: See Section 4.4 Biotechnology	
NOTES:	
¹ MATH 1220 or MATH 1310 may be taken in place of MATH 1300; MATH 1230 , MATH 1510, MATH 1520 or MATH 1690 may be taken in place of MATH 1500; MATH 1240 may be taken in place of MATH 1200.	
² MBIO 4010, MBIO 4530 and MBIO 4670 may be selected only by special permission.	
³ MBIO 4020 and MBIO 4762 cannot be selected.	
⁴ 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.	
⁵ MBIO 1010 may be completed in either year 1 or year 2. It is recommended that it be completed in first year.	
⁶ MBIO 1220 and MBIO 2410 cannot be used to satisfy course requirements in a Major or Honours program.	
(The number 6 in brackets indicates a 6 credit hour course.)	
Option List for All Microbiology Programs:	
<i>Agroecology:</i> AGEC 2370	
<i>Biological Sciences:</i>	
BIOL 2242 (BOTN 2010), BIOL 2260 (BOTN 2210), BIOL 2261, BIOL 2300 (BOTN 2370, ZOOL 2370), BIOL 2301 (BOTN 2371, ZOOL 2371), BIOL 2380 (BOTN 2180, ZOOL 2180), BIOL 2381, BIOL 2410 (ZOOL 2530), BIOL 2411 (ZOOL 2531), BIOL 2420 (ZOOL 2540), BIOL 2421 (ZOOL 2541), BIOL 3260 (BOTN 2290), BIOL 3290 (BOTN 3280), BIOL 3291, BIOL 3330 (BOTN 3250), BIOL 3370 (ZOOL 3500), BIOL 3400 (BIOL 3450), BIOL 3452 (BOTN 3010), BIOL 3460 (ZOOL 3530), BIOL 3462 (ZOOL 3540), BIOL 3470, BIOL 3472, BIOL 3500 (BOTN 3460), BIOL 3501, BIOL 3542 (BIOL 2540) , BIOL 3560 (ZOOL 3060), BIOL 3561, BIOL 4242 (BOTN 4130), BIOL 4244 (BOTN 4160), BIOL 4246 (BOTN 4050), BIOL 4250 (BOTN 4210), BIOL 4430 (BOTN 4120), BIOL 4480 (ZOOL 4600), BIOL 4540 (ZOOL 4150), BIOL 4542 (ZOOL 4270), BIOL 4554, BIOL 4556, BIOL 4560 (ZOOL 4140)	
<i>Chemistry:</i>	
CHEM 2280, CHEM 2290, CHEM 2380, CHEM 2400, CHEM 2470, CHEM 3390, CHEM 3590, CHEM 3570, CHEM 4590, CHEM 4360, CHEM 4370, CHEM 4620, CHEM 4630, CHEM 4670	
<i>Environmental Science:</i> ENVR 2180	
<i>Food Sciences:</i> FOOD 4150, FOOD 4280	

General Agriculture: AGRI 2180

Pharmacology: PHAC 4030, PHAC 4040

Plant Science: PLNT 3400

Statistics: STAT 2000

NOTE: Other suitable options may be selected with permission of the department.

Summary:

1. Add newly proposed Math courses as options to the List 1 component of the degree.
2. Add BIOL 3542 to the option list.

Rationale:

1. The newly proposed Math courses are suitable options for students to complete for the List 1 component of the degree.
2. BIOL 2540, Developmental Biology, was recently deleted, and replaced with BIOL 3542, Developmental Biology. The former BIOL 2540 was previously on the option list and deleted, when the course was deleted. The new BIOL 3542 is a suitable course for the option list.

Physics and Astronomy

Modifications:

PHYS 1050 Physics 1: Mechanics Cr.Hrs. 3 0.0

(Lab required) It's rocket science! Mechanics is the science of describing (Kinematics) and explaining (Dynamics) motion. The basic concepts of calculus together with laws of conservation of momentum and energy are used to develop the tools required to describe, analyze and predict the outcomes of linear and rotational motion in simple mechanical systems. A brief introduction to the Einstein theory of special relativity provides a taste of modern approaches to this subject. This course develops a strong scientific foundation for students considering a program of study in engineering or the physical sciences. Not to be held with PHYS 1020, PHYS 1021 (016.102), PHYS 1051, PHYS 1410 (016.141), PHYS 1420 (016.142), or the former courses 016.118, 016.120, or 016.127. Prerequisites: Pre-calculus Mathematics 40S (300) (or equivalent) (60 percent) and Physics 40S (300) (or equivalent) (60 percent); or PHYS 0900 (016.090) (Pass). It is strongly recommended that students attain a minimum of 80 per cent as the average of their marks in Physics 40S (300) and Pre-calculus Mathematics 40S (300). Prerequisite or corequisite: One of MATH 1230, MATH 1500, MATH 1501, MATH 1510, MATH 1520, the former 136.153 or MATH 1690.

PHYS 1070 Physics 2: Waves and Modern Physics Cr.Hrs. 3 0.0

(Lab required) At the heart of modern communications, waves and oscillations are key to understanding the world around us from subatomic scales to biology, traffic flow, the stock market, climate change and the cosmos itself. Learn about the mysterious quantum world, the basis of the latest nanotechnology, where particles are waves and waves are particles. Explore Bohr's model of the atom and discover Heisenberg's Uncertainty Principle. This calculus based course addresses the underlying concepts for all modern science and engineering. This course, like Physics 1 (PHYS 1050), is intended for students considering a program in the physical sciences. Not to be held for credit with PHYS 1071, PHYS 1410 (016.141), PHYS 1420 (016.142). Prerequisites: PHYS 1050 (PHYS 1051, 016.105, 016.118) (C) or PHYS 1020 (PHYS 1021, 016.102) (B); and "C" or better in one of MATH 1230, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), MATH 1520 (136.152), or the former 136.153. Prerequisite or corequisite: one of MATH 1232, MATH 1700, MATH 1701, MATH 1690, MATH 1710, or the former 136.173.

PHYS 2152 Modern Physics for Engineers Cr.Hrs. 3 0.0

(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 or PHYS 1071 (016. 107). Prerequisites: a "C" or better in one of PHYS 1050, PHYS 1051 (016. 105), or the former 016.118; or a "B" or better in PHYS 1020 or PHYS 1021 (016.102); and a "C" or better in one of MATH 1230, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), MATH 1520 (136.152), or the former 136.153; and a "C" or better in one of MATH 1232, MATH 1700, MATH 1701 (136.170), MATH 1710 (136.171), the former 136.173, or MATH 1690 (136.169). Prerequisite or corequisite: MATH 2130.

PHYS 2210 Understanding Electricity and Magnetism Cr.Hrs. 3 0.0

An introduction ranging from the history of electricity and magnetism to connections with real-world phenomena in engineering and biology, and common sense on the understanding of the phenomena. The student is carefully guided through mathematical derivations. Physics is used

to develop the theory and the applications of such things as motors, radios, magnetic resonance imaging (MRI) systems and computers. Not to be held with PHYS 2200, PHYS 2201, PHYS 2600 (016.260) or PHYS 2610 (016.261). Prerequisites: A "C" or better in PHYS 1070 (PHYS 1071, 016.107, 016.106, 016.120), or a "C+" or better in both of PHYS 1020 (PHYS 1021, 016.102) and PHYS 1030 (PHYS 1031, 016.103); and a "C" or better in one of MATH 1230, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), MATH 1520 (136.152), the former 136.153, or MATH 1690 (136.169). Prerequisite or corequisite: MATH 1200 or MATH 1201 or MATH 1240; and one of MATH 1232, MATH 1690, MATH 1700, MATH 1701, MATH 1710, or the former 136.173.

PHYS 2250 Introductory Modern Physics Cr.Hrs. 3 0.0

Come join us as we explore the ground breaking discoveries in physics during the last 100 years that have laid the foundation for our modern high-tech world and brought us nuclear power, computers, nanotechnology and new energy technologies (to name a few). Then, finish off with a look into the future, at the 21st century physics frontier. Not available to students who have previously obtained credit in, or are currently registered in PHYS 2251, PHYS 2380 (016.238) or the former 016.250. Not available to students in Honours or Major programs in Physics. Prerequisites: a "C" or better in PHYS 1070 (PHYS 1071, 016.107, 016.127), or a "C+" or better in both of PHYS 1020 (PHYS 1021, 016.102) and PHYS 1030 (PHYS 1031, 016.103); and a "C" or better in one of MATH 1230, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), MATH 1520 (136.152), the former 136.153, or MATH 1690 (136.169). Prerequisite or corequisite: MATH 1200 or MATH 1201 or MATH 1240; and one of MATH 1232, MATH 1690, MATH 1700, MATH 1701, MATH 1710 or the former 136.173.

PHYS 2260 Optics Cr.Hrs. 3 0.0

(Lab required) A survey of refraction, reflection, simple lens systems and optical systems, dispersion, achromatism and an elementary treatment of diffraction, interference, and polarization. Not to be held with PHYS 2261. Prerequisites: A "C" or better in PHYS 1070 (PHYS 1071, 016.107) or PHYS 2152, or a "C+" or better in both of PHYS 1020 (PHYS 1021, 016.102) and PHYS 1030 (PHYS 1031, 016.103); and a "C" or better in one of MATH 1230, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), MATH 1520 (136.152), the former 136.153, or MATH 1690 (136.169). Prerequisite or corequisite: One of MATH 1220, MATH 1300, MATH 1301 (136.130), or MATH 1310 (136.131); and one of MATH 1232, MATH 1690, MATH 1700, MATH 1701 (136.170), MATH 1710 (136.171), or the former 136.173.

PHYS 2380 Quantum Physics 1 Cr.Hrs. 3 0.0

The first in a sequence of three courses on Quantum Physics. This course introduces the basic principles of quantum theory including cavity radiation and Planck's postulate, wave-particle duality, the Bohr model, and the Schrodinger theory of quantum mechanics. Special emphasis is placed on the derivation of the time independent Schrodinger equation and its solutions in one dimension. Not to be held with the former 016.238 or 016.250. Prerequisites: PHYS 1070 or PHYS 1071 (016.107) or PHYS 2152 (C); and one of MATH 1232 (C), MATH 1690 (136.169) (C), MATH 1700, MATH 1701(136.170)(C), MATH 1710(136.171)(C), or the former 136.173 (C).

PHYS 2390 Theoretical Physics 1 Cr.Hrs. 3 0.0

This course provides an introduction to the mathematics required for both the Honours and Major programs in Physics and Astronomy. Topics include series expansions, partial derivatives, vector calculus and integral theorems. Not to be held with the former 016.237. Prerequisites: PHYS 1070, PHYS 1071 (016.107) (C); and a grade of "C" or better in one of MATH 1232, MATH 1690 (136.169), MATH 1700, MATH 1701 (136.170), MATH 1710 (136.171), or the former 136.173.

PHYS 2600 Electromagnetic Field Theory Cr.Hrs.

0.0

(Lab required) Electric field, electric potential, Gauss' law, capacitors, dielectric materials, magnetic fields, Ampere's law, magnetic induction, magnetic materials, displacement current, integral form of Maxwell's equations. In addition to the lectures, the course includes a tutorial session of two hours per week. Not to be held with 016.260, PHYS 2200 or PHYS 2201 (016.220). Prerequisites: a "C" or better in one of PHYS 1070, PHYS 1071 (016.107), PHYS 2152, the former 016.106, or the former 016.120; and a "C" or better in one of MATH 1232, MATH 1690 (136.169), MATH 1700, MATH 1701 (136.170), MATH 1710 (136.171) or the former 136.173.

NET CHANGE IN CREDIT HOURS: 0.0

Program modifications:

Modifications to the following programs are outlined on the next pages:

- **Bachelor of Science (Honours) in Physics and Astronomy, Options A, B, C**
- **Bachelor of Science (Major) in Physics and Astronomy**

**PHYSICS AND ASTRONOMY
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Proposed Changes to the B.Sc. Honours Degree in Physics and Astronomy (Options A, B, C) and the B.Sc. Major Degree in Physics and Astronomy

Current B.Sc. Honours and Major in Physics and Astronomy:

4.11.2 Physics and Astronomy			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS Option A: Astronomy¹ 120 CREDIT HOURS			
PHYS 1050 (or PHYS 1020) and PHYS 1070 (B) (or PHYS 1030 B+)	PHYS 2070 (6), PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2600, PHYS 2610, PHYS 2650	PHYS 3180, PHYS 3380, PHYS 3430 (6), PHYS 3630, PHYS 3650, PHYS 3670	PHYS 3680, PHYS 3640, PHYS 4230, PHYS 4240 (6), PHYS 4390
MATH 1300 ² , MATH 1500 ² , MATH 1700 ²		MATH 3130	A 3 credit hour, 4000 level Physics and Astronomy course
6 credit hours of ARTS including the "W" requirement.			
		9 credit hours of 3000 and/or 4000 level Physics and Astronomy courses.	
9 credit hours of open electives (PHYS 1810 and PHYS 1820 are highly recommended).	3 credit hours of open electives ³ .	3 credit hours of open electives ³ .	3 credit hours of open electives ³ .
HONOURS Option B: Physics¹ 120 CREDIT HOURS			
PHYS 1050 (or PHYS 1020) and PHYS 1070 (B) (or PHYS 1030 B+)	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 3640, PHYS 4250, PHYS 4390, PHYS 4510, PHYS 4520, PHYS 4590
MATH 1300 ² , MATH 1500 ² , MATH 1700 ²		PHYS 3630, PHYS 3660 MATH 3130	6 credit hours ⁴ chosen from: PHYS 4672, PHYS 4674, PHYS 4676, PHYS 4678
6 credit hours of ARTS including the "W" requirement.			
9 credit hours of open electives	9 credit hours of open electives ³	3 credit hours of open electives ³	6 credit hours of open electives ³
HONOURS Option C: Medical and Biological¹ 120 CREDIT HOURS			
PHYS 1050 (or PHYS 1020), PHYS 1070 ² (B) (or PHYS 1030 B+)	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 3220	PHYS 3640, PHYS 4250, PHYS 4560
MATH 1300 ² , MATH 1500 ² , MATH 1700 ²		MATH 3130	6 credit hours ⁴ chosen from: PHYS 4672, PHYS 4674, PHYS 4676, PHYS 4678
The following can be completed in Year 1 or Year 2:		3 credit hours chosen from: PHYS 4360, PHYS 4400, ECE 3780	
6 credit hours of ARTS including the "W" requirement		15 credit hours of open electives ³	
6 credit hours chosen from: BIOL 1410, BIOL 1412, BIOL 2520			

12 credit hours of open electives ³			
30 Hours	30 Hours	30 Hours	30 Hours
FOUR YEAR MAJOR 120 CREDIT HOURS			
PHYS 1050 ² (or PHYS 1020), PHYS 1070 ² (C+) (or PHYS 1030 (B))	PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2600	PHYS 2610, PHYS 2650, PHYS 3380, PHYS 3630, PHYS 3670, PHYS 3680	PHYS 3640, PHYS 3430 (6), PHYS 3650
MATH 1300 ² , MATH 1500 ² , MATH 1700 ²	MATH 1200	MATH 3130	3 credit hours of 3000 level Physics and Astronomy and 3 hours of 4000 level Physics and Astronomy
6 credit hours from the Faculty of Arts including the required "W" course			
9 credit hours of open electives	12 credit hours of open electives ³	9 credit hours of open electives ³	12 credit hours of open electives ³
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1 Students must achieve a minimum grade of "C" in all courses contributing to the Honours program.

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 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.~~

3 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.

4 The selection of these 6 credit hours must be made in consultation with the Departmental Program Advisor.

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. The number 6 in brackets indicates a 6 credit hour course).

Proposed B.Sc. Honours and Major in Physics and Astronomy:

4.11.2 Physics and Astronomy			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS Option A: Astronomy¹ 120 CREDIT HOURS			
PHYS 1050 (or PHYS 1020) and PHYS 1070 (B) (or PHYS 1030 B+)	PHYS 2070 (6), PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2600, PHYS 2610, PHYS 2650	PHYS 3180, PHYS 3380, PHYS 3430 (6), PHYS 3630, PHYS 3650, PHYS 3670	PHYS 3680, PHYS 3640, PHYS 4230, PHYS 4240 (6), PHYS 4390
MATH 1300 ² , MATH 1500 ² , MATH 1700 ²		MATH 2090	A 3 credit hour, 4000 level Physics and Astronomy course
6 credit hours of ARTS including the "W" requirement.			
		9 credit hours of 3000 and/or 4000 level Physics and Astronomy courses.	
9 credit hours of open electives (PHYS 1810 and PHYS 1820 are highly recommended).	3 credit hours of open electives ³ .	3 credit hours of open electives ³ .	3 credit hours of open electives ³ .
HONOURS Option B: Physics¹ 120 CREDIT HOURS			
PHYS 1050 (or PHYS 1020) and PHYS 1070 (B) (or PHYS 1030 B+)	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 3640, PHYS 4250, PHYS 4390, PHYS 4510, PHYS 4520, PHYS 4590
MATH 1300 ² , MATH 1500 ² , MATH 1700 ²		PHYS 3630,	6 credit hours ⁴ chosen from:
6 credit hours of ARTS including the "W" requirement.		PHYS 3660	PHYS 4672, PHYS 4674, PHYS 4676, PHYS 4678
		MATH 2090	
9 credit hours of open electives	9 credit hours of open electives ³	3 credit hours of open electives ³	6 credit hours of open electives ³
HONOURS Option C: Medical and Biological¹ 120 CREDIT HOURS			
PHYS 1050 (or PHYS 1020), PHYS 1070 ² (B) (or PHYS 1030 B+)	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 3220	PHYS 3640, PHYS 4250, PHYS 4560
MATH 1300 ² , MATH 1500 ² , MATH 1700 ²		MATH 2090	6 credit hours ⁴ chosen from:
			PHYS 4672, PHYS 4674, PHYS 4676, PHYS 4678
The following can be completed in Year 1 or Year 2:		3 credit hours chosen from: PHYS 4360, PHYS 4400, ECE 3780	
6 credit hours of ARTS including the "W" requirement		15 credit hours of open electives ³	
6 credit hours chosen from: BIOL 1410, BIOL 1412, BIOL 2520			
12 credit hours of open electives ³			
30 Hours	30 Hours	30 Hours	30 Hours
FOUR YEAR MAJOR 120 CREDIT HOURS			
PHYS 1050 (or PHYS 1020), PHYS 1070 ² (C+) (or PHYS 1030 (B))	PHYS 2260, PHYS 2380, PHYS 2390, PHYS 2490, PHYS 2600	PHYS 2610, PHYS 2650, PHYS 3380, PHYS 3630, PHYS 3670, PHYS 3680	PHYS 3640, PHYS 3430 (6), PHYS 3650
MATH 1300 ² , MATH 1500 ² , MATH 1700 ²	MATH 1240²	MATH 2090	3 credit hours of 3000 level Physics and Astronomy and 3 hours of 4000 level Physics and Astronomy

6 credit hours from the Faculty of Arts including the required "W" course			
9 credit hours of open electives	12 credit hours of open electives ³	9 credit hours of open electives ³	12 credit hours of open electives ³
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1 Students must achieve a minimum grade of "C" in all courses contributing to the Honours program.

2 **MATH 1220** may be taken in place of MATH 1300; **MATH 1230** or MATH 1510 or MATH 1520 may be taken in place of MATH 1500; **MATH 1232** or MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700. **MATH 1200 may be taken in lieu of MATH 1240.**

3 Although they are not required courses in the Physics programs, **MATH 2150, MATH 2080, MATH 2180, and MATH 3340** are highly recommended electives for the Physics Honours and Four Year Major degrees, and should be taken when possible.

4 The selection of these 6 credit hours must be made in consultation with the Departmental Program Advisor.

IMPORTANT: The Honours and 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. The number 6 in brackets indicates a 6 credit hour course).

Summary & Rationale:

1. New Math courses with appropriate substitutions have been added to the program charts and the footnotes.

Statistics

Modifications:

STAT 2220 Contemporary Statistics for Engineers Cr.Hrs. 3 0.0
(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, or 005.100. Prerequisite: a "C" or better in one of: MATH 1232, MATH 1690, MATH 1700, MATH 1701, MATH 1710.

STAT 2400 Introduction to Probability 1 Cr.Hrs. 3 0.0
(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 the former STAT 3500. Prerequisites: STAT 1000 or STAT 1001 (005.100) (C); and one of or MATH 1232 (C) or MATH 1690 (C) or MATH 1700 (B) or MATH 1701 (B).

STAT 3050 Introduction to Probability Theory and Its Applications Cr.Hrs. 3 0.0
Development of the basic concepts of probability theory and application in areas of biostatistics, actuarial science, reliability theory, queuing theory. Prerequisites: STAT 3400 or the former STAT 3500 (005.350) (C); and MATH 2150 or MATH 2720 or MATH 2721 (or the former MATH 2750) (C).

STAT 3400 Introduction to Probability II Cr.Hrs. 3 0.0
(Lab required) 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 corequisite: one of MATH 2150, MATH 2720, MATH 2721 (or the former MATH 2750) (C), or the former MATH 2730 or MATH 2731.

STAT 3800 Mathematical Statistics Cr.Hrs. 3 0.0
(Lab required) 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 or the former STAT 3500 (005.350) (C).

STAT 4690 Applied Multivariate Analysis Cr. Hrs. 3 0.0
(Formerly 005.469) The course will emphasize applications of various techniques in multivariate analysis and gaining familiarity with the relevant programs in statistical packages, i.e. SAS, BMDP. Prerequisites: STAT 3480 (005.348) (C); and a "C" or better in MATH 1220 (or the former MATH 2300 or MATH 2301) and MATH 2150 (or the former MATH 2720 or MATH 2721 or MATH 2750), or consent of instructor.

NET CHANGE IN CREDIT HOURS: 0.0

The department is proposing program modifications to the following programs, as set out on the next pages:

- **Bachelor of Science (Major) in Statistics**
- **Bachelor of Science (Major) in Statistics, Cooperative Option**
- **Bachelor of Science (Honours) in Statistics**
- **Bachelor of Science (Honours) in Statistics, Cooperative Option**

**STATISTICS
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

**PROPOSED CHANGES TO THE B.Sc. HONOURS & MAJOR DEGREES IN STATISTICS
INCLUDING CO-OP PROGRAMS**

CURRENT B.Sc. HONOURS AND MAJOR IN STATISTICS:

NOTE: Other changes previously endorsed by SCCCC and to be reported to Senate in May 2015. **Shaded** material is new and must be considered by SCCCC

Honours Requirements

Students will normally take STAT 2000 and STAT 2400 in Year 2 and enter Honours in Year 3.

To enter the Honours program in Statistics, a student must have completed at least 24 credit hours with a minimum GPA of 3.00, and also obtained a minimum grade of "B" in STAT 2400. STAT 1000, MATH 1300, MATH 1500, and MATH 1700 are all requirements of the Statistics Honours degree program and students are strongly encouraged to take these courses in Year 1.

Four Year Major Requirements

Students will normally take STAT 2000 and STAT 2400 in Year 2 and enter the four year Major in Year 3.

To enter the Major Degree program in Statistics, a student must have completed at least 24 credit hours with a minimum GPA of 2.00, and also obtained a minimum grade of "C+" in STAT 2400. STAT 1000, MATH 1300, MATH 1500, and MATH 1700 are all requirements of the Statistics Honours degree program and students are strongly encouraged to take these courses in Year 1.

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS (Including Co-operative Option) 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
STAT 1000 MATH 1500 ¹ , MATH 1700 ¹ , MATH 1300 ¹	STAT 2400 (B) MATH 2300, MATH 2720 ¹ , MATH 2730 ¹	STAT 3050, STAT 3400 ⁴ , STAT 3470, STAT 3480, STAT 38004	STAT 4100, STAT 4200, STAT 4520, STAT 4530
The following courses must be taken in Year 1 or Year 2: COMP 1010, STAT 2000, MATH 1200 6 credit hours from the Faculty of Arts, which should include the required "W" course		15 credit hours chosen 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. 6 credit hours chosen from: MATH 2202, MATH 2600, MATH 2800, MATH 3230, MATH 3540, MATH 3600, MATH 3700, MATH 3740 (6), MATH 3800, MATH 3810	

		12 credit hours of approved elective courses - including courses to be chosen from an area of application outlined in note 2 below. ²	
21 credit hours of elective courses - including courses to be chosen from an area of application outlined in note 2 below. ²	Co-op Requirements: STAT 3980		Co-op Requirements: STAT 3990, STAT 4980, STAT 4990 (if a 4th work term selected)
30 Hours	30 Hours	30 Hours	30 Hours
HONOURS DOUBLE MINIMUM 120 CREDIT HOURS By arrangement with the departments concerned			

FOUR YEAR MAJOR⁵ (Including Co-operative Option) 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
STAT 1000 MATH 1500 ¹ , MATH 1700 ¹ , MATH 1300 ¹	STAT 2400 (C+) MATH 2300, MATH 2720 ¹ , MATH 2730 ¹	STAT 3050, STAT 3400 ⁴ , STAT 3470, STAT 3480, STAT 3800 ⁴	STAT 4100, STAT 4200, STAT 4520, STAT 4530
The following courses must be taken in Year 1 or Year 2: COMP 1010, STAT 2000, MATH 1200 6 credit hours from the Faculty of Arts, which should include the required "W" course 21 credit hours of elective courses - including courses to be chosen from an area of application outlined in note 3 below. ³		15 credit hours chosen from: STAT 3170, STAT 3380, STAT 3490, STAT 4170, STAT 4580, STAT 4590, STAT 4600, STAT 4630, STAT 4690, STAT 4700 6 credit hours chosen from: MATH 2202, MATH 2600, MATH 2800, MATH 3230, MATH 3540, MATH 3600, MATH 3700, MATH 3740 (6), MATH 3800, MATH 3810 12 credit hours of elective courses - including courses required for the chosen area of application outlined in note 3 below. ³	
		Co-op Requirements: STAT 3980	Co-op Requirements: STAT 3990, STAT 4980, STAT 4990 (if a 4th work term is selected)
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. MATH 1690 may be taken in place of both MATH 1700 and 1500. MATH 2750 may be taken in place of MATH 2720 and 2730.

2 Of the electives chosen as part of the Honours Degree, 18 credit hours are to be selected from one department which represents a field of application such as: Actuarial Mathematics, Biological Sciences, Microbiology, 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.

3 Of the electives chosen as part of the Major Degree, 15 credit hours must be selected from either, Computer Science and Mathematics, or from one of the following departments: Actuarial Mathematics, Biological Sciences, Microbiology, Economics, Psychology, or Sociology.

4 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.~~

5 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.

(The number 6 in brackets indicates a six credit hour course)

PROPOSED B.SC. HONOURS AND MAJOR IN STATISTICS:

Honours Requirements

Students will normally take STAT 2000 and STAT 2400 in Year 2 and enter Honours in Year 3.

To enter the Honours program in Statistics, a student must have completed at least 24 credit hours with a minimum GPA of 3.00, and also obtained a minimum grade of "B" in STAT 2400. STAT 1000, **MATH 1220, MATH 1230, MATH 1232, and MATH 1240** are all requirements of the Statistics Honours degree program and students are strongly encouraged to take these courses in Year 1.

Four Year Major Requirements

Students will normally take STAT 2000 and STAT 2400 in Year 2 and enter the four year Major in Year 3.

To enter the Major Degree program in Statistics, a student must have completed at least 24 credit hours with a minimum GPA of 2.00, and also obtained a minimum grade of "C+" in STAT 2400. STAT 1000, **MATH 1220, MATH 1230, MATH 1232 and MATH 1240** are all requirements of the Statistics **Major** degree program and students are strongly encouraged to take these courses in Year 1.

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS (Including Co-operative Option) 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
STAT 1000 MATH 1220¹, MATH 1230¹, MATH 1232¹ MATH 1240	STAT 2400 ⁴ (B) MATH 2030, MATH 2080, MATH 2150	STAT 3050, STAT 3400 ⁴ , STAT 3470, STAT 3480, STAT 3800	STAT 4100, STAT 4200, STAT 4520, STAT 4530
The following courses must be taken in Year 1 or Year 2: COMP 1010, STAT 2000 6 credit hours from the Faculty of Arts, which should include the required "W" course		15 credit hours chosen 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. 6 credit hours chosen from: MATH 2140, MATH 2160, MATH 2180, MATH 3340, MATH 3440, MATH 3460, MATH 3470, MATH 3472 12 credit hours of approved elective courses - including courses to be chosen from an area of application outlined in note 2 below. ²	
21 credit hours of elective courses - including courses to be chosen from an area of application outlined in note 2 below. ²		Co-op Requirements: STAT 3980	Co-op Requirements: STAT 3990, STAT 4980, STAT 4990 (if a 4th work term selected)
30 Hours	30 Hours	30 Hours	30 Hours
HONOURS DOUBLE MINIMUM 120 CREDIT HOURS By arrangement with the departments concerned			

FOUR YEAR MAJOR⁵ (Including Co-operative Option) 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
STAT 1000 MATH 1220¹, MATH 1230¹, MATH 1232¹ MATH 1240	STAT 2400 ⁴ (C+) MATH 2030, MATH 2080, MATH 2150	STAT 3050, STAT 3400 ⁴ , STAT 3470, STAT 3480, STAT 3800	STAT 4100, STAT 4200, STAT 4520, STAT 4530
<p>The following courses must be taken in Year 1 or Year 2: COMP 1010, STAT 2000, 6 credit hours from the Faculty of Arts, which should include the required "W" course 21 credit hours of elective courses - including courses to be chosen from an area of application outlined in note 3 below.³</p>		<p>15 credit hours chosen from: STAT 3170, STAT 3380, STAT 3490, STAT 4170, STAT 4580, STAT 4590, STAT 4600, STAT 4630, STAT 4690, STAT 4700 6 credit hours chosen from: MATH 2140, MATH 2160, MATH 2180, MATH 3340, MATH 3440, MATH 3460, MATH 3470, MATH 3472 12 credit hours of elective courses - including courses required for the chosen area of application outlined in note 3 below.³</p>	
		Co-op Requirements: STAT 3980	Co-op Requirements: STAT 3990, STAT 4980, STAT 4990 (if a 4th work term is selected)
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1 The following substitutes are allowed: MATH 1300 (B) in place of MATH 1220, MATH 1500 (B) or MATH 1510 (B) in place of MATH 1230, MATH 1700 (B) or MATH 1710 (B) in place of MATH 1232, MATH 1690 (C) in place of MATH 1230 and MATH 1232.

2 Of the electives chosen as part of the Honours Degree, 18 credit hours are to be selected from one department which represents a field of application such as: Actuarial Mathematics, Biological Sciences, Microbiology, 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.

3 Of the electives chosen as part of the Major Degree, 15 credit hours must be selected from either, Computer Science and Mathematics, or from one of the following departments: Actuarial Mathematics, Biological Sciences, Microbiology, Economics, Psychology, or Sociology.

4 STAT 3400 has a pre or co-requisite of MATH 2150. Therefore students who wish to take STAT 3400 should consider taking MATH 2150 in YEAR 2.

5 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.

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

Summary:

1. Add Math 1240 as a course recommended to be completed in Year 1.
2. Add to Footnote 1 that MATH 1510 (B) & MATH 1710 (B) can be used in place of MATH 1230 & 1232 respectively.

Rationale:

1. MATH 1240 is prerequisite to second year courses, so it is a good idea for students to complete in Year 1.
2. MATH 1510 & 1710 are suitable substitutions for MATH 1230 & 1232.

Program modifications:

Modifications to the **Bachelor of Science (Joint Honours) in Statistics and Actuarial Mathematics** are outlined on the next pages.

STATISTICS – ACTUARIAL MATHEMATICS JOINT HONOURS PROGRAM
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM

Proposed Changes to the Joint B.Sc. Honours Degree Statistics – Actuarial Mathematics

Current B.Sc. Statistics and Actuarial Mathematics Joint Honours Program Chart:

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.			
Entry Requirements:			
To enter the Joint Honours program, students must have completed 24 credit hours with a minimum DGPA of 3.00. Students must also obtain a minimum grade of "B" in one of the following courses: an approved Written English course, (both of) ECON 1010 and ECON 1020, MATH 1300, MATH 1500, MATH 1700 or STAT 1000; and must also obtain a minimum grade of "B" in STAT 2000.			
To graduate with the B. Sc. Honours degree, a student must achieve a minimum DGPA of 3.00 and a minimum grade of "C+" on all required Actuarial Mathematics (ACT) courses and a grade of "C" on all remaining courses that contribute to the 120 credit hours of the degree.			
NOTE: In order to receive course credit for, and examination exemptions from, future Society of Actuaries (SoA) and VEE courses, students must obtain a minimum grade of "B" in the following courses: ECON 1010, ECON 1020, ACC 1100, FIN 2200, STAT 3470, and STAT 3490. Contact the Warren Centre for Actuarial Studies and Research for further information.			
Recommended Electives:			
ACT 4000, ACT 4150, ACT 4240; FIN 3410; COMP 1010; STAT 4630			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS			
STAT 1000, STAT 2000 (B)	STAT 2400, STAT 3400	STAT 3050, STAT 3480, STAT 3800	STAT 3470 ³ , STAT 3490 ³ , STAT 4100, STAT 4200, STAT 4520, STAT 4530
ECON 1010 ³ , ECON 1020 ³	ACT 2020, ACT 2120	ACT 3630, ACT 2240, ACT 3340,	ACT 4060, ACT 4630
MATH 1300 ¹ , MATH 1500 ¹ , MATH 1700(B) ¹	MATH 2720 ¹ , MATH 2730 ¹	MSCI 2150-	
3 credit hour "W" course	MATH 2300 ¹		
6 credit hours of electives	3 credit hours of approved electives	6 credit hours of approved electives	3 credit hours of approved 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; MATH 1690 may be taken in place of both of MATH 1500 and MATH 1700; MATH 2750 may be taken in place of both of MATH 2720			

and MATH 2730; MATH 2352 (6) may be taken in place of MATH 2300.

² Students are strongly urged to complete ACC 1100 in Year 1 when possible FIN 2200 may be taken in Year 2, 3 or 4; however, it is strongly recommended that it be completed in Year 2. Note that ACC 1100 is a prerequisite for FIN 2200.

³ In order to receive course credit for, and examination exemptions from, future Society of Actuaries (SoA) and VEE courses, students must obtain a minimum grade of "B" in these courses.

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

Proposed B.Sc. Statistics and Actuarial Mathematics Joint Honours:

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.

Entry Requirements:

To enter the Joint Honours program, students must have completed 24 credit hours with a minimum DGPA of 3.00. Students must also obtain a minimum grade of "B" in STAT 2000. **All of the courses listed in Year 1 of the program chart are program requirements and students are strongly urged to take them in the first year.**

To continue in the Joint Honours Statistics – Actuarial Mathematics program, students must maintain a minimum DGPA of 3.00, and complete a minimum of 9 credit hours during each Fall and Winter Term.

To graduate with the B. Sc. Honours degree, a student must achieve a minimum DGPA of 3.00 and a minimum grade of "C+" on all required Actuarial Mathematics (ACT) courses and a grade of "C" on all remaining courses that contribute to the 120 credit hours of the degree.

The following courses with a "B" or better may be used for Society of Actuaries (SoA) VEE credits: ECON 1010, ECON 1020, FIN 2200, STAT 3470, and STAT 3490. Contact the Warren Centre for Actuarial Studies and Research for further information.

Recommended Electives:

ACT 4000, ACT 4150, FIN 3410, COMP 1010, STAT 4630

YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS			
STAT 1000, STAT 2000 (B)	STAT 2400, STAT 3400	STAT 3050, STAT 3470 ³ , STAT 3480, STAT 3490 ^{3,4} , STAT 3800	STAT 4100, STAT 4200, STAT 4520, STAT 4530
ECON 1010 ³ , ECON 1020 ³	ACT 2020, ACT 2120, ACT 2210	ACT 3340, ACT 3630 (or both ACT 3130 & ACT 3230)	ACT 4060, ACT 4160, ACT 4630 ⁴
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240	ACC 1100 ² , FIN 2200 ^{2,3}		MSCI 2150
3 credit hour "W" course	MATH 2720		
3 credit hours of electives	6 credit hours of approved electives	6 credit hours of approved electives	3 credit hours of approved electives
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

¹ The following substitutions are allowed: MATH 1300 (C) or MATH 1310 (C) in place of MATH 1220 (C), MATH 1500 (B) or MATH 1510 (B) in place of MATH 1230 (C), MATH 1700 (B) or MATH 1710 (B) in place of MATH 1232 (C).

² Students are strongly urged to complete ACC 1100 in Year 1 when possible FIN 2200 may be taken in Year 2, 3 or 4; however, it is strongly recommended that it be completed in Year 2. Note that

ACC 1100 is a prerequisite for FIN 2200.

³ These courses may be used for SOA VEE credits if a grade of B or better is achieved. Contact the Warren Centre for Actuarial Studies and Research for further information.

⁴ STAT 3490 and ACT 4630 may be taken in Year 3 or 4.

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

Summary of Changes:

1. Modify the text in the entry requirements to reflect that while not all courses listed in the chart in Year 1 are required for admission, the departments recommend that they be completed in Year 1.
2. The continuation requirements were missing from the calendar entry, so the information has been added.
3. In the chart replace MATH 1300 with MATH 1220, MATH 1500 with MATH 1230, MATH 1700 with MATH 1232.
 - Add MATH 1240 to the Year 1 requirement.
 - Add a footnote about acceptable Math substitutions.
 - Remove MATH 2730 and MATH 2300.
3. Move STAT 3470 to a Year 3 requirement.
4. Add that ACT 3130 & ACT 3230 may be used in place of ACT 3630.
5. Add a footnote that STAT 3490 and ACT 4630 may be taken in Year 3 or 4.
6. Add ACT 4160 to the Year 4 requirement.
7. ACC 1100 is deleted from the VEE credit list.
8. ACT 4240 was removed from recommended electives list.

Rationale:

1. Rewording of the entry requirements section to point students to the program chart for information.
2. The continuation requirements were added for information purposes.
3. The changes in Mathematics courses are based on the proposed changes to the Mathematics curriculum.
3. STAT 3470 should be taken in Year 3 because this course is a prerequisite to STAT 3480. STAT 3480 is a required course in Year 3.
4. ACT 3130 & 3230 are suitable substitutions for ACT 3630.
5. Although ACT 4630 can be taken in either Year 3 or Year 4, we recommend students to take it in Year 3 so that they would have two more attempts to write actuarial Exam C before graduation. STAT 3490 is a third year course in all statistics programs, and it is recommended to take it in Year 3. However, if a student cannot take it in Year 3, it may be taken in Year 4.
6. The adding of ACT 4160 Introduction to Property and Casualty Insurance Industry is to replace the old ACT 4000 to fulfill the need for knowledge in Property & Casualty insurance.
7. UM students now only need FIN 2200 to meet the VEE Corporate Finance requirement.
8. ACT 4240 is no longer offered.

Program modifications:

Modifications to the **Bachelor of Science (Joint Honours) in Statistics and Economics** are outlined on the next pages.

STATISTICS-ECONOMICS JOINT HONOURS PROGRAM
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM

Current B.Sc. Statistics-Economics Joint Honours Program:

The Department of Statistics along with the Department of Economics (Faculty of Arts) offer a Joint Honours program for students wishing in depth study in Statistics and Economics. For Economics course listings, refer to the Faculty of Arts chapter in the Calendar.			
Students will normally take STAT 2000 and STAT 2400 in second year and enter Honours in Year 3.			
To enter the Joint Honours Statistics Economics program, the student must have a minimum grade of "B" in both of ECON 1010 and ECON 1020 (or ECON 1210 and ECON 1220) and STAT 2400; and an average grade of "B" or better with a minimum grade of "C+" in each of MATH 1500 and MATH 1700 or any equivalents and have satisfied the Faculty of Science requirements for entry to the honours program.			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS			
ECON 1010 (B) and ECON 1020 ² (B) STAT 1000 MATH 1300 ¹ , MATH 1500 ¹ , MATH 1700 ¹ COMP 1010	ECON 2700, ECON 2800 STAT 2000, STAT 2400 MATH 2202, MATH 2352 (6), MATH 2750 (6)	ECON 3700, ECON 3800 STAT 3470, STAT 3480, STAT 3490, STAT 3400, STAT 3800 One of: MATH 3740 (6) or MATH 3760 (6)	ECON 4120, ECON 4130 STAT 4100, STAT 4520, STAT 4530, STAT 4580
9 credit hours of electives including the required "W" course.	3 credit hours of approved Economics electives ³	3 credit hours of approved Economics electives ³	12 credit hours of approved Economics electives ³
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 MATH 1700.

2 ECON 1210 and ECON 1220 may be used in place of ECON 1010 and ECON 1020.

3 Of the 18 credit hours in Economics electives 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.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed B.Sc. Statistics-Economics Joint Honours Program:

The Department of Statistics along with the Department of Economics (Faculty of Arts) offer a Joint Honours program for students wishing in depth study in Statistics and Economics. For Economics course listings, refer to the Faculty of Arts chapter in the Calendar.

Students will normally take STAT 2000 and STAT 2400 in second year and enter Honours in Year 3.

To enter the Joint Honours Statistics Economics program in the Faculty of Science, the student must have a minimum grade of "B" in both of ECON 1010 and ECON 1020 (or ECON 1210 and ECON 1220) and STAT 2400; and an average grade of "B" or better with a minimum grade of "C+" in each of MATH 1220, MATH 1230 and MATH 1232 or any equivalents and have satisfied the Faculty of Science requirements for entry to the honours program.

YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS TOTAL: 120 CREDIT HOURS			
Both ECON 1010 and ECON 1020, or both ECON 1210 and ECON 1220. STAT 1000 MATH 1220 ¹ MATH 1230 ¹ MATH 1232 ¹ MATH 1240 COMP 1010	ECON 2010 ECON 2020 STAT 2000 STAT 2400 MATH 2030 MATH 2080 MATH 2140 MATH 2150	ECON 3010 ECON 3020 STAT 3400 STAT 3470 STAT 3480 STAT 3490 STAT 3800 MATH 2160 MATH 3360	ECON 4040 ECON 4042 STAT 4100 STAT 4200 STAT 4520 STAT 4530
6 credit hours of electives including the required "W" course	6 credit hours of approved Economics electives ²	3 credit hours of approved Economics electives ²	12 credit hours of approved Economics electives ²
30 Hours	30 Hours	30 Hours	30 Hours

NOTES:

1 The following substitutes are allowed: MATH 1300 in place of MATH 1220, MATH 1500 in place of MATH 1230, MATH 1700 in place of MATH 1232. Students must attain specific grade requirements in order to meet the upper level course prerequisites. Consult course descriptions for further information.

2 Of the 21 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 2030 and ECON 3040 are recommended in Year 2 or 3. The normal prerequisite for ECON 3040 is ECON 2040, which will be waived for students in this program who have completed Year 1.

Summary & Rationale:

The proposed program reflects the recent undergraduate curriculum revision of the Department of Mathematics. The Department of Mathematics introduced 47 new courses, and deleted most of the existing courses. Although they have renumbered most of the courses, the contents of many courses are changed. We have carefully reviewed the contents of all the courses and replaced the existing MATH courses (strike-through font) by the proposed new courses (in bold font) according to

different years in the program. We have also indicated the substitutions of some of the required courses in the Notes section.

Additionally, the Economics program has undergone a curriculum revision and those changes are reflected here.

STAT 4580 is replaced with STAT 4200 in the 4th year of the Statistics-Economics Joint Honours Program. STAT 4580 is not offered every year. STAT 4200 will be a good fit to the Statistics-Economics joint honours program as this course offers advanced statistical inference including methods of hypothesis testing. STAT 4100 (Statistical Inference 1) is a required course in this program. STAT 4200 (Statistical Inference 2) should be a required course too as these two courses go together. Please also note that STAT 4200 is a required course in most of our other joint honours programs.

Université de Saint-Boniface

Faculty of Arts

English

Modification:

ENGL 2001 Intermediate Writing and Research Cr.Hrs. 6 0.0
(Ancien 004.200) Designed to teach students how to read, write, and research at the university level, this courses stresses effective expository writing, prose reading, and research skills. There is no prerequisite for this course. Note: Credit in ENGL 2001 (004.200) is acceptable toward a degree in Arts or Science, but does not satisfy the humanities requirement in the Faculty of Arts. It may not be held for credit in the 30 hours for a Major (General) or the 18 hours for a Minor but may be held for credit in the 48 hours for the Major (Advanced). On ne peut se faire créditer ENGL 2001 et ENGL 2000 (004.200).

NET CHANGE IN CREDIT HOURS: 0.0

German

Deletion:

GRMN 2101 Allemand intermédiaire Cr.Hrs. 6 -6.0

Introductions:

GRMN 2103 Allemand intermédiaire 1 (A) L Cr.Hrs. 3 +3.0
Trois heures de cours plus une heure de conversation par semaine. Révision de la grammaire, exercices, développement des compétences orales pratiques, conversation et usage moderne. Introduction à la prose et à la poésie allemande. On ne peut se faire créditer GRMN 2103 et GRMN 2101 ou GRMN 2100. Préalables: Allemand 40S ou une note minimale de C dans GRMN 1121, GRMN 1120 ou GRMN 1125, ou l'autorisation écrite du professeur ou de la professeure.

GRMN 2105 Allemand intermédiaire 2 (A) L Cr.Hrs. 3 +3.0
Trois heures de cours plus une heure de conversation par semaine. Révision de la grammaire, exercices, développement des compétences orales pratiques, conversation et usage moderne. Exploration plus approfondie de la prose et de la poésie allemande. On ne peut se faire créditer GRMN 2105 et GRMN 2101 ou GRMN 2100. Préalables: une note minimale de C dans GRMN 2103, ou l'autorisation écrite du professeur ou de la professeure.

NET CHANGE IN CREDIT HOURS: 0.0

Philosophy

Introduction:

PHIL 2901 Philosophie de la démocratie Cr.Hrs. 3 +3.0
À partir d'une réflexion portant sur l'émergence de la démocratie et de ses fondements, d'une réflexion portant sur son implantation de plus en plus universelle et d'une réflexion portant sur ce que la démocratie contient comme promesses et dangers, le cours, à l'aide des penseurs les plus importants pour approcher la démocratie, veut aider les étudiant(e)s à mieux comprendre philosophiquement le système politique dans lequel ils vivent.

NET CHANGE IN CREDIT HOURS: +3.0

Political Science

Modification:

POLS 2561 Questions d'actualité en politique canadienne Cr.Hrs. 6 0.0
(Ancien 019.256) Analyse des activités du gouvernement canadien dans certains domaines problématiques ainsi qu'une revue des différentes approches à ces problèmes. Préalable: [un de l'ancien POLS 1501, POLS 1500 (019.150), POLS 1561 ou POLS 1560 (019.156)] ou [POLS 1503 et POLS 1505], ou l'autorisation écrite de la professeure ou du professeur.

NET CHANGE IN CREDIT HOURS: 0.0

Faculty of Education

Introduction:

EDUB 4205 Didactiques: L'approche par projet Cr.Hrs. 6 +6.0
Exploration d'une approche par projet où l'élève est acteur, s'implique et devient responsable. On ne peut se faire créditer EDUB 4205 et EDUB 4203.

NET CHANGE IN CREDIT HOURS: +6.0

Faculty of Science

Chemistry

Modification:

CHEM 2361 Biochimie I: Les molécules biochimiques et une introduction à la énergie métabolique Cr.Hrs. 3 0.0
(Labo requis)(Ancien 002.236) Introduction aux différents types moléculaires rencontrés en biochimie ainsi qu'au concept d'énergie métabolique comme produit du catabolisme nécessaire à la biosynthèse. Aussi offert par le Département de microbiologie sous la cote MBIO 2361. On ne peut se faire créditer CHEM 2361 et CHEM 2360 (002.236), CHEM 2770 (002.277), CHEM 2860 (002.286), MBIO 2361, MBIO 2360 (060.236), ou MBIO 2770 (060.277). Préalables: une

note minimale de C+ dans CHEM 1311 ou CHEM 1310 (002.131) et une note minimale de C dans BIOL 1031 ou BIOL 1030 (071.125). N. B.: CHEM 2361 ne peut être reconnu aux fins des 12 crédits requis en chimie pour les étudiantes et les étudiants inscrits à Université 1 avant 2007-2008. Pour les personnes qui suivent les nouveaux règlements du baccalauréat général (2008-2009), CHEM 2361 peut faire partie des 18 crédits de chimie ou de microbiologie de niveau avancé.

NET CHANGE IN CREDIT HOURS: 0.0

Microbiology

Modification:

MBIO 2361 Biochimie I: Les molécules biochimiques et une introduction à la énergie métabolique Cr.Hrs. 3 0.0

(Labo requis)(Ancien 060.236) Introduction aux différents types moléculaires rencontrés en biochimie ainsi qu'au concept d'énergie métabolique comme produit du catabolisme nécessaire à la biosynthèse. Aussi offert par le Département de chimie sous la cote CHEM 2361. On ne peut se faire créditer MBIO 2361 et MBIO 2360 (060.236), MBIO 2770 (060.277), CHEM 2361, CHEM 2360 (002.236), CHEM 2770 (002.277) ou CHEM 2860 (002.286). Préalables: une note minimale de C+ dans CHEM 1311 ou CHEM 1310 (002.131) et une note minimale de C dans BIOL 1031 ou BIOL 1030 (071.125). N. B.: MBIO 2361 ne peut être reconnu aux fins des 12 crédits requis en chimie pour les étudiantes et les étudiants inscrits à Université 1 avant 2007-2008. Pour les personnes qui suivent les nouveaux règlements du baccalauréat général (2008-2009), MBIO 2361 peut faire partie des 18 crédits de chimie ou de microbiologie de niveau avancé.

NET CHANGE IN CREDIT HOURS: 0.0

School of Social Work

Introduction:

SWRK 3153 Formation à la pratique du terrain I: Reconnaissance des acquis (RDA) +12.0
Cr.Hrs.12

La RDA (SWRK 3153) est un cours d'autoformation grâce auquel l'étudiante ou l'étudiant jugé admissible, aura l'occasion de démontrer des habiletés et des connaissances de base comme tous les étudiants doivent le faire lors de leur première formation (stage) pratique. Ils devront démontrer leurs connaissances de l'engagement, de l'évaluation des besoins ou de la problématique, du plan d'action, de l'intervention et de l'évaluation de l'intervention en service social ainsi que leur intégration des valeurs et de l'éthique et des cadres théoriques acquis par l'entremise des cours de base préalables. Les personnes admises et inscrites au cours SWRK 3153 en remplacement d'un premier stage pratique (SWRK 3151) devront réaliser tous les travaux du cahier de travail dans les délais prévus et communiquer avec l'évaluateur ou l'évaluatrice du cours de RDA lorsque des explications ou un soutien additionnel sont nécessaires. Si les travaux et les rapports sont exécutés de façon satisfaisante, les étudiantes et étudiants seront ensuite évalués et obtiendront une note finale, soit « passage » ou « échec ». On ne peut se faire créditer SWRK 3153 et SWRK 3150, SWRK 3151 ou SWRK 3152.

Préalables: SWRK 1311 (SWRK 1310), SWRK 2081 (SWRK 2080), SWRK 2091 (SWRK 2090) et SWRK 3141 (SWRK 3140). Concomitant: SWRK 4201 (SWRK 4200).

NET CHANGE IN CREDIT HOURS: +12.0

April 7, 2015

Ms. Shannon Coyston, Academic Specialist
Office of the University Secretary
312 Administration Building

Re: Application for Approval under Section 64 of the Manitoba Medical Act - Dr. Katya Rozovsky

Dear Colleagues:

The Senate Committee on Medical Qualifications met on March 24, 2015 to consider the application from the Department of Radiology, College of Medicine, to grant Dr. Rozovsky a certificate under the academic seal of the university. Dr. Rozovsky's Curriculum Vitae and letters of support are enclosed.

Dr. Rozovsky received her medical degree in 1995 and did her internship at the Cheliabinsk State Clinical Institute of Postgraduate Medical Education, Department of Obstetrics and Gynecology. Her postgraduate training in Radiology was at Tel-Aviv University, Tel-Aviv, Israel and in Diagnostic Radiology at the Hadassah Hospital, Hebrew University Medical Center, Jerusalem, Israel (2001 – 2006). In August of 2008 she was a Visiting Fellow in Pediatric Neuroradiology, Department of Radiology, Children's Hospital Boston, Harvard School of Medicine, Boston MA. She did her Fellowship in Pediatric Radiology at the Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, Ontario (2010 – 2011). She is highly recommended as a well-trained radiologist with outstanding teaching skills, interpersonal skills and clinical imaging experience.

The Senate Committee on Medical Qualifications unanimously supports this application for the use of Section 64. The Committee recommends your support for this application to the College of Physicians and Surgeons of Manitoba to grant Dr. Rozovsky a certificate under the academic seal of the University.

Sincerely,



Sara J. Israels, MD FRCPC
Assistant Dean (Academic)
Chair, Senate Committee on Medical Qualifications

Cc: Dr. Marco Essig, Head, Department of Radiology
Dr. Brian Postl, Vice Provost, Faculty of Health Sciences & Dean, College of Medicine
Dr. Anna Ziomek, Registrar, College of Physicians & Surgeons of Manitoba

/md

Report of the Executive Committee of the Faculty of Graduate Studies on Course and Curriculum Changes

Preamble

1. The Faculty of Graduate Studies has responsibility for all matters relating to the submission of graduate course, curriculum and program changes. Recommendations for new programs or changes are submitted by the Faculty Council of Graduate Studies for the approval of Senate.
2. In October 2007, the Faculty of Graduate Studies approved a process of *Streamlining Course Introductions, Modifications, & Deletions* which allows the Executive Committee to approve these changes in lieu of Faculty Council when the courses are not associated with a new program or program changes.
2. The Faculty of Graduate Studies Executive Committee met on the above date to consider proposals from the Asper School of Business (MBA) and Dept. of Biochemistry & Medical Genetics (College of Medicine).

Observations

1. The **Asper School of Business** Master of Business Administration program proposes the deletion of three courses, the introduction of two courses, and the modification of six courses. The deletions/introductions intend to update the course numbering from the 6000 level to the 7000. One 7000 level deletion is re-introduced under a new number to update the course title and content/description. The course modifications entail an update to the course descriptions to reflect new pre-requisite numbering (in accordance with the shift to all 7000-level numbers).

Course Deletions

MKT 6080 Marketing	3
MKT 7230 Seminar in Consumer Behaviour	3
MSCI 6070 Quantitative Analysis	3

Course Introductions

MKT 7010 Marketing Management	3
--------------------------------------	----------

Discussion of the marketing function and its importance to the organization. The course will focus on strategic and tactical issues related to market segmentation, positioning, targeting, product management, pricing, promotion, and distribution, both from a for-profit and not-for-profit perspective.

MKT 7232 Consumer Behaviour**3**

The intensive study of customer psychology associated with the development of effective marketing techniques. An in-depth knowledge of what motivates customers and the manner in which they make purchase decisions helps managers in predicting customer reactions to changes in the marketing mix and to the introduction of new products and services. Course topics first examine customers at the individual-level, and then address the interdependent aspects of consumption behavior by examining its social and cultural context. Pre- or co-requisite: MKT 7010 (formerly MKT 6080).

Course Modifications**MKT 7200 Decisions and Concepts in Marketing****3**

Application of the principles of marketing from a managerial viewpoint; emphasis on marketing planning, strategy, and control; and appraisal of the effectiveness of marketing activities. Prerequisite: MKT 7010 (formerly MKT 6080).

MKT 7210 Marketing and Competitive Behaviour**3**

Designed to give the student a deeper understanding of the dynamics of marketing behavior. Oriented towards theoretical conceptualizations of the problems and practices in marketing areas. Prerequisite: MKT 7010 (formerly MKT 6080).

MKT 7220 Seminar in Marketing**3**

Study of selected topics in marketing with emphasis on recent theoretical developments and their application. Prerequisite: MKT 7010 (formerly MKT 6080).

MKT 7300 International Marketing**3**

A study of problems and opportunities of marketing in foreign environments. It will focus on the cultural, economic and geographical problems encountered in managing the marketing function from a Canadian manager's perspective. Prerequisites: MKT 7010 (formerly MKT 6080).

MKT 7500 Readings in Marketing**3**

Supervised readings in one of the areas of Marketing. Prerequisites: MKT 7010 (formerly MKT 6080) and at least one other graduate level marketing course.

IDM 5120 Career Development Seminar**1**

The Career Development Seminar is designed to assist students in developing personal career planning and management skills. Fundamentals of career success are covered including career assessment, resume and cover letter writing, interviewing, business etiquette and professional networking. This course is graded on a pass/fail basis.

2. The **Dept. of Biochemistry & Medical Genetics** proposes the modification of one course to update the course description and thereby better reflect the course content.

Course Modification

BGEN 7250 Gene Expression

3

Three hours per week, one term. Chromatin structure. Epigenetic regulation of transcription. Gene expression regulation. Bioinformatics.

Recommendations

The Executive Committee recommends THAT: the course changes from the units listed below be approved by Senate:

Asper School of Business (MBA)

Dept. of Biochemistry & Medical Genetics

Respectfully submitted,

Dr. John (Jay) Doering, Chair
Faculty of Graduate Studies Executive Committee

/ak

Report of the Executive Committee of the Faculty of Graduate Studies on Course and Curriculum Changes

Preamble

1. The Faculty of Graduate Studies has responsibility for all matters relating to the submission of graduate course, curriculum and program changes. Recommendations for new programs or changes are submitted by the Faculty Council of Graduate Studies for the approval of Senate.
2. In October 2007, the Faculty of Graduate Studies approved a process of *Streamlining Course Introductions, Modifications, & Deletions* which allows the Executive Committee to approve these changes in lieu of Faculty Council when the courses are not associated with a new program or program changes.
2. The Faculty of Graduate Studies Executive Committee met on the above date to consider a proposal from the Dept. of Sociology (Arts).

Observations

1. The **Dept. of Sociology** proposes the modification of one (1) course to remove the former prerequisites (C+ or better in SOC 4540; or written consent of department head). The reason being that SOC 4540 no longer exists and graduate level courses in Sociology do not normally have formal prerequisites (except for one, Advanced Quantitative Research Methods).

Course Modification

Issues in Health Care Seminar

3

An advanced seminar designed to examine current issues in health care. The content of this course may vary from year to year depending on interest and need.

NO CREDIT HOUR CHANGE

Recommendations

The Executive Committee recommends THAT: the course change from the units listed below be approved by Senate:

Dept. of Sociology

Respectfully submitted,

Dr. John (Jay) Doering, Chair
Faculty of Graduate Studies Executive Committee

/ak



UNIVERSITY
OF MANITOBA

Faculty of
Health Sciences

Office of the Dean
230-745 Bannatyne Avenue
Winnipeg, Manitoba R3E 0J9
204-789-3485
brian.postl@med.umanitoba.ca

REVISED MEMORANDUM

April 1, 2015

To: Dr. Joanne Keselman, Vice-President (Academic) & Provost

From: Dr. Brian Postl, Vice Provost and Dean Faculty of Health Sciences

Subject: Family Social Sciences Undergraduate Program Regulations

As part of the University of Manitoba's Academic Structure Initiative (ASI), *Senate* has approved in principle and recommended to the Board of Governors the merger of the **Department of Family Social Sciences (FSS)**, Faculty of Human Ecology (HE), and the **Department of Community Health Sciences (CHS)**, College of Medicine, Faculty of Health Sciences (FHS). On June 24, 2014, the Board of Governors approved this recommendation. Accordingly, effective July 1, 2015, all associated programs in the Family Social Sciences will become part of the College of Medicine, Department of Community Health Sciences. The programmes affected include:

- Bachelor of Human Ecology (Family Social Sciences)
- After Degree Program in Family Social Sciences (Bachelor of Human Ecology)
- Minor in Family Social Sciences

It was agreed that, until such time as a full review of the academic regulations for these programmes has been carried out, the programmes should continue to be governed by the relevant HE and FSS regulations. It was envisioned that the full review and Senate ratification must be completed before June 30, 2016

At this point, as there is no possibility of gaining full approval for this transitional arrangement before 1st July 2015, it is proposed that the resolution below be sent to College of Medicine Executive Council for approval April 28th, 2015 and then be passed on to the appropriate committees of Senate in order to gain full Senate approval, as and when the Senate calendar allows. In the meantime we seek the agreement of the Provost's office that we can proceed as if this resolution had been fully approved.

The resolution to be presented to the College of Medicine Executive Council for approval is:

“College of Medicine Executive Council approved the motion that after 1st July 2015, programmes offered by FSS will continue to be governed by the relevant components of the current HE and FSS regulations until such time as a complete review of the regulations has been undertaken and the results of such review are approved by Senate.”

At an appropriate point, which we suggest would follow formal approval of the resolution above by the College of Medicine Executive Council, the following statement should be inserted into the university calendar under the appropriate headings for both FSS and HE. The statement will read:

“The statement below will be reported to Senate in spring of 2015

On June 24 2014, the Board of Governors, on recommendation of Senate, approved the merger of the Department of Family Social Sciences to the Department of Community Health Sciences. Accordingly, effective July 1, 2015, all associated programs in Family Social Sciences will become part of the Faculty of Health Sciences, College of Medicine, Department of Community Health Sciences.

The proposal submitted to Senate noted the need for flexibility in the implementation of this transition, which will be important as we review changes to the regulations governing the undergraduate Family Social Sciences programs during the transition period. In the interim and until such time that a review is completed and the required approval(s) received, the Family Social Sciences programs will continue to be governed by the relevant components of the Faculty of Human Ecology academic regulations and the Family Social Sciences program regulations”

As a consequence of this transitional arrangement, FSS faculty who presently service on the HE Committees that are concerned with student standing and academic progression will continue to do so after July 1, 2015 at the invitation of the Dean of the Faculty of Human Ecology. This will be of particular importance for the confirmation of graduands list for the October 2015 convocation.

cc. Jeff LeClerc, University Secretary
David Collins, Vice-Provost (Integrated Planning and Academic Programs)
Harvey Frankel, Acting Dean, Faculty of Human Ecology
Caroline Piotrowski, Head, Department of Family Social Science
Stephen Moses, Head, Department of Community Health Sciences
Neil Marnoch, Registrar

Senate Membership 2015-2016

(as of June 1, 2015)

President

David T. Barnard 2008.07.01

Chancellor

Harvey Sector 2010.01.01

Vice-Presidents

Vice-President (Academic) and Provost	Joanne Keselman	1997.01.09
Vice-President (Administration)	Paul Kochan	2012.09.17
Vice-President (External)	John Kearsey	2010.07.13
Vice-President (Research and International)	Digvir Jayas	2009.04.28

Deans of Faculties

Agricultural & Food Sciences	Karin Wittenberg	2015.01.01
Architecture	Ralph Stern	2010.09.02
Arts	Jeffery Taylor	2011.09.01
Clayton H. Riddell Faculty of Environment, Earth, and Resources	Norm Halden	2013.07.01
Education	David Mandzuk	2013.08.01
Engineering	Jonathan Beddoes	2011.07.01
Graduate Studies	Jay Doering	2005.07.01
Health Sciences	Brian Postl	2014.02.01
Human Ecology	Harvy Frankel*	2014.06.01
I.H. Asper School of Business	Michael Benarroch	2011.11.15
Kinesiology and Recreation Management	Douglas Brown	2013.09.01
Law	Lorna Turnbull	2010.05.01
Marcel A. Desautels Faculty of Music	Edmund Dawe	2007.07.01
Science	Stefi Baum	2014.10.01
Social Work	James Mulvale	2013.07.01
Director, School of Art	Paul Hess	2008.07.01
Dean, Extended Education	Gary Hepburn	2014.07.01
University Librarian	Mary-Jo Romaniuk	2014.10.01
Vice-Provost (Students)	Susan Gottheil	2010.08.15

Dentistry	Anthony Iacopino	2007.07.01
Medicine	Brian Postl	2010.07.01
Nursing	Beverly O'Connell	2012.10.15
Pharmacy	Neal Davies	2011.07.01
Rehabilitation Sciences	Emily Etcheverry	2004.06.01
University College	Jeffery Taylor*	2011.09.01

TBA
TBA

N/A

Jeremiah Kopp 2015.05.01 - 2016.04.30

TBA	2015.06.01 - 2016.05.31
TBA	2015.06.01 - 2016.05.31

Agricultural & Food Sciences	Derek Brewin	2013.06.01 – 2016.05.31
	Jared Carlberg	2013.06.01 – 2017.05.31
	Nazim Cicek	2015.06.01 – 2018.05.31
	Robert Currie	2015.06.01 – 2018.05.31
Architecture	Lisa Landrum	2012.06.01 – 2018.05.31
	Alyssa Schwann	2015.06.01 – 2018.05.31
Art, School of	Oliver Botar	2014.06.01 – 2017.05.31
Arts	Brenda Austin-Smith	2014.06.01 – 2017.05.31
	Alison Calder	2014.06.01 – 2017.05.31
	Tina Chen	2011.06.01 – 2017.05.31
	David Churchill	2015.06.01 – 2018.05.31
	Radhika Desai	2015.06.01 – 2018.05.31
	Mark Gabbert	2003.06.01 – 2018.05.31
	Mary-Anne Kandrack	2015.06.01 – 2018.05.31
	Tracey Peter	2015.06.01 – 2018.05.31
	Caterina Reitano	2015.06.01 – 2018.05.31
	Greg Sobie	2015.06.01 – 2018.05.31
	David Watt	2015.06.01 – 2018.05.31

Clayton H. Riddell Faculty of Environment, Earth and Resources	Michael Campbell	2013.06.01 – 2016.05.31
	David Walker	2015.06.01 – 2018.05.31
Education	Richard Hechter	2010.06.01 – 2016.05.31
	Thomas Falkenberg	2014.06.01 – 2017.05.31
Engineering	Witold Kinsner	2008.06.01 – 2017.05.31
	Dimos Polyzois	2005.06.01 – 2017.05.31
	BingChen Wang	2014.06.01 – 2017.05.31
	Derek Oliver	2015.06.01 – 2018.05.31
Extended Education	Cheikh Ould Moulaye	2014.06.01 – 2017.05.31
Health Sciences	Peter Cattini	2013.06.01 – 2016.05.31
	Brenda Elias	2010.06.01 – 2016.05.31
	Duane Funk	2013.06.01 – 2016.05.31
	James Gilchrist	2010.06.01 – 2016.05.31
	Alan Menkis	2013.06.01 – 2016.05.31
	Gayle Restall	2015.06.01 – 2016.05.31
	Donald Smyth	2004.06.01 – 2016.05.31
	Frank Burczynski	2013.07.01 – 2017.05.31
	Susan McClement	2014.06.01 – 2017.05.31
	Diana McMillan	2008.06.01 – 2017.05.31
	Archie McNicol	2014.06.01 – 2017.05.31
	Chris Anderson	2015.06.01 – 2018.05.31
	Raj Bhullar	2015.06.01 – 2018.05.31
	Leslie Johnson	2015.06.01 – 2018.05.31
	Sarvesh Logsetty	2015.06.01 – 2018.05.31
	Mojgan Rastegar	2015.06.01 – 2018.05.31
	Annette Schultz	2015.06.01 – 2018.05.31
	Barbara Shay	2015.06.01 – 2018.05.31
	Harminder Singh	2015.06.01 – 2018.05.31
	Robert Tate	2007.12.01 – 2018.05.31
Human Ecology	Rachel Eni	2014.09.12 – 2016.05.31
I.H. Asper School of Business	Mary Brabston	2004.06.01 – 2016.05.31
	Parshotam Dass	2014.11.21 – 2017.05.31
	Robert Biscontri (on leave)	2014.06.01 – 2017.05.31
Kinesiology and Recreation Management	Colleen Plumton	2014.06.01 – 2016.05.31
	Gordon Giesbrecht	2014.06.01 – 2017.05.31
Law	Darcy MacPherson	2013.06.01 – 2016.05.31
Libraries	Emma Popowich	2013.06.01 – 2016.05.31
	Ada Ducas	2015.06.01 – 2018.05.31
	Mayu Ishida	2015.06.01 – 2018.05.31
Marcel A. Desautels Faculty of Music	Gordon Fitzell	2014.06.01 – 2017.05.31

Science	Thomas Booth	2010.06.01 – 2016.05.31
	John Anderson	2008.06.01 – 2017.05.31
	Judith Anderson	2014.06.01 – 2017.05.31
	Philip Hultin	2011.06.01 – 2017.05.31
	Joan McConnell	2014.06.01 – 2017.05.31
	Gary Anderson	2012.06.01 – 2018.05.31
	Peter Blunden	2015.06.01 – 2018.05.31
	Mike Domaratzki	2015.06.01 – 2018.05.31
Social Work	Cathy Rocke	2013.06.01 – 2016.05.31
	Judith Hughes	2011.06.01 – 2017.05.31
Student Affairs	Jim Honeyford	2014.06.01 – 2017.05.31

Heads of Affiliated or Member Institutions

St. Andrew's College	Roman Bozyk*	2003.05.01
St. John's College	Christopher Trott	2011.07.01
St. Paul's College	Christopher Adams	2012.07.01
Université de Saint-Boniface	Gabor Csepregi	2014.07.01

Deputy Minister of Education

Deputy Minister of Education and Advanced Learning (or designate)	Gerald Farthing
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Elected by the Students (2015.04.01 – 2016.03.31)

Agricultural & Food Sciences	Quinton Watt
Architecture	Mary Furgale
Art, School of	TBA
Arts	Imreet Kaur, Allison Kilgour, Alana Robert
Clayton H. Riddell Faculty of Environment, Earth and Resources	Astitwa Thapa
Education	Julian Arcega, Alexis Prychitko
Engineering	Hunter Loewen
Graduate Studies	Kathryn Marcynuk, Hadeesha Piyadasa, Gagan Sidhu
Health Sciences:	
Dentistry/Dental Hygiene	TBA
Rehabilitation Sciences	Pamela Bachewich
Medicine	TBA
Nursing	TBA
Pharmacy	Taylor McVannel
Human Ecology	TBA
I.H. Asper School of Business	Shane O'Connor, Sohni Tappia
Kinesiology and Recreation Management	TBA
Law	Brendan Mahatoo
Marcel A. Desautels Faculty of Music	Alanna Roscoe
Science	Ryan Sherbo, Helen Teklemariam, Rebecca Van Ginkel
Social Work	Chase Rivera

Assessors

Vice-Provost (Academic Affairs)	Janice Ristock
Vice-Provost (Integrated Planning and Academic Programs)	David Collins
Associate Vice-President (Research)	Gary Glavin
Associate Vice-President (Partnerships)	James Blatz
Associate Dean of Graduate Studies	Diane Hiebert-Murphy
Associate Dean of Extended Education	Kathleen Matheos
Chair SPPC	Ada Ducas
UMFA Representative	Mark Hudson
Université de Saint-Boniface	Stéphane Dorge
Executive Director of Enrolment Services	Jeff Adams
Registrar	Neil Marnoch
Executive Director of Student Support	Don Stewart
Chair SCCCC	Greg Smith*
Vice-President UMSU	Rebecca Kunzman
President GSA	Kristjan Mann
Executive Director, Student Academic Success	Bonnie Hallman
Director of CATL	Mark Torchia
University1 Students	Oyindamola Alaka, Shira Dveris, TBA
Executive Lead, Indigenous Achievement	Deborah Young

* = acting

l/r = leave replacement

updated April 17, 2015

SCHEDULE OF MEETINGS AND AGENDA AVAILABILITY
SENATE AND SENATE EXECUTIVE COMMITTEE

Date for Items to the Secretary	Agenda to the Executive Committee	Executive Committee Meetings	Agenda available to Senate Members	Senate Meetings
May 27, 2015**	June 3, 2015	June 10, 2015	June 17, 2015	June 24, 2015
September 9, 2015	September 16, 2015	September 23, 2015	September 30, 2015	October 7, 2015
October 7, 2015	October 14, 2015	October 21, 2015*	October 28, 2015	November 4, 2015
November 4, 2015	November 12, 2015	November 18, 2015	November 25, 2015	December 2, 2015
November 25, 2015	December 2, 2015	December 9, 2015	December 16, 2015	January 6, 2016
January 6, 2016	January 13, 2016	January 20, 2016	January 27, 2016	February 3, 2016
January 27, 2016	February 3, 2016	February 10, 2016	February 24, 2016	March 2, 2016
March 9, 2016	March 16, 2016	March 23, 2016	March 30, 2016	April 6, 2016
April 20, 2016	April 27, 2016	May 4, 2016	May 11, 2016	May 18, 2016
May 25, 2015**	June 1, 2016	June 8, 2016	June 15, 2016	June 22, 2016
September 7, 2016	September 14, 2016	September 21, 2016	September 28, 2016	October 5, 2016
October 5, 2016	October 12, 2016	October 19, 2016*	October 26, 2016	November 2, 2016
November 9, 2016	November 16, 2016	November 23, 2016	November 30, 2016	December 7, 2016

1. Senate meets the end of June so that a meeting in July is not required.
2. Senate meets the third Wednesday in May to consider the list of graduands for Senate approval.
3. Senate meetings are held in the Senate Chambers, Room E3-262 EITC at 1:30 p.m.
4. Senate Executive meetings are held in the Alan A. Borger Sr. Executive Conference Room, E1-270 EITC at 1:30 p.m.
5. *Senate Executive will meet at 9:00 am on October 21, 2015 and October 19, 2016 due to Fall Convocation.
6. ** Latest date by which to submit items for June Senate agenda, where approval is required in time for the subsequent academic session.

Annual Report of the Senate Committee on Academic Computing

Preamble

The current terms of reference for the Senate Committee on Academic Computing are found on the University Governance website at:

http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/485.html

Observations

1. Members of the Committee for 2014-2015 were:

Dr. Mark Torchia (Centre for the Advancement of Teaching and Learning), Chair, Prof. Greg Bak (Arts), Dr. James Blatz (Associate Vice-President, Partnerships), Prof. Mary Brabston (Management), Mr. Sol Chu (Centre for the Advancement of Teaching and Learning), Dr. Jay Doering (Vice-Provost (Graduate Education) and Dean, Faculty of Graduate Studies), Prof. Lawrence Elliott (Health Sciences), Ms Tania Gottschalk (Libraries), Mr. Michael Langedock (Information Services and Technology), Ms Mary-Jo Romaniuk (University Librarian), Prof. Subbu Sivaramakrishnan (Management), Prof. Karen Smith (Education), Dean Ralph Stern (Architecture), Mr. Armin Hamta (student, Graduate Studies), Mr. Kenny Hong (student, University 1), Mr. Sabbir Shuvo (student, Graduate Studies), Mr. Isaac Weldon (student, Arts), Mr. Gilbert Detillieux (technical resource, Computer Science) and Ms Lynette Phye (resource, Distance and Online Education).

2. Seven meetings were held during the reporting period:

- The Committee considered several issues:
 - Technology in Research Libraries
 - Computer Back-Up and Records Management
 - Massive Open Online Courses (MOOCs)
 - Top Hat Pilot
 - Class Climate Pilot
- The Committee received updates on a number of ongoing matters and projects:
 - Blended and Online Learning Task Force Report and Recommendations
 - Student Course Registration and Delay to CLAIMID
 - Analytics/Insights addition to D2L
 - Learning Technology (Classroom Technology Project)
 - Experimental Classroom
 - JUMP (Luminus) Upgrade
 - Classroom Polling Technology
 - Non-Traditional Optical Scoring – Pilot Project
 - Learning Management System
 - IT Status

- Special presentations were provided to the Committee regarding:
 - Records Management (Karen Meelker and Rachelle Ross, Access & Privacy Office)
 - IT Governance Proposal Intake Process (Les Howard, Project Management Office)
- The Committee was charged with receiving, reviewing and vetting IT funding proposals related to teaching and learning, and with making recommendations about those proposals to the University IT Advisory Council (UITAC). To date, the Committee has received and reviewed six proposals.

Respectfully submitted,

Dr. Mark Torchia, Chair
Senate Committee on Academic Computing

Annual Report of the Senate Committee on Academic Dress

Preamble

Terms of Reference for the Senate Committee on Academic Dress can be found at:

http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/486.html

Observations

1. Committee members (2014-2015):

Prof. Paul Hess (School of Art), Chair, Prof. Lynn Chalmers (Architecture), Mr. Neil Marnoch (Registrar), Prof. Song Liu (Human Ecology), Ms Jill Bueddefeld (student, Graduate Studies), and Ms Maia Kredentser (student, Graduate Studies).
2. The Committee met once during the reporting period on May 5, 2014.
3. During this period, the Committee reported to Senate on June 25, 2014 and recommended the following:
 - a hood colour for the Master of Physical Therapy
 - a hood colour for the Interdisciplinary Health Program, Bachelor of Health Sciences and Bachelor of Health Studies
 - a hood colour for the Master of Fine Art
 - a stole colour for the Internationally Educated Agrologists Post-Baccalaureate Diploma Program

Respectfully submitted,

Professor Paul Hess, Chair
Senate Committee on Academic Dress

Annual Report of the Senate Committee on Academic Freedom

Preamble

The Terms of Reference for the Senate Committee on Academic Freedom can be found on the web at http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/488.html.

Observations

1. Committee members 2014-2015:
Mr. B. Bawdon (student, Arts), Professor R. Cardwell (Agricultural and Food Sciences), Professor J. Embree (Medicine), Mr. O. Gagne (student, Graduate Studies), Professor R. Hechter (Education), Professor C. Morrill (Management), and Dean J. Taylor (Arts)
2. The committee did not meet during the reporting period.

Respectfully submitted,
Senate Committee on Academic Freedom

Annual Report of the Senate Committee on Academic Review

Preamble

The Terms of Reference for the Senate Committee on Academic Review can be found at:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/489.htm

Observations

1. Committee members (2014-2015):
Dr. D. Collins (Vice-Provost, Integrated Planning and Academic Programs), Chair, Professor J. Anderson (Science), Professor J. Carlberg (Agricultural and Food Sciences), Mr. J. Danyluk (student, Human Ecology), Dean J. Doering (Graduate Studies), Mr. R. From (student, Graduate Studies), Professor A. MacDiarmid (Health Sciences), Professor J. Morrill (Management), Dean J. Taylor (Arts), Professor L. Wang (Science)
2. The Committee met twice during the reporting period, on November 27, 2014 and March 10, 2015.
3. During this period, the Committee reported to Senate on the following matters:
 - the establishment of a Centre for Engineering Professional Practice and Engineering Education (Senate, May 14, 2014)
 - the status of current graduate program reviews, current undergraduate program reviews, and externally accredited programs (Senate, *for information*, February 4, 2015)
4. The Committee considered Summaries of Graduate Program Reviews for graduate programs in Agribusiness and Agricultural Economics, Economics, Education (Ph.D.), English, Film, and Theatre, Entomology, Food Science, Pharmacy, Philosophy, Plant Science, Religion (Ph.D.), and Soil Science.
5. The Committee received for its consideration, Summaries of Undergraduate Program Reviews for programs in Classics, Economics, English, Film, and Theatre, and Sociology.

Respectfully submitted,

David Collins, Chair
Senate Committee on Academic Review

ANNUAL REPORT OF THE SENATE COMMITTEE ON ADMISSIONS (SCADM) FOR THE YEAR FROM MAY 1, 2014 TO APRIL 30, 2015

The terms of reference for the Senate Committee on Admissions (SCADM) are found on the University website at:

http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/490.htm

The committee membership is as follows:

<u>Incumbent</u>	<u>Position</u>	<u>Composition</u>
Ms. Susan Gottheil	Vice-Provost (Students)	(1) VP (Academic) or designate, Chair
Ms Erin Stone	Director, Admissions	(2) Vice Provost (Student Affairs) or designate
Mr. Jeff Adams	Executive Director, Enrolment Services	(3) Executive Director (Enrolment Services)
Dr. Steve Lecee	Associate Dean, Faculty of Arts	(4) Dean, Faculty of Arts or designate
Dr. M. Piercey-Normore	Associate Professor, Faculty of Science	(4) Dean, Faculty of Science or designate
Dr. John Perry	Associate Professor, Faculty of Dentistry	(4) Dean, Faculty of Dentistry or Medicine or designate
Dr. David Mandzuk	Dean, Faculty of Education	(5) Senate-appointed dean/director
Dr. Beverly O'Connell	Dean, Faculty of Nursing	(5) Senate-appointed dean/director
Dr. Gary Anderson	Associate Head, Faculty of Science	(6) Senate Appointee
Dr. Bonnie Hallman	Executive Director, Student Academic Success	(6) Senate Appointee
Dr. Nariman Sepehri	Assoc Dean, Faculty of Engineering	(6) Senate Appointee
Dr. Derek Brewin	Assoc Professor, Agricultural and Food Sciences	(6) Senate Appointee
Dr. Sarah Teetzel	Assoc Dean, Fac of Kinesiology and Rec Mgmt	(6) Senate Appointee
Dr. Ellen Judd	Professor, Faculty of Arts	(6) Senate Appointee
Mr. Dmitri Krassioukov-Enns	Student, Graduate Studies	(7) Student
Mr. Faizan Khan	Student, Graduate Studies	(7) Student
Ms. Tanjit Nagra	Student, University 1	(7) Student
Vacant (Declined)	Declined	(8) Deputy Minister of Education (or designate)
Mr. Peter Brass	University Advisor, St. John's Ravenscourt	(8) Counsellor from a Manitoba high school

Subsequent to the previous Annual Report, SCADM met on April 29, 2014, June 23, 2014, August 26, 2014, September 18, 2014, November 20, 2014, February 27, 2015, March 17, 2015.

1. Faculty of Pharmacy – SCADM reviewed a recommendation for the addition of an Adult Abuse Registry check, effective September, 2015. Endorsed by the Senate Committee on Admissions on April 29, 2014. Approved by Senate on June 25, 2014.

2. Faculty of Pharmacy – SCADM reviewed a proposal recommending the removal of Section 2 from the Special Considerations Category of the Admissions Bulletin, effective for the 2015-2016 bulletin. Endorsed by the Senate Committee on Admissions on April 29, 2014. Approved by Senate on June 25, 2014.

3. College of Nursing – SCADM reviewed a proposal recommending revisions to the non-academic admission requirements; Adult Abuse Registry Check, Respiratory Mask-Fit, effective on approval by Senate. Endorsed by the Senate Committee on Admissions on April 29, 2014. Approved by Senate on June 25, 2014.

4. College of Nursing - SCADM reviewed a proposal recommending modifications to the Special Consideration Category, effective September, 2015. Endorsed by the Senate Committee on Admissions on April 29, 2014. Approved by Senate on June 25, 2014.

5. Faculty of Engineering – SCADM reviewed a proposal regarding the creation of an Aboriginal Special Consideration Category for Engineering Access Program students, effective September 2015. Endorsed by the Senate Committee on Admissions on August 26, 2014. Approved by Senate on October 1, 2014.

6. Faculty of Engineering – SCADM reviewed a proposal recommending modifications to the existing admission regulations, effective for September, 2016. Endorsed by the Senate Committee on Admissions on September 18, 2014. Approved by Senate on November 5, 2014.

7. **Faculty of Law** – SCADM reviewed a proposal requesting changes to the first year admission process, effective September, 2015. Endorsed by the Senate Committee on Admissions on November 20, 2014. Approved by Senate on January 7, 2015.
9. **Faculty of Agricultural and Food Sciences** – SCADM reviewed a proposal recommending the addition of a special consideration admission category for the Diploma in Agriculture Program. Endorsed by the Senate Committee on Admissions on February 27, 2015. Approved by Senate on April 1, 2015.
8. **Faculty of Engineering** – SCADM reviewed a proposal recommending the renewal of the transfer program between UCSI University and the Faculty of Engineering. Endorsed by the Senate Committee on Admissions on February 27, 2015. Pending Senate approval.
10. **College of Nursing** – SCADM reviewed a proposal recommending changes for applicants to the Bachelor of Nursing Program. Endorsed by the Senate Committee on Admissions on March 17, 2015. Pending Senate approval.
11. **College of Medicine** – SCADM reviewed a proposal from the College of Medicine recommending the under-representation of individuals who come from socio-economically disadvantaged backgrounds be addressed by advantaging eligible applicants in the admissions process; effective for the 2016 intake. Pending Senate approval.
12. **College of Medicine** – SCADM reviewed a proposal from the College of Medicine recommending the number of out-of-province registrants will be reduced from 10% of the annual intake to 5% to facilitate the diversity enhancement; effective for the 2016 intake. Pending Senate approval.

Preamble

1. The terms of reference for the Senate Committee on Admissions Appeals are found at the link: http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/491.html
2. The Committee is charged to hear and determine appeals from:
 - a) decisions of faculty and school Selection Committees;
 - b) administrative decisions affecting the admission process;
 - c) decisions related to the transfer of credit policy of the faculty/school; and
 - d) the possible granting of advanced standing.
3. The Committee is to report to Senate on the determination of all appeals submitted to it; and recommend any changes in admission policies and procedures which should be considered as a result of the appeal.

Observations

1. Members of the Committee for 2014 - 2015 were: Dean D. Mandzuk, Chair (Education), Professor B. Hann, Vice-Chair (Science), Professor J. Linklater, (Music), Professor T. Janzen, (Arts), Prof. M. Domaratzki, (Science), Prof. S. Sivaramakrishnan, (I.H. Asper School of Business), Professor L. Guse, (Nursing), Professor E. Milliken, (Social Work), Professor C. Casey (Education), Mr. D. Krassioukov-Enns, (Student member - Graduate Studies), Ms. Elianna Rosenthal, (Student member - Science), Mr. A. Turnbull (Student member - President of UMSU - Ex Officio), and Ms. Erin Stone, (Director of Admissions - Ex Officio - Non-voting).
2. The Senate Committee on Admissions Appeals reports to Senate on an ongoing basis as appeals are heard. During the period from April 1, 2014 to March 31, 2015 the Committee received 2 appeals which are summarized below:

#	Faculty	Decision
1	Education	No grounds to proceed.
1	Social Work	No grounds to proceed.

Respectfully submitted,

Dr. D. Mandzuk, Chair
Senate Committee on Admission Appeals

Preamble

1. The terms of reference for the Senate Committee on Appeals are found at the link:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committes/493.html
2. The Committee is charged to hear and determine appeals from:
 - a) decisions made by academic administrators involving Senate regulations in which Faculty or School Councils have no jurisdiction; and
 - b) appeals against decisions taken by Awards Selection Committees of Faculties and Schools.
3. The Committee is to report to Senate on the determination of all appeals submitted to it; and advise the Executive Committee of any Senate regulations affecting students which appear to be creating particular difficulties.

Observations

1. Members of the Committee for 2014 - 2015 were: Dean D. Brown (Kinesiology & Recreation Management), Dean E. Dawe (Music), Dean B. O'Connell (Nursing), Professor S. Alward (School of Art, Vice-Chair), Professor P. Blunden (Science), Professor C. Enns (Education), Professor V. Swain (Dentistry), Professor D. McMillan (Nursing), Professor M. Scanlon (Agricultural and Food Sciences), Professor L. Fainstein (Law), Mr. R. Saurette (Université de Saint-Boniface), Ms. Rebecca Kunzman (Student – Designate for President of UMSU), Mr. J. Debnath (Student), Mr. A. Pawlak (Student), Mr. B. Warnakulasooriya (Student), Mr. J. Zinger (Student), and Professor A. McNicol (Graduate Studies) served as Chair.
2. The Committee reports to Senate on a regular basis and details of these reports are contained in the Senate minutes.
3. During the reporting period from April 1, 2014 to March 31, 2015 the Committee received 15 appeals which are summarized below:

#	Faculty	Decision
1	Arts	Returned to Faculty
1	I. H. Asper School of Business	Settled
1	Dentistry	No grounds
1	Engineering	No grounds
2	Extended Education	1 – Returned to Faculty 1 – No grounds
3	Graduate Studies	1 – Denied 2 – No grounds
1	Human Ecology	Denied
1	Medicine	Returned to Faculty
1	Nursing	No grounds
3	Science	1 – Granted 2 – Pending

Respectfully submitted,

Dr. A. McNicol, Chair
Senate Committee on Appeals

Annual Report of the Senate Committee on Approved Teaching Centres

Preamble

1. Terms of reference for the Senate Committee on Approved Teaching Centres can be found at: http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/494.html.

Observations

1. Committee members, 2014-2015:
Professor T. Chen (Arts), Professor R. Finnegan (Arts), Ms. R. Gaywish (Extended Education), Professor M. Glenwright (Arts), Professor J. Linden (Arts), Professor J. Montgomery (Arts), Professor L. Renee (Arts), Dean J. Taylor (Arts), Professor I. Whicher (Arts)
2. The Committee participated in two electronic meetings during the reporting period, responding to two polls; one conducted between May 26 and May 29, 2014 and the second conducted between October 2 and October 3, 2014.
3. The Committee considered the list of proposed courses and instructors as submitted by Booth University College and the Prairie Theatre Exchange for cross-registration with the University of Manitoba in 2014-2015.
4. The following are Approved Teaching Centres at the University of Manitoba:

Prairie Theatre Exchange
William and Catherine Booth College

Respectfully submitted,

Senate Committee on Approved Teaching Centres

ANNUAL REPORT TO SENATE FROM THE SENATE COMMITTEE ON AWARDS

Number of meetings

The Senate Committee on Awards met 12 times (including two electronic polls) between May 1, 2014 and April 30, 2015.

Terms of Reference

Terms of Reference for the Senate Committee on Awards can be found on the University of Manitoba website at:

http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/495.html

Committee Members

Academic Representatives:

Dr. Philip Hultin (Chair / Faculty of Science)
Dr. Laura Loewen (Vice Chair / Faculty of Music)
Prof. Darcy MacPherson (Faculty of Law)
Dr. Greg Smith (Faculty of Arts)
Dr. Wanda Chernomas (Faculty of Nursing)
Dr. Jared Carlberg (Faculty of Agricultural and Food Sciences)

Student Representatives:

Mr. Gustavo Mejicanos (Faculty of Graduate Studies)
Ms. Bingjie (Amy) Wang (College of Pharmacy) – resigned: October, 2014

Director, Financial Aid and Awards:

Ms. Jane Lastra

Vice Provost (Graduate Education) and Dean, Faculty of Graduate Studies:

Dr. Jay Doering
Ms. Rowena Krentz (alternate)

Consultants:

Mr. Jeff Adams (Executive Director, Enrolment Services)
Ms. Lesli Lucas-Aseltine (Awards Selection Coordinator, Financial Aid and Awards)
Ms. Terésa Klaassen (Awards Selection Assistant, Financial Aid and Awards – until July 2014)
Ms. Candace Préjet (Financial Aid and Awards – May, 2014)
Ms. Adrienne Domingo (Recording Secretary/Financial Aid and Awards)
Ms. Pamela Gareau (Recording Secretary/Financial Aid and Awards – as of September, 2014)
Ms. Mabelle Magsino (Financial Aid and Awards – as of October, 2014)
Ms. Mandy Laing (Financial Aid and Awards – as of November, 2014)

Observations

1. In 2014-2015, the Senate Committee on Awards approved the establishment of 75 new awards, amendments to 97 existing awards, and the withdrawal of 48 awards. Of the 75 new awards, 48 are scholarships, prizes, or fellowships, 27 are bursaries.

(Appendix A)

2. The Senate Committee on Awards recommended to Senate, for approval, 8 requests to establish awards that appear to be discriminatory under the policy on the *Non-Acceptance of Discriminatory Awards*. The awards will provide support for Aboriginal and female students.

Respectfully submitted,

Dr. Philip Hultin
Chair, Senate Committee on Awards

New Awards* Established Between May 1, 2014 and April 30, 2015 (Total = 75)

Undergraduate, Graduate, and Extended Education	Entrance Awards	Renewable Entrance Awards	In-course and Graduating Awards	Total
Undergraduate	4	2	47	53
Graduate	3	-	15	18
Undergraduate and/or Graduate and Residents	-	-	4	4
Outreach	-	-	-	75

New Undergraduate Awards* by Faculty or School, May 1, 2014 - April 30, 2015 and Historical Data for 2010-2011 through 2013-2014

Faculty or School	14-15	13-14	12-13	11-12	10-11
Agricultural & Food Sciences	2	2	2	1	2
Architecture	-	-	-	-	1
Art (Fine Arts)	-	-	1	-	-
Arts	4	5	3	3	5
Asper	7	13	8	1	10
Central [†]	15	6	6	4	7
Dentistry	2	2	1	3	3
Dental Hygiene	1	-	-	-	-
Education [°]	1	1	-	-	2
Engineering [°]	3	3	7	2	10
English Language Centre	1	1	2	-	-
Environment, Earth, & Resources	2	-	2	1	2
Extended Education	-	-	-	-	-
Human Ecology	-	-	1	-	4
Interdisciplinary	-	-	-	-	1
Kinesiology & Recreation Management	-	-	1	-	1
Law	5	3	1	2	3
Medical Rehabilitation	-	1	-	-	-
Medicine	4	4	11	18	9
Music	-	1	1	4	2
Nursing	1	-	-	-	2
Pharmacy	-	1	1	1	3
Science	3	3	-	3	6
Social Work	2	-	2	-	2
University 1	-	-	-	-	-
Totals	53	46	50	43	75

* scholarships, prizes, fellowships, and bursaries; [†] awards open to students in any faculty or school; [°] including Internationally Educated Teachers Program, Internationally Educated Engineers Qualification.

New Graduate Awards* by Area of Study, May 1, 2014 - April 30, 2015 and Historical Data for 2010-2011 through 2013-2014

Area of Study	14-15	13-14	12-13	11-12	10-11
Agricultural & Food Sciences	-	1	-	1	2
Architecture	-	-	1	-	-
Art (Fine Arts)	1	-	1	1	2
Arts	-	-	2	4	5
Central [†]	5	2	1	2	1
Dentistry	-	-	-	-	-
Education	1	-	-	-	-
Engineering	-	2	1	-	4
Environment, Earth, & Resources	-	-	2	-	-
Human Ecology	-	-	1	-	-
Interdisciplinary	1	1	-	-	3
Law	-	-	-	-	1
Management	3	-	-	2	-
Rehabilitation Sciences	2	-	-	-	-
Medicine	2	2	2	-	1
Music	-	1	-	-	1
Nursing	-	1	-	-	-
Science	3	-	-	1	2
Totals	18	10	11	11	22

* scholarships, prizes, fellowships, and bursaries; [†] awards open to students in any faculty or school.

New Awards* Open to Undergraduate and/or Graduate Students or Residents by Area of Study, May 1, 2014 - April 30, 2015 and Historical Data for 2010-2011 through 2013-2014

Area of Study	14-15	13-14	12-13	11-12	10-11
Arts	-	1	-	-	-
Central [†]	-	-	1	-	2
Environment, Earth, & Resources	2	-	-	-	-
Interdisciplinary	-	-	-	-	-
Kinesiology and Recreation Management	-	-	1	-	-
Medicine – Rehabilitation Sciences	-	-	1	-	-
Medicine – UGME & MPAS	-	1	-	-	-
Medicine - PGME	1	-	8	-	-
Science	1	-	-	-	-
Social Work	-	1	-	-	-
Totals	4	3	11	0	2

* scholarships, prizes, fellowships, and bursaries; [†] awards open to students in any faculty or school.

Annual Report of the Senate Committee on the Calendar

Preamble

1. Terms of reference for the Senate Committee on the Calendar can be found at:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/496.html

Observations

1. Committee members, 2014-2015:
Mr. J. Leclerc (University Secretary), Chair, Dean J. Doering (Chair, Senate Committee on Rules and Procedures), Professor P. Hultin (Science), Professor J. Linklater (Music), Mr. N. Marnoch (Registrar), Ms. G. Saindon (Calendar Editor), Ms. D. Vafabakhsh (student, Graduate Studies)
2. The Committee did not meet during the reporting period.

Respectfully submitted,

Jeff M. Leclerc, Chair
Senate Committee on the Calendar

Annual Report of the Senate Committee Curriculum and Course Changes

Preamble

1. Terms of reference for the Senate Committee on Curriculum and Course Changes can be found at:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/497.html

Observations

1. Committee members, 2014-2015:
Professor G. Smith (Arts), Acting Chair, Ms. S. Bannatyne (designate for Registrar), Professor A.-M. Bernier (Université de Saint-Boniface), Professor J. Carlberg (Agricultural and Food Sciences), Mr. M. Carvell (student, Law), Dr. D. Collins (Vice-Provost (Integrated Planning and Academic Programs)), Professor J. Cranston (Education), Dr. G. Csepregi (Université de Saint-Boniface), Ms. L. Demczuk (Libraries), Professor J. Hamilton (Medicine), Ms. J. Horner (Libraries), Professor D. McNeill (Engineering), Mr. K. Mann (student, Graduate Studies), Professor M. Piercey-Normore (Science), Professor B. Temple (Nursing), Mr. I. Thomson (student, Science)
2. During the reporting period, the Committee met on eleven occasions: October 9, October 15, October 16, October 27, and October 29, 2014, and February 6, March 11, March 25, March 26, April 1, and April 2, 2015. The committee also participated in three electronic polls conducted on the following dates: November 4 - 7, 2014, November 20 - 24, 2014, and April 16 - 20, 2015.
3. During this period, the Committee reported to Senate on:
 - a proposal from the Faculty of Education to revise the After-Degree Bachelor of Education program (Senate, May 14, 2014)
 - a proposal from the Faculty of Nursing to revise the Four-Year Baccalaureate of Nursing program (Senate, May 14, 2014)
 - course changes totaling less than nine credit hours from departments in various faculties, colleges, and schools (Senate, May 14, June 25, and December 3, 2014), including proposals for a Double Advanced Major in Central and East European Studies, Faculty of Arts, and a Chemistry Focus Area in Inorganic Chemistry, Faculty of Science
 - an audit of the University's academic programs (Senate, June 25, 2014)
 - changes to the COPSE approval process (Senate, June 25, 2014)
 - undergraduate course changes beyond nine credit hours RE: Department of Civil Engineering (Senate, December 3, 2014)
4. The Committee approved new and revised undergraduate curriculum and course changes forms and guidelines for completing those forms. The forms will be provided to Senate for information at its meeting on May 13, 2015.

Respectfully submitted,

Professor G. Smith, Acting Chair
Senate Committee on Curriculum and Course Changes

Annual Report of the Senate Committee on Honorary Degrees

Preamble

The terms of reference for the Senate Committee on Honorary Degrees are found online at:
http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/501.htm

Observations

1. The membership of the Committee for 2014-2015 included: Dr. David T. Barnard (President), Mr. Jeff Lieberman (President of Alumni Association), Dr. Annemieke Farenhorst (Agricultural & Food Sciences), Dean Edmund Dawe (Music), Dean Michael Benarroch (Asper School of Business), Dr. Arlene Young (Arts), Mr. Al Turnbull (President of UMSU), Ms. Susan Lewis (community representative), and Dr. Harvey Sector (Chancellor) as Chair.
2. The Committee on Honorary Degrees reports to Senate as required in closed session on candidates for honorary degrees, and the naming of buildings, parts of buildings, roadways and special units.
3. During the period from May 2014 to April 2015, the Committee reported to Senate on four occasions: May 14, 2014, December 3, 2014, January 4, 2015, and April 1, 2015. Details of these reports are available in the Office of the University Secretary (312 Administration Building) upon request by eligible members of Senate.

Respectfully submitted,

Chancellor Harvey Sector, Chair
Senate Committee on Honorary Degrees

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Annual Report of the Senate Committee on Instruction and Evaluation

Preamble:

The terms of reference for the Senate Committee on Instruction and Evaluation (SCIE) are found on the web at:

http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/502.htm

Observations:

1. Committee members, 2014-2015:
Dr. J. Ristock, Vice-Provost (Academic Affairs), Chair, Professor A. Cholakakis (Health Sciences), Dean E. Etcheverry (Health Sciences), Professor C. Frank (Arts), Mr. R. From (student, Graduate Studies), Professor T.-B. Goh (Agricultural and Food Sciences), Professor D. Hiebert-Murphy (Social Work), Professor K. Jensen (Music), Professor M. Lawall (Arts), Mr. R. Lankapalli (student, Graduate Studies), Ms. F. Lee (student, Engineering), Professor Z. Lutfiyya (Education), Mr. N. Marnoch (Registrar), Professor T. Mondor (Graduate Studies), Mr. S. Singh (student, Science), Professor E. Smirnova (Science), Dr. M. Torchia (Director, University Teaching Services), Mr. A. Turnbull (President, UMSU), Ms. B. Usick (Director, Student Advocacy and Accessibility)
2. The Committee met seven times during the reporting period on May 30, September 18, and October 28, 2014, and on January 15, February 12, March 19, and April 14, 2015.
3. During this period, the Committee reported to Senate on the following matters:
 - Revised regulations concerning First Class Honours, School of Art (Senate, June 25, 2014)
 - Revised Academic Regulations concerning the Dean's Honour Roll, Diploma in Agriculture, Faculty of Agricultural and Food Sciences (Senate, December 3, 2014)
 - Revised Entrance and Continuation Requirements, Bachelor of Arts (Honours) in Psychology, Faculty of Arts (Senate, May 14, 2014)
 - Revised Progression Rules, School of Dental Hygiene (Senate, June 25, 2014)
 - Revised Academic Regulations for the Post-Baccalaureate Diploma in Education, Faculty of Education, concerning:
 - Maximum Time Limits (Senate, March 4, 2015)
 - Transfer of Credit (Senate, March 4, 2015)
 - Revised Academic Regulations, Faculty of Engineering, concerning:
 - Limit on Time in the Preliminary Engineering Program (Senate, May 2014)
 - Students Transiting to Departments (Senate, May 14, 2014)
 - Student Progress and Academic Status (Senate, November 5, 2014)
 - Students Applying to an Engineering Program (formerly Students Transiting to Departments) (Senate, November 5, 2014)
 - Dean's Honour List (Senate, November 5, 2014)

- New and revised policies and procedures for the Postgraduate Medical Education program, College of Medicine, concerning:
 - revised FPGME Resident Assessment, Promotion, Remediation, Probation, Suspension, and Dismissal, College of Medicine (Senate, June 25, 2014)
 - establishment of a policy on Accommodation for Postgraduate Medical Residents with Disabilities, College of Medicine (Senate, November 5, 2014)
- New and revised policies and procedures for the Undergraduate Medical Education program, College of Medicine, concerning:
 - establishment of Promotion and Failure policy (Senate, June 25, 2014)
 - revised Deferred Examination policy (Senate, June 25, 2014)
 - revised Supplemental Examinations policy (Senate, June 25, 2014)
 - revised Examination Conduct policy (Senate, November 5, 2014)
 - revised Remediation policy (Senate, November 5, 2014)
- New and revised Academic Regulations for the Faculty of Science concerning:
 - revised Entrance Requirements, Bachelor of Science (Honours) in Psychology, Faculty of Science (Senate, May 14, 2014)
 - revised Entrance, Continuation, and Graduation Requirements, Bachelor of Science (Honours) in Psychology (Senate, April 1, 2015)
 - establishment of an Entrance Process for Direct Entry Students (Senate, April 1, 2015)
- Establishment of policies for the École de service social, Faculté d'éducation et des études professionnelles, Université de Saint-Boniface, concerning:
 - Field Instruction Policy (Enseignement dans le cadre d'un stage en milieu de travail) (Senate, May 14, 2014)
 - Professional Unsuitability By-law (Règlement sur l'Inaptitude Professionnelle) (Senate, June 25, 2014)
- Update from the Academic Integrity Working Group (Senate, June 25, 2014)

4. During this period, the Committee also:

- received an update from the Academic Integrity Working Group. The same update was provided to Senate on March 4, 2015
- provided advice to the Director, Centre for the Advancement of Teaching and Learning on revised terms of reference for two teaching awards, The Dr. and Mrs. H.H. Saunderson Award (for Excellence in Teaching) and the Olive Beatrice Stanton Award (for Excellence in Teaching)

Respectfully submitted,

Dr. Janice Ristock, Chair
Senate Committee on Instruction and Evaluation

April 17, 2015

Annual Report of the Joint Senate Committee on Joint Masters Programs between the University of Manitoba and the University of Winnipeg

As Chair of the Joint Senate, I am pleased to submit the following report providing the current membership and activities of the committee from May 2014 to April 17, 2015.

Membership

Chair	Joan Grace, UW
Jay Doering	Dean, Graduate Studies, UM (Ex-officio)
Designate: Todd Mondor (April 2014)	
Designate: Diane Heibert-Murphy (November 2014)	
Mavis Reimer	Dean, Graduate Studies, UW (Ex-officio)
Andrea Kailer	Graduate Studies, UM
Andrea Rounce	Arts, UM
Mark Libin	Arts, UM
Anne Caudano	History, UW
Sean Byrne	Peace and Conflict Studies, UM
Malcolm Bird	Politics, UW
Candida Rifkin	English, UW
Gurinderjit Kaila (April 2014)	Graduate Student, JMP
Beibei Lu (November 2014)	
Vacant	Graduate Student

Committee Activities during the Reporting Period

- Meetings of the Joint Senate Committee held at UW on April 22, 2014 and November 20, 2014
- JMP Religion 2nd Cycle Review – External Reviewers’ report submitted to JSC in January 2014
- Discussion of JSC Response to JMP Religion External Reviewers’ report
- Discussion and updating of the Joint Senate regulations to integrate University of Winnipeg Graduate Studies regulations
 - o JSC regulations for individual JMP programs sent to each JMP Chair for review and update

Upcoming Activities

- Chair of the Joint Senate returns to University of Manitoba
- A meeting of the Joint Senate will take place in May 2015 at UW
- The JSC continues to update the Regulations
- Upcoming 2nd cycle JMP program reviews: History and MPA

Respectfully submitted by:
Joan Grace
Chair, Joint Senate Committee
Department of Political Science
University of Winnipeg

Annual Report of the Joint Senate Committee on Master's Programs Appeals

Preamble

The Terms of Reference for the Joint Senate Committee on Master's Programs can be found on the web at:

http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/504.html

Observations

1. The Committee membership presently stands vacant until such time as the Committee is required.
2. No appeals were referred to the Committee for consideration; therefore, no meetings were held during the reporting period of May 2014 - April 2015.

Annual Report of the Senate Committee on Libraries

Preamble

1. Terms of reference for the Senate Committee on Libraries can be found at:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/505.html

Observations

1. Committee members (2014-2015):
Dr. J. Ristock, Vice-Provost (Academic Affairs), Chair, Ms. K. Adams (Libraries), Dr. J. Blatz (designate for Vice-President (Research and International)), Prof. T. Booth (Science), Ms. D. Breyfogle (Libraries), Dean D. Brown (Kinesiology and Recreation Management), Prof. D. Churchill (Arts), Mr. E. Ekine (student, Arts), Ms. P. England (student, Science), Prof. J. Gilchrist (Health Sciences), Prof. B. Hann (Graduate Studies), Prof. D. Hiebert-Murphy (Graduate Studies), Prof. R. McIlwraith (Health Sciences), Ms. P. Mehta (student, Graduate Studies), Dean J. Mulvale (Social Work), Dr. M.-J. Romaniuk (Libraries), Dr. S. Sweeney (Libraries), Ms. L. Valmestad (Libraries), Ms. L.A. Vermette (student, Graduate Studies), Prof. V. Warne (Arts)
2. The Committee met once during the reporting period, on December 12, 2014.
3. The Committee received two presentations; one on the future of libraries at the University of Manitoba and one on the changing world of library collections. The Committee also received updates on the Libraries and on acquisitions.

Respectfully submitted,

Dr. Janice Ristock, Chair
Senate Committee on the Libraries

MEMORANDUM

TO: Mr. Jeff Leclerc
University Secretary
312 Administration Building
Fort Garry Campus

FROM: Dr. Sara Israels, Assistant Dean (Academic)

DATE: April 7, 2015

**RE: ANNUAL REPORT OF THE SENATE COMMITTEE ON MEDICAL QUALIFICATIONS
MAY 2014 – APRIL 2015**



The Senate Committee on Medical Qualifications met twice, on June 11, 2014 to consider the application under Section 64 of the Medical Act for Dr. Kerstin Gerhold (Pediatrics), and on February 3, 2015 to consider 2 applications, Dr. Yoav Keynan (Internal Medicine) and Dr. Eric Sell (Pediatrics). These 3 applications were recommended to Senate and were approved.

On March 24, 2015 the SCMQ met again to review one application, Dr. Katya Rozovsky (Radiology) which was unanimously approved and a recommendation will be going forward for consideration at Senate in May.

Subsequently, Dr. Terry Klassen, Head, Department of Pediatrics has confirmed that Dr. Sell has decided not to come to the University of Manitoba. Dr. Gerhold and Dr. Keynan have taken up their faculty positions.

Members of the SCMQ are:

Dr. Sara Israels, Chair, Designate, Dean of Medicine
Dr. David Collins, Designate, Vice-President (Academic) & Provost
Dr. Anna Ziomek, appointed by the College of Physicians and Surgeons of Manitoba
Dr. Murray Enns, Faculty Member, Faculty of Medicine
Dr. M. Moffatt, Faculty Member, Faculty of Medicine
Dr. E. Cowden, Faculty Member, Faculty of Medicine

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Annual Report of the Senate Committee on Nominations

Preamble

The Terms of Reference for the Senate Committee on Nominations can be found on the University Governance website at:

http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/507.html

Observations

1. Committee members (2014-2015):

Prof. Marie Edwards (Health Sciences), Chair, Prof. Helen Cameron (Science), Dean Neal Davies (Health Sciences), Dr. Jay Doering (Graduate Studies), Prof. Gordon Fitzell (Music), Prof. Sandra Kouritzin (Education), Prof. Pam Perkins (Arts), Prof. Robert Biscontri (Management), Prof. Carla Taylor (Human Ecology), Prof. Archie McNicol (Health Sciences), Mr. Hooman Derakhshani (student, Graduate Studies), and Ms Tanjit Nagra (student, University 1).
2. The Committee met once during the reporting period on April 29, 2014, and participated in four electronic meetings during the reporting period, responding to polls conducted between June 17 and June 18, 2014, August 12 to August 15, 2014, September 18 to September 23, 2014, and December 11 to December 12, 2014.
3. The Committee reported to Senate on May 14, 2014, September 3, 2014, October 1, 2014 and January 7, 2015 to consider academic staff nominees for vacancies on standing committees of Senate.
4. Student nominees for standing committees of Senate are prepared by a special sub-committee. Lists of nominees were received from the sub-committee and recommendations were made by the Senate Committee on Nominations to Senate on June 25, 2014, September 3, 2014, October 1, 2014 and January 7, 2015.

Respectfully submitted,

Professor M. Edwards, Chair
Senate Committee on Nominations

Annual Report of the Senate Planning and Priorities Committee

Preamble

1. Terms of reference for the Senate Planning and Priorities Committee (SPPC) can be found at: http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/508.html

Observations

1. Committee members, 2014-2015:
Ms. Ada Ducas (University Libraries), Chair, Prof. Judy Anderson (Science), Dr. J. Blatz (designate for Vice-President, Research and International), Prof. M. Campbell (Environment, Earth, and Resources), Dr. D. Collins (designate for Vice-President Academic and Provost), Prof. J. Dodd (Health Sciences), Prof. M. Freund (Science), Prof. M. Gabbert (Arts), Dr. G. Glavin (designate for Vice-President, Research and International), Ms. S. Gottheil (Vice-Provost (Students)), Prof. S. Hershcovis (Management), Dr. J. Keselman (designate for President), Mr. A. Konowalchuk (designate for Vice-President (Administration)), Prof. D. Kuhn (Engineering), Ms. R. Kunzman (student, Arts), Prof. J. Owens (Arts), Prof. R. Perron (Architecture), Mr. C. Pierce (designate for President, UMSU), Ms. L. Rempel (student, Graduate Studies), Prof. A. Shalaby (Engineering), Mr. A. Turnbull (President, UMSU), Prof. F. Wang (Environment, Earth, and Resources), Prof. D. Watt (Arts)
2. The work of the Committee is carried out by three sub-committees:
Program and Curriculum Planning – Chair, Prof. J. Anderson
Campus Planning – Chair, Ms. A. Ducas
Finance Planning – Chair, Ms. A. Ducas
3. The Chair of SPPC and the members of the Finance Planning subcommittee are members of the President's Budget Advisory Committee (BAC). This committee contributes to discussion of the University Budget through a series of meetings scheduled in April 2015.
4. During the reporting period, the Senate Planning and Priorities Committee met on nine occasions: May 26, August 25, September 29, October 27, and November 24, 2014, and January 26, February 23, March 30, and April 27, 2015. The committee also participated in one electronic poll conducted February 3 – 5, 2015.
5. During this period, the Committee reported to Senate on the following matters:
 - proposal for the Department of Human Nutritional Sciences to join the Faculty of Agricultural and Food Sciences (Senate, May 14, 2014)
 - proposal from the Faculty of Education to revise the After-Degree Bachelor of Education program (Senate, May 14, 2014)
 - proposal for a Master of Social Work in Indigenous Knowledges (Senate, June 25, 2014)
 - proposal for the merger of the Department of Family Social Sciences, Faculty of Human Ecology, and the Department of Community Health Sciences, Faculty of Medicine (Senate, June 25, 2014)
 - undergraduate course changes beyond nine credit hours, Department of Civil Engineering (Senate, December 3, 2014)

- proposal for the merger of the Department of Textile Sciences, Faculty of Human Ecology, and the Department of Biosystems Engineering, Faculty of Agricultural and Food Sciences (Senate, March 4, 2015)
- establishment of an Entrance Process for Direct Entry Students, Faculty of Science (Senate, April 1, 2015)

Respectfully submitted,

Ms. A. Ducas, Chair
Senate Planning and Priorities Committee

Annual Report of the Senate Committee on Rules and Procedures

Preamble

Terms of reference for the Senate Committee on Rules and Procedures can be found at:

http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/509.html

Observations

1. Committee members (2014-2015):

Dr. Jay Doering (Vice-Provost (Graduate Education) and Dean, Graduate Studies), Chair, Prof. Archie McNicol (Graduate Studies), Prof. John Anderson (Science), Prof. Judith Owens (Arts), Ms Chido Uchime (student, Graduate Studies).

2. The Committee met once during the reporting period on October 6, 2014, and participated in electronic meetings on May 8, 2014 and February 20, 2015.

3. On November 5, 2014, the Committee reported to Senate on the following:

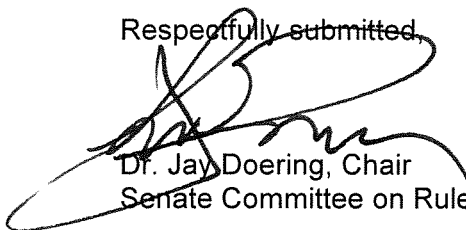
- Faculty of Health Sciences Council Bylaws
- New and Updated Governing Documents related to the Implementation of the Faculty of Health Sciences
- Faculty of Agricultural and Food Sciences Council Bylaws

4. On April 1, 2015, the Committee reported to Senate on an additional revision to the Faculty of Agricultural and Food Sciences Council Bylaws.

5. The Committee received the following for its consideration and review:

- Department of Classics Council Bylaws
- College Council Bylaw Template

Respectfully submitted,



Dr. Jay Doering, Chair
Senate Committee on Rules and Procedures

Preamble

The terms of reference for the Senate Committee on University Research (SCUR) can be found on the web at: http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/510.html

Observations

The members of the Committee during the Annual Report period of **May 2014 - April 2015** included:

- Digvir Jayas, Vice-President (Research & International), as Chair;
- David T. Barnard, President and Vice-Chancellor (Ex-Officio);
- Janice Ristock, Vice-Provost (Academic Affairs) (Ex-Officio);
- Gary Glavin, Associate Vice-President (Research) (Ex-Officio);
- James Blatz, Associate Vice-President (Partnerships) (Ex-Officio);
- Jay Doering, Dean, Faculty of Graduate Studies (Ex-Officio);
- Barbara Crutchley, Director, Office of Research Services (Ex-Officio/Non-Voting);
- Jonathan Beddoes, Dean, Faculty of Engineering;
- Paul Hess, Director, School of Art;
- Anthony Iacopino, Dean - College of Dentistry, Faculty of Health Sciences;
- James Davie, Professor, Dept. of Biochemistry and Medical Genetics, Faculty of Health Sciences;
- Gordon Fitzell, Associate Dean, Faculty of Music;
- Rick Linden, Professor, Dept. of Sociology, Faculty of Arts;
- Roberta Woodgate, Professor, College of Nursing, Faculty of Health Sciences;
- Olivier Gagne, Graduate Studies, GSA Student Rep;
- Anastasia Sizykh, Graduate Studies, GSA Student Rep

To May 31, 2014:

- Mark Whitmore, Dean, Faculty of Science;
- Robert Hoppa, Professor, Dept. of Anthropology, Faculty of Arts; (for Dr. Lea Stirling)
- Patricia Martens, Professor, Dept. of Community Health Sciences, Faculty of Health Sciences;
- Karin Wittenberg, Professor, Dept. of Animal Science, Faculty of Agricultural & Food Sciences;
- Mostafa Fayek, Professor, Dept. of Geological Sciences, Clayton H. Riddell Faculty of Environment, Earth and Resources;

As of September 04, 2014:

- Jeffery Taylor, Dean, Faculty of Arts;
- Lea Stirling, Professor, Dept. of Classics, Faculty of Arts;
- Martin Scanlon, Professor, Dept. of Food Science, Faculty of Agricultural & Food Sciences;
- Niigaanwewidam James Sinclair, Assistant Professor, Dept. of Native Studies, Faculty of Arts;
- Pawan Singal, Professor, Dept. of Physiology, Faculty of Health Sciences;

1. The Committee met **four times** during the reporting period on **May 29, 2014; September 25, 2014; December 11, 2014; and March 12, 2015**. The Committee also conducted **two (2) E-VOTES** on **November 21, 2014, and February 07, 2015**.

2. The committee reviewed and recommended to Senate for approval of the following Chairs, Professorships, and Centres/Institutes:

Establishment of:

Chairs

- Endowed Research Chair in Multiple Sclerosis (Nov 05/14; Senate)
- Convert *Professorship* in Agricultural Risk Management and Insurance *back to a Chair* (Oct 01/14; Senate)

Professorships

- Endowed Research Professorship in Hematology (Nov 05/14; Senate)
- Endowed Research Professorship in Neurosciences (Feb 04/15; Senate)

Centres and Institutes; and Research Groups

- (Proposal) Institute for Geopolitical Economy
 - Approved instead as a *Research Group* by Digvir Jayas, Vice-President (Research & International) and Chair of the Senate Committee on University Research; as per the letter of *Notification to Senate on the establishment of the Geopolitical Economy Research Group* dated January 6, 2015

5-Year Term Renewal of:

- Spinal Cord Research Centre (SCRC)
 - Effective January 01, 2015 to December 31, 2019; (Nov 05/14; Senate)

Extension to Term End Date:

- University of Manitoba Transport Institute (UMTI); original Term End Date – *December 31, 2014*
 - 6-month extension to *June 30, 2015*; (Feb 04/15; Senate)
 - A further 6-month extension to *December 31, 2015*; (Senate approval pending)

3. The Committee approved the *Membership of the Selection Committees* for:
- The Rh Awards - 2014
 - The Dr. John M. Bowman Memorial Winnipeg RH Institute Foundation Award - 2015
4. At its **September 25, 2014 SCUR Meeting**, the Committee approved the *University of Manitoba Strategic Research Plan 2014-2019 (SRP)* to be submitted to Senate for endorsement. Then via an **E-Vote on November 21, 2014**, revisions to the SRP document were approved as FINAL and the document was renamed the *University of Manitoba Strategic Research Plan 2015-2020*.

Respectfully submitted,



Digvir S. Jayas, Ph.D.
Chair, Senate Committee on University Research

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REPORT OF THE SENATE COMMITTEE ON AWARDS – PART A

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 Awards*, such offers shall be submitted to Senate for approval. (Senate, October 7, 2009)

Observations

At its meeting of March 31, 2015 the Senate Committee on Awards approved 11 new offers, 27 amended offers, and the withdrawal of four awards as set out in Appendix A of the *Report of the Senate Committee on Awards – Part A* (dated March 31, 2015).

Recommendations

On behalf of Senate, the Senate Committee on Awards recommends that the Board of Governors approve 11 new offers, 27 amended offers, and the withdrawal of four awards as set out in Appendix A (dated March 31, 2015). These award decisions comply with the published guidelines of November 3, 1999, and are reported to Senate for information.

Respectfully submitted,

Dr. Phil Hultin
Chair, Senate Committee on Awards

SENATE COMMITTEE ON AWARDS

Appendix A March 31, 2015

1. NEW OFFERS

Access and Aboriginal Focus Program Prizes

The Extended Education Endowment fund offers to support annually funded prizes totaling up to \$1,500 to students in the Access and the Aboriginal Focus Programs in the Division of Extended Education. The purpose of these prizes is to recognize students who have shown perseverance while enrolled in an Access or Aboriginal Focus program. Each year, prizes of equal value will be offered to undergraduate students who:

- (1) have completed a minimum of 18 credit hours in either an Access or Aboriginal Focus Program offered by the Division of Extended Education at the University of Manitoba in the year in which the prizes were tenable;
- (2) have achieved a minimum degree grade point average of 2.5;
- (3) have described how they have demonstrated perseverance while enrolled in an Access or Aboriginal Focus program in a written essay.

Candidates for this prize will be required to submit a written statement (maximum 250 words) demonstrating how they have persevered and overcome obstacles while enrolled in an Access or Aboriginal Focus Program.

The selection committee will have the discretion to determine the number of awards based on the available funds.

The prizes will be presented at the annual Access Graduation Celebration.

The Endowment Fund and Awards Committee will be responsible for contacting the Financial Aid and Awards office by no later than March 31 to confirm the available funds each year.

The Chair of the Endowment Funds and Awards Committee (or designate) will ask the Area Director of the Access and Aboriginal Focus Programs (or designate) to convene the selection committee for this award.

Department of Mathematics Two Year Entrance Scholarship

The Department of Mathematics in the Faculty of Science has established an annually funded scholarship supported by the proceeds from the sale of student study booklets. The purpose of the scholarship is to recruit the top graduating high school students to pursue an Honours degree program in the Department of Mathematics at the University of Manitoba.

Beginning in 2015-2016, one or more scholarships valued at \$2,500 each will be offered to undergraduate students who:

- (1) have met the Direct Entry admission requirements for the Faculty of Science at the University of Manitoba;
- (2) are enrolled full-time (minimum 80% course load) in a Bachelor of Science (B.Sc.) degree program;
- (3) has achieved a top 5 result in the province in one or more of the following math contests (in decreasing order of priority): Canadian Mathematical Olympiad (CMO) or another national Olympiad, Canadian Open Mathematics Challenge (COMC), Hypatia, Galois, Fryer, Canadian Senior and Intermediate Math contests, Euclid, Pascal, Cayley, and Fermat.

The scholarships are renewable in the second year of study, provided that the recipients:

- (1) enroll full time (minimum of 80% course load) in the Bachelor of Science Honours degree program with a declared Major in Mathematics;
- (2) have achieved a minimum degree grade point average of 3.5;
- (3) have completed the following courses offered by the Department of Mathematics: *Linear Algebra 1* (currently numbered MATH 1220), *Calculus 1* (currently numbered MATH 1230), *Calculus 2* (currently numbered MATH 1232), and *Elements of Discrete Mathematics* (currently numbered MATH 1240);
- (4) has achieved a minimum sessional grade point average of 3.75 in the courses listed in criterion (3) above in the previous academic session.

The value of the renewable scholarship will be determined based on the recipient's sessional grade point average in the following manner:

GPA	Amount
3.75 – 3.99	\$2,500
4.00 – 4.24	\$5,000
4.25 – 4.50	\$7,500

The selection committee will have the discretion to determine the number of awards based on the available funds.

The donor will notify the Financial Aid and Awards office by March 31 in any year the award is not to be offered.

The selection committee will be named by the Head of the Department of Mathematics (or designate).

Distance and Online Education Scholarships

The Extended Education Endowment Fund offers to support annually funded scholarships totaling up to \$1,500 for students taking courses provided by Distance and Online Education in the Division of Extended Education. The purpose of these scholarships is to encourage students to register for courses offered by Distance and Online Education. Each year, three scholarships of equal value will be offered to undergraduate students who:

- (1) have completed a minimum of 18 and a maximum of 36 credit hours in any school or faculty at the University of Manitoba;
- (2) have successfully completed a minimum of three (3) credit hours but not more than six (6) credit hours by Distance and Online Education at the University of Manitoba;
- (3) are enrolled in a minimum of one course (minimum three credit hours) offered by Distance and Online Education as a full-time student (minimum 80% course load) in any school or faculty at the University of Manitoba in the academic year in which the scholarship is tenable;
- (4) have achieved a minimum degree grade point average of 3.5;

Candidates will be required to submit an essay (maximum 250 words) describing their experiences while enrolled in the Distance and Online Education course(s) and show intent to enroll in further Distance and Online Education courses offered by the University of Manitoba in the next ensuing fall/winter academic session.

The selection committee will have the discretion to determine the number of awards available each year, based on the available funds.

The Endowment Fund and Awards Committee will be responsible for contacting the Financial Aid and Awards office by no later than March 31 to confirm the available funds each year.

The Chair of the Endowment Funds and Awards Committee (or designate) will ask the Area Director of the Distance and Online Education (or designate) to convene the selection committee for this award.

Earl Parker Prize

In memory of Earl Parker, Q.C., his friends established an endowment fund with an initial gift of \$10,000 in 2014. The purpose of the fund is to offer a prize for students in the Faculty of Law. Beginning in the 2016-2017 academic year, the available annual income from the fund will be used to offer one prize to an undergraduate student who:

- (1) has achieved the highest standing in the course The Art of the Deal (currently numbered LAW 3862) in the Faculty of Law at the University of Manitoba;
- (2) has achieved a minimum degree grade point average of 3.0.

In the event of a tie, the prize shall be awarded to the student with the highest standing calculated on the compulsory and elective subjects the tied students have in common.

The Dean of the Faculty of Law (or designate) shall name the selection committee for this award.

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.

Emy Ozamoto Resident Research Award for Quality Improvement

Mrs. Emy Ozamoto was the first Clinical Education Coordinator for the Department of Internal Medicine—a position she developed and held for nearly 25 years. In 2014, the Ozamoto family, as well as Emy's friends and colleagues from Internal Medicine established an endowment fund at the University of Manitoba in recognition of her dedication to the Internal Medicine Residency Program. The purpose of the award is to encourage resident research in quality improvement initiatives, which will lead to enhanced patient outcomes. Each year, beginning in 2016-2017, the available annual income from the fund will be used to offer one prize to a student who:

- (1) was enrolled full-time, in good standing, in the Post Graduate Medical Education Program in the Department of Internal Medicine in the College of Medicine, in the year in which the prize was tenable;
- (2) has presented the best quality improvement project focused on improving patient outcomes and service delivery at the Annual Department Resident Research Day.

Research projects (podium or poster presentations) will be evaluated using the following criteria:

- Abstract – 20 points
- Presentation – 50 points
- Knowledge base and preparation – 20 points
- Independence – 10 points

If warranted, and at the discretion of the selection committee, the award may be divided equally between two worthy recipients.

In the event that no residents have submitted quality improvement projects in any given year, the award will not be offered and the annual income for that year will remain in the fund.

The award recipient(s) will be announced at the annual Resident Research Dinner and the name(s) of the recipients will be engraved on the Emy Ozamoto Award plaque located on GC4 at the Health Sciences Centre.

The Dean of the College of Medicine (or designate) will ask the Resident Research Day panel of judges to act as the selection committee for this award.

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.

GAC-MAC Winnipeg 2013 Scholarship

The Organizing Committee of the Joint Annual Meeting of the Geological Association of Canada and Mineralogical Association of Canada held in Winnipeg in 2013 has established an endowment fund in the amount of \$42,200 at the University of Manitoba to recognize the contribution of the local geoscience community in hosting this successful meeting. The Manitoba Scholarship and Bursary Initiative has made a contribution to the fund. The purpose of the fund is to provide scholarships for students in the Department of Geological Sciences.

One scholarship, amounting to one-third of the available annual interest, will be awarded to an undergraduate student who:

- (1) is enrolled full-time or part-time with a declared Major in Geological Sciences in the Bachelor of Science degree program in the Clayton H. Riddell Faculty of Environment, Earth, and Resources at the University of Manitoba;
- (2) is undertaking a B.Sc. Honours thesis project or B.Sc. Major technical report project in the academic year that the scholarship is awarded;
- (3) has achieved a minimum degree grade point average of 3.5.

The undergraduate candidates will be required to submit a letter of application (maximum 500 words), which demonstrates the student's research interest in the geology and/or geophysics of Manitoba and is accompanied by the student's B.Sc. Honours thesis proposal or B.Sc. Major technical report proposal for a Manitoba project.

One scholarship, amounting to two-thirds of the available annual interest, will be awarded to a graduate student who:

- (1) is enrolled full-time in a Master's or doctoral program in the Faculty of Graduate Studies offered by the Department of Geological Sciences in the Clayton H. Riddell Faculty of Environment, Earth, and Resources;
- (2) has achieved a minimum degree grade point average of 3.5.

The graduate candidates will be required to submit a letter of application (maximum 500 words), which demonstrates the student's research interest in the geology and/or geophysics of Manitoba and is accompanied by an approved M.Sc. or Ph.D. proposal for a Manitoba project from their current degree program.

In any given year, if there are no eligible candidates who qualify for the undergraduate scholarship, the selection committee has the discretion to award that scholarship to a graduate student. Similarly, in any given year, if there are no eligible candidates who qualify for the graduate scholarship, the selection committee has the discretion to award that scholarship to an undergraduate student.

Undergraduate students may hold the undergraduate scholarship only once. Graduate students may hold the graduate scholarship only once within the M.Sc. or Ph.D. program; i.e., if a student completed all three degrees, they could potentially receive an undergraduate scholarship and two graduate scholarships.

The Vice-Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or designate) will ask the Department of Geological Sciences Awards Committee to name the selection committee.

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.

Karen Craigen Memorial Scholarship

The family and friends of Karen Craigen have established an endowment fund in her memory at the University of Manitoba. The fund will be used to offer the Karen Craigen Memorial Scholarship to students who intend to teach classroom mathematics in grades K - 12, and whose mathematical education significantly exceeds the minimum requirements of a mathematics concentration in the Bachelor of Education program. The purpose of the scholarship is to offer incentive to students to go beyond the basic standard of preparation for a career in mathematics education and to encourage and reward students who have demonstrated this initiative. Beginning in 2015-2016, the available annual interest from the fund will be used to offer one scholarship to a student who:

- (1) is enrolled in any of the following:
 - (i) full-time in the Faculty of Graduate Studies in a Master's program offered by the Department of Mathematics in the Faculty of Science;
 - (ii) full-time (minimum 80% course load) as an undergraduate student in the Faculty of Science at the University of Manitoba;
 - (iii) full-time (minimum 80% course load) as an undergraduate student in the Faculty of Arts at the University of Manitoba;
 - (iv) full-time (minimum 80% course load) as an undergraduate student in the Faculty of Education;
- (2) has completed three years of an undergraduate honours or major degree in Mathematics (or equivalent);
- (3) has achieved a minimum grade point average of 3.5 (or equivalent) in the previous 60 credit hours of study, in which 42 credit hours must be in Mathematics courses taken from the Faculty of Science;
- (4) has expressed the intention to teach classroom mathematics.

Candidates must submit a letter stating their intention to teach classroom mathematics and why they would like to pursue a career in mathematics education (maximum 250 words), along with a copy of their transcript(s).

In the event of a tie, the highest combined average will be calculated based on the students' combined average based on the best 24 credit hours. In the event that the tie persists, the degree grade point average will be used to break the tie.

A student may hold the Karen Craigen Memorial Scholarship in Mathematics Education only once in his or her lifetime.

The Vice-Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or designate), along with the Director of Financial Aid and Awards (or designate), will ask the Head of the Department of Mathematics (or designate) to name the selection committee for this award.

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.

Oscar Grubert Faculty of Law Bursary

Oscar Grubert, a 1954 graduate of the University of Manitoba Faculty of Law, made a bequest of \$50,000 in 2014 to establish an endowment fund. The purpose of the fund is to support undergraduate students in

the Faculty of Law. Each year, beginning in 2016-2017, the available annual income from the fund will be used to offer one or more bursaries to undergraduate students who:

- (1) are enrolled full-time in the Faculty of Law at the University of Manitoba;
- (2) have achieved a minimum degree grade point average of 2.0;
- (3) have demonstrated financial need on the standard University of Manitoba bursary application form.

The selection committee will have the discretion to determine the number and value of bursaries offered each year based on the available income.

The Dean of the Faculty of Law (or designate) shall name the selection committee for this award.

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.

Pawas and Mradula Verma Fellowship for Transplant Research

The Pawas and Mradula Verma Foundation (PMVF) has established the Pawas and Mradula Verma Endowment Fund (PMVEF) for Transplant Research at the University of Manitoba with an initial gift of \$100,000 in 2014. The Manitoba Scholarship and Bursary Initiative has made a matching contribution to the fund. Beginning in the 2016-2017 academic year, ninety percent (90%) of the available annual income from the fund will be used to offer one Pawas and Mradula Verma fellowship to a student who:

- (1) has obtained an undergraduate medical degree;
- (2) is enrolled full-time in either:
 - (a) the Faculty of Graduate Studies in a graduate program delivered by the College of Medicine; or
 - (b) the Postgraduate Medical Education (PGME) program as a resident or fellow;
- (3) has achieved:
 - (a) as a graduate student, a minimum grade point average of 3.5 (based on the previous 60 credit hours of study); or
 - (b) as a resident or fellow, good standing in the PGME program;
- (4) is/will be conducting a research project in the area of kidney transplant research;
- (5) has demonstrated outstanding interest or commitment to kidney transplant research.

To support criteria (4) and (5), candidates will be required to submit an application which includes the following information: (i) a current transcript(s), (ii) a *curriculum vitae*, (iii) two academic letters of reference from professors or advisors at a post-secondary institution, (iv) a description of the proposed or ongoing research (maximum 500 words) and (v) a personal statement regarding the applicant's interest in transplantation research and the role of this training in their projected career trajectory (maximum 500 words).

Recipients may hold the Pawas and Mradula Verma Fellowship for Transplant Research concurrently with any other awards, consistent with the policies in the Faculty of Graduate Studies.

The Associate Dean of the Postgraduate Medical Education program (or designate) and the Vice Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or designate) will jointly name the selection committee, which will include one member from each of the Kidney Foundation of Canada and the kidney research transplant group at the University of Manitoba. Any recipient named to receive the fellowship under (2)(a) will be reported through the Vice Provost (Graduate Education) and Dean of the Faculty of Graduate Studies.

The remaining 10% will be reinvested back into the Pawas and Mradula Verma Endowment Fund. Should there be no qualified candidate in kidney transplant research, the fellowship may be awarded to an individual engaged in liver and/or lung transplant research. Selection criteria (4) and (5) will be amended to identify applicants engaged in liver and/or lung transplant research. The selection committee will be jointly named by the Associate Dean of the Postgraduate Medical Education program (or designate) and the Vice Provost (Graduate Education) and Dean of the Faculty of Graduate Studies. In any year that there are no eligible applicants, the income will be re-capitalized into the PMVEF.

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.

Summer Session Prize

The Extended Education Endowment fund offers to support annually funded prizes totaling up to \$400 to students who have taken courses in the University of Manitoba Summer Session. The University of Manitoba Summer Session is designed to ease course loads for the Fall and Winter terms, speed up degree completion, and to provide students with the opportunity to catch up on missed courses. The purpose of these prizes is to recognize students who have taken full advantage of Summer Session course offerings in the completion of their degree. Each year, two prizes of equal value will be offered to undergraduate students who:

- (1) have met the degree requirements of their program and are graduating at the time the prize is offered;
- (2) have taken the highest number of Summer Session credit hours among all students in the respective graduating class;
- (3) have achieved the highest degree grade point average with a minimum of 3.5 from among the graduating students who have taken the highest number of Summer Session credit hours.

Recipients will be selected based on the following tie-breaking mechanisms:

- (1) highest degree grade point average from the selected group;
- (2) most "A" grades in Summer Session courses;
- (3) most "A" grades in courses taken towards degree.

Each year, one prize will be awarded to a graduating student in May; the other will be awarded to a graduating student in October. These prizes are not to be presented during the regular University of Manitoba convocation ceremony in either May or October. Recipients will be invited to the Extended Education graduation to accept the prize.

The Endowment Fund and Awards Committee will be responsible for contacting the Financial Aid and Awards office by no later than March 31 to confirm the available funds each year.

The Chair of the Endowment Funds and Awards Committee (or designate) will ask the Area Director of Summer Session (or designate) to convene the selection committee for this award.

University of Manitoba English Language Centre (ELC) Summer LEAP Program Bursary

The English Language Centre (ELC) is dedicated to teaching English for Academic Purposes (EAP) students and assisting them to enter the University of Manitoba. The Centre has established an annually funded bursary to support Canadian Permanent Residents and Landed Immigrants studying EAL in the summer Language Enrichment for Academic Preparation (LEAP) program and encourage them to continue on to pursue degree-credit studies at the University of Manitoba. Each summer, bursaries will be offered to students who:

- (1) are Canadian Permanent Residents or Landed Immigrants;

- (2) meet the requirements for, and are registered in, the summer LEAP program delivered by the ELC at the University of Manitoba;
- (3) have demonstrated financial need on the English Language Centre bursary application form as approved by the Financial Aid and Awards office at the University of Manitoba.

Applicants should note that the deadline for the ELC program deposit is postponed to the start of the program if the bursary application is presented at the time of registration.

The number and value of bursaries to be offered each summer will be determined annually by the English Language Centre.

The selection committee shall be named by the Director of the English Language Centre (or designate) and shall include at least two members of the English Language Centre.

The ELC will notify the Financial Aid and Awards office by March 31 in any year this bursary is not to be offered.

2. AMENDMENTS

Brian J. Katz Award for Best Final Paper in GMGT 2120 Business/Government Relations

The following amendments have been made to the terms of reference for the Brian J. Katz Award for Best Final Paper in GMGT 2120 Business/Government Relations:

- *The name of the award has been changed to: Brian J. Katz Prize*
- The following purpose statement was added to the opening paragraph to reflect the change in criteria:
The purpose of the fund is to provide a prize to a student who achieves the highest grade in Business and Society.
- The numbered eligibility criteria were revised to:
 - (1) *was enrolled full-time (minimum 80% course load) in the I.H. Asper School of Business at the University of Manitoba in the year in which the prize is tenable;*
 - (2) *has achieved a minimum degree grade point average of 3.0;*
 - (3) *has achieved the highest final grade in the course Business and Society (currently numbered GMGT 1010).*
- The following sentences were removed:
At the end of the Summer, Fall and the Winter Terms, every instructor of Business/Government Relations will forward to the selection committee, the name of the student who submits the best final paper in each section of the course. An instructor may nominate a maximum of two students for each course section. The papers will be forwarded to a member of the Katz family for review and comment.
- The selection committee sentence was revised to:
The Dean of the I.H. Asper School of Business (or designate) will name the selection committee for this prize.
- The following statements were added:
 - *Students who complete the course during the previous Summer, Fall and Winter Terms will be considered.*
 - *The standard Board of Governors statement.*

Catherine E. Reimer Memorial Scholarship

The following amendments have been made to the terms of reference for the Catherine E. Reimer Memorial Scholarship:

- The preamble was updated to reflect current terminology, with references to Agriculture and Human Ecology removed.
- The first scholarship was amended to be offered to an undergraduate student who:
 - (1) *is a Canadian citizen or Permanent Resident of Canada;*
 - (2) *is registered full-time (80% course load) in the Bachelor of Science (Human Nutritional Sciences) degree program, offered by the Faculty of Agricultural and Food Sciences;*
 - (3) *has achieved a minimum grade point average of 3.5 (or equivalent) based on the past 60 credit hours of study;*
- Criterion (4) was updated to reflect the current course number in Composition, Functional and Nutritional Properties of Foods (currently numbered HNSC 2150);
- The second scholarship was amended to be offered to an undergraduate student who:
 - (1) *is a Canadian citizen or Permanent Resident of Canada;*
 - (2) *is registered full-time (80% course load) in any Bachelor of Science degree program offered by the Faculty of Agricultural and Food Sciences;*
 - (3) *has achieved a minimum grade point average of 3.5 (or equivalent) based on the past 60 credit hours of study;*
- Criterion (4) was updated to reflect the current course number in Food Chemistry (currently numbered FOOD 2500);
- The selection committee sentence was revised to:
The selection committee for this scholarship will be the Faculty of Agricultural and Food Sciences Awards Committee.
- The standard Board of Governors Statement has been added.

Christina Gow Community Health Nursing Scholarship

The following amendments have been made to the terms of reference for the Christina Gow Community Health Nursing Scholarship:

- All references to the Faculty of Nursing were updated to the College of Nursing.
- “a minimum of” was added to criterion (3).
- Criterion (4) was added to include a minimum degree grade point average of 3.5.
- The application paragraph was revised to:
Eligible students will apply for this scholarship on or before the designated deadline date. Applicants will be required to submit (i) a letter of application (max 500 words) outlining how they meet the criteria listed above and (ii) one letter of reference from their academic advisor.
- The selection committee sentence was revised to:
The Vice-Provost (Graduate Education) and the Dean of the Faculty of Graduate Studies (or designate) will ask the Chair of the Curriculum Governance & Quality Assurance Committee in the College of Nursing to convene the selection committee.
- The standard Board of Governors statement was added.

D.A. Thompson Q.C. Bursaries

The following amendments have been made to the terms of reference for the D.A. Thompson Q.C. Bursaries:

- The terms were broken out of block paragraph format and revised to current formatting standards with numbered eligibility criteria.
- When offered, bursaries will be awarded to undergraduate students who:
 - (1) *are enrolled full-time in any year of the J.D. program in the Faculty of Law at the University of Manitoba;*
 - (2) *have achieved a minimum degree grade point average of 2.0, or in the case of first year students, have met the requirements for admission to the Faculty of Law and are in good academic standing;*
 - (3) *have demonstrated financial need on the standard University of Manitoba bursary application form.*
- The following statements were added:
 - *The Faculty of Law has the discretion to determine how much of the fund (held at The Winnipeg Foundation) will be used towards the D.A. Thompson Q.C. Bursaries and the D.A. Thompson Q.C. Prizes in Law.*
 - *The selection committee will have the discretion to determine the number and value of bursaries to be awarded each year.*

Darren Voetberg Memorial Award

The following amendments have been made to the terms of reference for the Darren Voetberg Memorial Award:

- *The name of the award has been changed to: Darren Voetberg Memorial Bursary.*
- The Manitoba Scholarship and Bursary Initiative statement was added to the preamble.
- The biographical information that makes up the majority of the first page has been removed from the preamble and included in a separate section to appear after the terms under the heading “Biographical Information.” This section will appear on the final draft of the terms shared with the department and donor and is not a part of the terms to be considered for approval.
- The award amount was revised to \$750.
- Criterion (1) was revised to include both third and fourth years students of the Honours or Major program in Computer Science as eligible for the award.
- Criterion (2) was revised to consider the degree grade point average, instead of cumulative.
- The preference statement was removed from the terms.
- The standard Board of Governors statement was added.

David Renfrew Petrie Memorial Medal

The following amendments have been made to the terms of reference for the David Renfrew Petrie Memorial Medal:

- The numbered eligibility criteria were revised to:
 - (1) *was enrolled full-time (minimum 80% coarse load) in the third year of the Chemistry honours program offered through the Faculty of Science at the University of Manitoba;*

- (2) *has achieved a minimum degree grade point average of 3.5;*
- (3) *has achieved the highest standing in any three chemistry courses in the past 60 credit hours of study.*
- The following statements were added:
 - *The available annual income from the fund will be used to offer one prize and a gold medal to an undergraduate student.*
 - *The selection committee will be the Department of Chemistry Awards and Scholarship committee.*
 - *The standard Board of Governors statement.*

Dr. Max Rady Memorial Bursary in Nursing

The following amendments have been made to the terms of reference for the Dr. Max Rady Memorial Bursary in Nursing:

- The name of the fund was added to the preamble.
- The terms were broken out of block paragraph format and revised to current formatting standards with numbered eligibility criteria.
- The numbered eligibility criteria state:
 - (1) *is enrolled full-time (maximum 60% course load) in the Bachelor Nursing Program in the College of Nursing at the University of Manitoba;*
 - (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 following statements were added:
 - *Each year, The Winnipeg Foundation will report the available earnings from the fund to Financial Aid and Awards at the University of Manitoba.*
 - *The selection committee shall be the Student Awards Committee of the College of Nursing.*
- The following statements were removed:
 - *The value of the bursary shall be \$500.*
 - *The bursary shall be awarded to a student enrolled in the Faculty of Nursing of the University of Manitoba and proceeding in the next ensuing academic session to a full program leading to the degree of Bachelor of Nursing of this institution.*
 - *The bursary shall be tenable with all other awards.*
 - *The first award will be made in 1966.*

Doris Marjorie Johnson Bursary in Human Ecology

The following amendments have been made to the terms of reference for the Doris Marjorie Johnson Bursary in Human Ecology:

- *The name of the award has been changed to: Doris Marjorie Johnson Bursary.*
- The amount of the gift was updated to \$100,000.
- The first paragraph was revised to reflect the purpose of the fund: supporting students in the

Human Nutritional Science degree program.

- The biographical information that makes up the majority of the first page was removed from the preamble and included in a separate section to appear after the terms under the heading “Biographical Information.” This section will appear on the final draft of the terms shared with the department and donor and is not a part of the terms to be considered for approval.
- The endowment fund will now be used to offer two bursaries at equal value based on the available income from the fund.
- Criterion (1) was revised to “*are enrolled full-time (minimum 60% course load) in any year of study in the Bachelor of Science (Human Nutritional Sciences) degree program, offered by the Faculty of Agricultural and Food Sciences at the University of Manitoba;*” replacing “in the Faculty of Human Ecology, in any year;”
- Criterion (2) was revised to consider the degree grade point average, instead of cumulative grade point average.
- The preference statement was removed.
- The selection committee sentence was revised to:
The selection committee will be the Faculty of Agricultural and Food Sciences Awards Committee.
- The standard Board of Governors Statement was added.

Frank and Donna Hruska Prize

The following amendments have been made to the terms of reference for the Frank and Donna Hruska Prize:

- The fund will now be used to support prizes for graduate students under the supervision of a staff member of the Chemistry Department.
- The fund will no longer be used to offer prizes to undergraduate students, support the purchase of books and subscriptions to scientific journals, or assist with the expenses incurred by travel to conferences and workshops.
- The numbered eligibility criteria were revised to:
Each year, one or more prizes will be offered to undergraduate students who are:
 - (1) *registered full-time in the Faculty of Graduate Studies in a Masters or Ph.D. program offered by the department of Chemistry;*
 - (2) *have achieved a minimum degree grade point average of 3.5.*
- The following statement was added:
The selection committee will have the discretion to determine the number and value of prizes to be offered each year.
- The selection committee statement was revised to:
The Vice-Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or designate) will ask the Head of the Department of Chemistry (or designate) to name the selection committee for this award.

Frosty Gold Classic Bursary in Recreation Management and Community Development

The following amendments have been made to the terms of reference for the Frosty Gold Classic Bursary in Recreation Management and Community Development:

- The preamble was revised to:
The Matthew Frost Sports Fund is an endowment fund held at The Winnipeg Foundation that was established in memory of Matthew Frost. The purpose of the fund is to provide financial support to undergraduate students pursuing their studies in Recreation Management and Community Development in the Faculty of Kinesiology and Recreation Management. Proceeds from the annual Frosty Golf Classic tournament were used to create the Frosty Golf Classic Bursary fund. Each year, The Winnipeg Foundation will report the available earnings from the fund to Financial Aid and Awards at the University of Manitoba.
- The fund will support one or more bursaries with a minimum value of \$1,000 each.
- The following statement was added:
The Winnipeg Foundation will confirm the number and value of awards to be offered each year.
- The selection committee sentence was revised to:
The selection committee will be named by the Dean of the Faculty of Kinesiology and Recreation Management (or designate).

Greene Memorial Fellowship

The following amendments have been made to the terms of reference for the Greene Memorial Fellowship:

- The eligibility criteria were revised to include graduate students in the Ph.D. in Nursing program.
- The selection committee sentence was revised to:
The Vice-Provost (Graduate Education) and the Dean of the Faculty of Graduate Studies (or designate) will ask the Head of the Department of Community Health Sciences (or designate) to name the selection committee for this award, which will include at least one representative from the College of Nursing.

Experimental Lakes Area Graduate Fellowship

The following amendments have been made to the terms of reference for the Experimental Lakes Area Graduate Fellowship:

- *The name of the award has been changed to: IISD – Experimental Lakes Area Graduate Fellowship.*
- All references to the Experimental Lakes Area were revised to the International Institute for Sustainable Development – Experimental Lakes Area (IISD-ELA).
- The available annual interest from the fund will be used to provide one or more fellowships to graduate students.
- The numbered eligibility criteria were revised to:
(1) is enrolled full-time in the Faculty of Graduate Studies in any Master's or doctoral program offered at the University of Manitoba;
(2) has achieved a minimum grade point average of 3.5 (or equivalent) based on the previous 60 credit hours of study;

- (3) *has been accepted to conduct research at the IISD-ELA;*
- (4) *has demonstrated exceptional research ability, as determined by the selection committee.*

- Required application materials were outlined in the terms.
- The selection committee sentence was revised to:

The Vice-Provost (Graduate Education) and the Dean of the Faculty of Graduate Studies (or designate) will ask the Deans of the Faculty of Science and the Clayton H. Riddell Faculty of Environment, Earth, and Resources (or designates) to name the selection committee, which will also include the Director of the IISD-ELA research unit.

- The following statements were added:
 - *Previous recipients are encouraged to apply. In addition to the required application materials provided in the previous year, past recipients must also provide a brief summary (maximum 250 words) describing the benefits of having received the IISD-Experimental Lakes Area Graduate Fellowship in the past along with an updated budget justification. This must be accompanied by a letter of support from the applicant's academic advisor.*
 - *Candidates will be assessed based on a combination of academic standing, the quality of the applicant's proposed research, and by the relevance of the proposed research to the IISD-ELA program.*
 - *The selection committee can offer to provide funds to meet some of an applicant's entire request. Award payments of equal value will be disbursed to the student's fee account at the beginning of each academic term in the year the award is tenable.*
 - *The selection committee will have the discretion to determine the number and value of fellowships offered each year based on the available funds.*
 - The standard Board of Governors statement.

Experimental Lakes Area Undergraduate Summer Award

The following amendments have been made to the terms of reference for the Experimental Lakes Area Undergraduate Summer Award:

- *The name of the award has been changed to: IISD – Experimental Lakes Area Undergraduate Research Scholarship.*
- All references to the Experimental Lakes Area were revised to the International Institute for Sustainable Development – Experimental Lakes Area (IISD-ELA).
- The available annual interest from the fund will be used to provide one or more scholarships to undergraduate students.
- The numbered eligibility criteria have been revised to:
 - (1) *have completed a minimum of one year of study as a full-time student (minimum 30 credit hours) in any school or faculty at the University of Manitoba;*
 - (2) *have achieved a minimum degree grade point average of 3.0;*
 - (3) *have applied for a research placement at the IISD-ELA and has been accepted;*
 - (4) *have declared an intention to register full-time (minimum 80% course load) in the academic session immediately following the research placement.*
- Required application materials have been outlined in the terms.

- The award payment structure was outlined in the terms.
- The selection committee sentence was revised to:
The Deans of the Faculty of Science and the Clayton H. Riddell Faculty of Environment, Earth, and Resources (or their designates) will jointly name the selection committee, which will include the Director of the IISD-ELA research unit (or designate).
- The following statements were added:
 - *Candidates will be assessed based on a combination of: academic standing, the relevance of the applicant's undergraduate field of study to the research carried out at the IISD-ELA, and the degree to which this award is critical to the applicant's ability to participate in a research placement at the IISD-ELA.*
 - *Co-op students and students who have previously received this scholarship are encouraged to apply. In addition to the required application materials listed above, past recipients must also provide a brief summary (maximum 250 words) describing the benefits of having received the IISD-ELA Undergraduate Research Scholarship in the past.*
 - *The selection committee will have the discretion to determine the number and value of scholarships offered each year based on the available funds.*
 - The standard Board of Governors statement.

Janet Fabro McComb Award

The following amendments have been made to the terms of reference for the Janet Fabro McComb Award:

- *The name of the award has been changed to: Janet Fabro McComb Scholarship*
- The opening paragraph was revised to:
An endowment fund has been established at the University of Manitoba in memory of Janet Fabro McComb (B.H.Ec/76, M.Sc./79) to support graduate students in the field of Human Nutritional Sciences. Mrs. McComb received her undergraduate as well as her graduate degree in Foods in Nutrition from the former Faculty of Human Ecology. Each year, the available annual income from this fund will be used to offer one scholarship to a graduate student who:
- The numbered eligibility criteria were revised to:
 - (1) is enrolled full-time in the Faculty of Graduate studies in the M.Sc. or Ph.D. program in Human Nutritional Sciences or the Individual Interdisciplinary Studies in Human Nutritional Sciences at the University of Manitoba;*
 - (2) has achieved a minimum degree grade point average of 3.5 (or equivalent) based on the previous 60 credit hours of study;*
 - (3) has demonstrated excellent communication skills and leadership qualities.*
- The following sentences were added:
Candidates will be required to submit a letter of reference indicating how they meet criterion (3) above. The reference letter should be written by someone in a position to objectively ascertain the communication skills and leadership qualities of the candidate (e.g. professor, supervisor, employer, etc.).
- The selection committee sentence was changed to:
The Vice-Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or

designate) will ask the Chair of the Awards Committee of the Faculty of Agricultural and Food Sciences to convene the selection committee for this award.

- The standard Board of Governors statement was added.

Katherine M.S. Middleton Scholarship

The following amendments have been made to the terms of reference for the Katherine M.S. Middleton Scholarship:

- The terms were broken out of block paragraph format and revised to current formatting standards with numbered criteria.
- The numbered eligibility criteria were revised to:
 - (1) *is a Canadian citizen or Permanent Resident;*
 - (2) *is enrolled full-time in the Faculty of Graduate Studies in the Department of Human Nutritional Sciences at the University of Manitoba;*
 - (3) *has achieved a minimum grade point average of 3.5 (or equivalent) based on the most recent 60 credit hours of study; and*
 - (4) *is carrying out research focused on food product development.*
- The following statements were added:
 - *Applicants must submit a written statement (maximum 250 words) to demonstrate how they have met criteria (4) above.*
 - *The Vice-Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or designate) will ask the Dean of the Faculty of Agricultural and Food Sciences (or designate) to name the selection committee for this award.*
- The standard Board of Governors statement.

Manitoba Ag Days Scholarship in the Faculty of Agricultural and Food Sciences

The following amendments have been made to the terms of reference for the Manitoba Ag Days Scholarship in the Faculty of Agricultural and Food Sciences:

- The following sentence was added to the preamble:

Manitoba Ag Days has established an annually funded scholarship to recognize academic achievement and community involvement by students in the Faculty of Agricultural Food Sciences at the University of Manitoba.
- The numbered eligibility criteria were revised to:
 - (1) *has completed a minimum of 24 credit hours and a maximum of 36 credit hours of university-level courses;*
 - (2) *is enrolled full-time (minimum 80% course load) in the second year of study of any undergraduate degree program offered by the Faculty of Agricultural and Food Sciences at the University of Manitoba;*
 - (3) *has achieved a minimum degree grade point average of 3.0;*
 - (4) *has demonstrated leadership in both the agriculture community and within the university.*
- The following statements were added:

- *Applicants will be required to submit a statement (maximum 500 words) outlining their involvement in the university and agriculture community, indicating how they have demonstrated leadership in these roles.*
- *The donor will contact the Financial Aid and Awards office by March 31 in any year this award will not be offered.*

Manitoba Ag Days Scholarship in the School of Agriculture

The following amendments have been made to the terms of reference for the Manitoba Ag Days Scholarship in the School of Agriculture:

- *The name of the award has been changed to: Manitoba Ag Days Convocation Prize in the School of Agriculture.*
- The following sentence was added to the preamble:
Manitoba Ag Days has established an annually funded scholarship to recognize academic achievement and community involvement by students in the School of Agriculture at the University of Manitoba.
- The numbered eligibility criteria was revised to:
 - (1) *has successfully completed the requirements for the Diploma in Agriculture at the University of Manitoba;*
 - (2) *has achieved a minimum degree grade point average of 3.0;*
 - (3) *has demonstrated community involvement and leadership in both the agriculture community and within the university.*
- The following statements was added:
 - Applicants will be required to submit a statement (maximum 500 words) outlining their involvement in the university and agriculture community, indicating how they have demonstrated leadership in these roles.
 - The donor will contact the Financial Aid and Awards office by March 31 in any year this award will not be offered.

Martin Nevile Award

The following amendments have been made to the terms of reference for the Martin Nevile Award:

- *The name of the award has been changed to: Martin Nevile Scholarship.*
- The numbered eligibility criteria were revised to:
 - (1) *is enrolled full-time (minimum 80% course load) in the fourth year of the program in the College of Dentistry in the Faculty of Health Sciences at the University of Manitoba;*
 - (2) *has attained a high academic standing in the courses Pediatric Dentistry 1 and Pediatric Dentistry 2 (currently numbered PDSD 2410 and PDSD 3412);*
 - (3) *has achieved a minimum degree grade point average of 3.5;*
 - (4) *has demonstrated (i) a high level of care and judgment in the treatment of pediatric patients, (ii) interacts well with pediatric dental patients and their parents, as well as with the academic, laboratory and support staff, and with their student peers, (iii) has the potential for, and indicates an interest in, graduate pediatric dentistry education.*
- The nomination paragraph was revised to:

Nominations are to be elicited from full-time and part-time academic faculty in the Section of Pediatric Dentistry. The letter of nomination (maximum 250 words) should explain how the nominee meets criterion (3) above.

- The selection committee sentence was revised to:

The selection committee will be the College of Dentistry Scholarship Committee with input from the Department of Preventive Dental Science (or designate) and the Section Head of Pediatric Dentistry (or designate).

- The standard Board of Governors statement has been added.

Matthew Frost Award in Recreation Management and Community Development

The following amendments have been made to the terms of reference for the Matthew Frost Award in Recreation Management and Community Development:

- The biographical information that made up the preamble has been removed and included in a separate section to appear after the terms under the heading “Biographical Information.” This section will appear on the final draft of the terms shared with the department and donor and is not a part of the terms to be considered for approval.
- A new preamble has been written and the eligibility criteria have been revised to:

The Matthew Frost Sports Fund is an endowment fund held at The Winnipeg Foundation that was established in memory of Matthew Frost. The purpose of the fund is to reward a student who has been accepted to an internship assignment offered in conjunction with the Faculty of Kinesiology and Recreation Management. Each year, The Winnipeg Foundation will report the available earnings from the fund to the Financial Aid and Awards office at the University of Manitoba. A portion of these earnings will be used to offer two scholarships with a minimum value of \$1,000 each to undergraduate students who:

 - (1) are enrolled full time (minimum 60% course load) in the Bachelor of Recreation Management and Community Development degree program in the Faculty of Kinesiology and Recreation Management at the University of Manitoba;*
 - (2) have achieved a minimum degree grade point average of 2.5 (the minimum requirement to be eligible for a supervised fieldwork experience);*
 - (3) have been accepted to participate in an internship assignment;*
 - (4) demonstrate an interest in sport management through submission of information on their accepted internship and the assigned role as it relates to a career in sport management;*
- The preference order in which to consider eligible candidates was revised to:
 - (1) have been accepted into an internship of at least three months duration offered by the Winnipeg Jets;*
 - (2) have been accepted into an internship of at least three months duration offered by another professional sports franchise;*
 - (3) have been accepted into an internship of at least three months duration offered by another amateur or national sport organization;*
 - (4) have been accepted into an internship of at least three months duration offered by Sport Manitoba, Bison Sports, or any other equivalent internship.*
- The selection committee sentence was revised to:

The selection committee will be named by the Dean of the Faculty of Kinesiology and Recreation Management (or designate), and upon selection, will advise The Winnipeg Foundation of which of the four priorities was used.

Mildred I. Lucky Bursary in Nursing

The following amendments have been made to the terms of reference for the Mildred I. Lucky Bursary in Nursing:

- The biographical information that made up a majority of the preamble has been removed and included in a separate section to appear after the terms under the heading “Biographical Information.” This section will appear on the final draft of the terms shared with the department and donor and is not a part of the terms to be considered for approval.
- The fund will be used to offer one or more bursaries.
- Criterion (1) was revised to include the definition of full-time enrolment.
- Criterion (2) was revised to consider the degree grade point average, instead of cumulative.
- The following statements were added:
 - *Each year, the number and value of the individual bursaries to be offered will be determined by the selection committee, provided each bursary covers at least 30% of the recipient’s estimated tuition, books, and lab costs.*
 - The standard Board of Governors statement.

Mildred I. Lucky Scholarship in Nursing

The following amendments have been made to the terms of reference for the Mildred I. Lucky Scholarship in Nursing:

- All references to the Baccalaureate Nursing Program were changed to the Bachelor of Nursing program.
- The numbered eligibility criteria were revised to:
 - (1) *has completed the second year of full-time study in the Bachelor of Nursing program in the College of Nursing at the University of Manitoba;*
 - (2) *is enrolled full-time (minimum 80% course load) in the third year of the Bachelor of Nursing program;*
 - (3) *has achieved a minimum degree grade point average of 3.5;*
 - (4) *has achieved a passing grade in all courses;*
 - (5) *has never failed a clinical course.*
- The following statements were added:
 - *Each year, the number and value of the individual bursaries to be offered will be determined by the selection committee, provided each bursary covers at least 30% of the recipient’s estimated tuition, books, and lab costs.*
 - The standard Board of Governors statement.

MMCF – Medicine Class of 1954 Student Bursary

The following amendments have been made to the terms of reference for the MMCF – Medicine Class of 1954 Student Bursary:

- All references to the Faculty of Medicine have been changed to the College of Medicine.
- The available earnings from the fund will be used to offer one bursary to a student in the second, third, or fourth year of the Undergraduate Medical Education Program in the College of Medicine.

Peter Letkeman Scholarship in Chemistry

The following amendments have been made to the terms of reference for the Peter Letkeman Scholarship in Chemistry:

- The biographical information that made up a majority of the preamble has been removed and included in a separate section to appear after the terms under the heading “Biographical Information.” This section will appear on the final draft of the terms shared with the department and donor and is not a part of the terms to be considered for approval.
- The numbered eligibility criteria were revised to:
 - (1) *is enrolled in a minimum of 18 credit hours in the fourth year of the honours or major chemistry program in the Faculty of Science at the University of Manitoba or is entering full-time study in the first year of a Master of Science program in Chemistry in the Faculty of Graduate Studies;*
 - (2) *has achieved a minimum cumulative grade point average of 3.5 on all courses completed to date;*
 - (3) *has achieved the highest standing in the course Instrumental Methods of Analysis (currently numbered CHEM 3590) in the academic session preceding the session in which this scholarship is tenable.*
- The selection committee sentence was revised to:

The Vice-Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or designate) will ask the Head of the Department of Chemistry (or designate) to name the selection committee for this award.
- The standard Board of Governors statement has been added.

Professional Interior Designers Institute of Manitoba Medal

The following amendments have been made to the terms of reference for the Professional Interior Designers Institute of Manitoba Medal:

- The terms were broken out of block paragraph format and revised to current formatting standards with numbered criteria.
- The numbered eligibility criteria were revised to:
 - (1) *has completed the requirements for the Master of Interior Design degree delivered by the Faculty of Architecture at the University of Manitoba;*
 - (2) *has achieved the highest academic standing (minimum degree grade point average of 3.75 based on coursework completed in the Master of Interior Design program) amongst all students who have graduated in the preceding October or February, or is eligible to graduate in the spring of the applicable academic year.*
- A tie-breaking mechanism was added.
- The following statements were added:

- *The Professional Interior Designers Institute of Manitoba will notify the Financial Aid and Awards office by no later than March 31 in any year this award is not to be offered.*
- *The Vice Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or designate) will ask the Head of the Department of Interior Design (or designate) to name the selection committee for this award.*

R.A. (Bob) Bristow Memorial Scholarship

The following amendments have been made to the terms of reference for the R.A. (Bob) Bristow Memorial Scholarship:

- Each year, the available annual interest from the fund will be used to offer one scholarship.
- The numbered eligibility criteria were revised to:
 - (1) *is enrolled full-time in the Faculty of Graduate Studies at the University of Manitoba in a Master's or Ph.D. program in a department in the Faculty of Agricultural and Food Sciences;*
 - (2) *has achieved a minimum grade point average of 3.5 in the past 60 credit hours of study;*
 - (3) *has cereal breeding as a principal field of study.*
- The selection committee sentence was revised to:

The Vice-Provost (Graduate Education) and Dean of the Faculty of Graduate Studies (or designate) will ask the Dean of the Faculty of Agricultural and Food Sciences (or designate) to name the selection committee for this award.
- The standard Board of Governors statement was added.

Ronley Award

The following amendments have been made to the terms of reference for the Ronley Award:

- *The name of the award has been changed to: Ron McCasin Bursary.*
- Criterion (3) was removed from the eligibility criteria.
- The standard Board of Governors statement was added.

Science Students' Association Honours Bursary

The following amendments have been made to the terms of reference for the Science Students' Association Honours Bursary:

- The terms were broken out of block paragraph format and revised to current formatting standards with numbered criteria.
- The available annual income from the fund will be used to offer two bursaries of equal value.
- The numbered eligibility criteria state:
 - (1) *are enrolled full-time (minimum 60 % course load) in the second year of any honours program offered through the Faculty of Science at the University of Manitoba;*
 - (2) *have achieved a minimum degree grade point average of 2.5;*
 - (3) *have demonstrated financial need on the standard University of Manitoba bursary application form.*
- The following statements were removed:

- *The bursary shall be awarded until the exhaustion of the principal and income. In the year in which the residue is less than \$500, the final award shall be made and shall consist of the entire residue.*
- *Should a student so selected not continue as specified in the next annual ensuing session at The University of Manitoba, exclusive of the affiliated colleges, the award shall revert to the next qualified candidate.*
- The selection committee sentence was revised to:
The selection committee will be named by the Dean of the Faculty of Science (or designate).
- The standard Board of Governors statement was added.

3. WITHDRAWALS

Chartered Professional Accountants – Robert Syme Memorial Scholarship

This award is being withdrawn from the University of Manitoba's awards program at the request of the donor.

Frank and Donna Hruska Prize

(Award 44136)

This award is being withdrawn from the University of Manitoba's awards program at the request of the donor.

Manrex Medication Delivery Bursary

This award is being withdrawn from the University of Manitoba's awards program at the request of the donor.

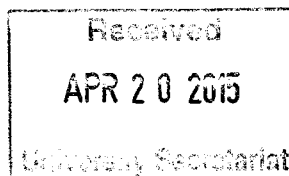
Margaret E. Miller Prize in Community Dental Health

This award is being withdrawn from the University of Manitoba's awards program at the request of the donor.



UNIVERSITY
OF MANITOBA

Office of the President



202 Administration Building
Winnipeg, MB
Canada R3T 2N2
Telephone: 204-474-9345
Fax: 204-261-1318

DATE: April 17, 2015

TO: Jeff Leclerc
University Secretary

FROM: David T. Barnard, Ph.D.
President and Vice-Chancellor

RE: Textile Sciences Graduate Program

I have received the attached request regarding the suspension of admissions in the Master of Science in Textile Sciences (M.Sc. (TS)). Under the Enrolment Limitations Policy, it is the President who approves changes to, or the introduction of, enrolment limits following consultation and discussion with the dean or director and with Senate. Prior to making a decision on this request, I would like an opportunity to present this matter to Senate for consultation.

Please place this item on the next agenda for the Senate Executive Committee and Senate.

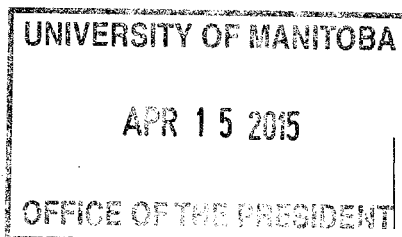
cc: Joanne Keselman, Vice-President (Academic) & Provost
David Collins, Vice-Provost (Integrated Planning and Academic Programs)
Jay Doering, Vice-Provost (Graduate Education) and Dean, Graduate Studies
Neil Marnoch, Registrar





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OF MANITOBA

Office of the Vice-President
(Academic) & Provost



208 Administration Building
Winnipeg, Manitoba
Canada R3T 2N2
Telephone (204) 480-1408
Fax (204) 275-1160

Date: April 15, 2015
To: David Barnard, President and Vice-Chancellor
From: David Collins, Vice-Provost (Integrated Planning and Academic Programs)
Subject: Textile Sciences Graduate Program

Please find attached a recommendation from Dr. John Doering, Vice-Provost (Graduate Education) and Dean (Faculty of Graduate Studies), to formally suspend admissions into the Master of Science in Textile Sciences (M.Sc. (TS)).

Following the announcement of the amalgamation of the Department of Textile Sciences and the Department of Biosystems Engineering, discussions commenced about their respective programs. Since both of the departments offer a Master's program leading to the same degree designation (M.Sc.) the amalgamation has resulted in some redundancy. Following discussions about this issue, the decision has been made to focus on-going efforts in support of the Master of Science in Biosystems Engineering, and to discontinue the M.Sc. (TS).

Therefore, in accordance with the Enrolment Limitations Policy, I am requesting that you formally suspend admissions to the M.Sc. (TS). Moving forward, new students will be admitted to the M.Sc. in Biosystems Engineering. At a later date, once students currently enrolled in the Textile Sciences program have completed their studies, a recommendation to close the M.Sc. (TS) will be forwarded for consideration to the Faculty Council of Graduate Studies.

Cc. Joanne Keselman, Vice-President (Academic) & Provost
Jay Doering, Vice-Provost (Graduate Education) and Dean, Graduate Studies
Jeff Leclerc, University Secretary
Neil Marnoch, Registrar

Report of the Senate Committee on Appeals

Preamble:

1. The terms of reference for the Senate Committee on Appeals (SCAP) are found on the web at:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committes/493.html
2. The Committee is charged to hear and determine appeals from:
 - a) decisions made by academic administrators involving Senate regulations in which Faculty or School Councils have no jurisdiction; and
 - b) appeals against decisions taken by Awards Selection Committees of Faculties and Schools.
3. The Committee is to report to Senate on the determination of all appeals submitted to it; and advise the Executive Committee of any Senate regulations affecting students which appear to be creating particular difficulties.

Observations:

1. The Committee has received 9 appeals since the last report to Senate in July 2014. These cases are summarized without compromising the confidentiality of the Appellant.
 - An appeal was received against a decision by the Faculty of Science. The grounds were failure of the Faculty/School or Dean/Director to follow procedures; failure of the Faculty/School or Dean/Director to reasonably consider all factors relevant to the decision being appealed; failure of Senate, the Faculty/School, or Dean/Director to comply with applicable legislation. The appeal was granted.
 - An appeal was received against a decision by the College of Dentistry. The grounds were failure of the Faculty/School or Dean/Director to follow procedures. The Committee determined there were no grounds to proceed to a hearing.
 - An appeal was received against a decision by Extended Education. The grounds were failure of the Faculty/School or Dean/Director to follow the rules of natural justice; failure of the Faculty/School or Dean/Director to reasonably consider all factors relevant to the decision being appealed; failure of Senate, the Faculty/School, or Dean/Director to comply with applicable legislation. The Committee determined there were no grounds to proceed to a hearing.
 - An appeal was received against a decision by the Faculty of Human Ecology. The grounds were failure of the Faculty/School or Dean/Director to reasonably consider all factors relevant to the decision being appealed. The appeal was denied.
 - An appeal was received against a decision by the Faculty of Engineering. The grounds were failure of the Faculty/School or Dean/Director to reasonably consider all factors relevant to the decision being appealed. The Committee determined there were no grounds to proceed to a hearing.
 - An appeal was received against a decision by the College of Medicine. The grounds were failure of the Faculty/School or Dean/Director to follow procedures; failure of the Faculty/School or Dean/Director to follow the rules of natural justice; and failure of the Faculty/School or Dean/Director to reasonably consider all the factors relevant to the decision being appealed. The appeal was returned, as the lower levels of appeal had not been exhausted.
 - An appeal was received against a decision by the Faculty of Graduate Studies. The grounds were failure of the Faculty/School or Dean/Director to reasonably consider all factors relevant to the decision being appealed. The Committee determined there were no grounds to proceed to a hearing.
 - An appeal was received against a decision by the Faculty of Science. The grounds were failure of the Faculty/School or Dean/Director to follow procedures; failure of the Faculty/School or Dean/Director to reasonably consider all factors relevant to the decision being appealed. The appeal was denied.

- Currently the Committee has 1 open file.

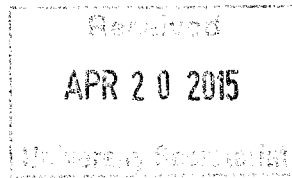
Respectfully submitted,

Dr. A. McNicol, Chair
Senate Committee on Appeals



UNIVERSITY
OF MANITOBA


Office of the President



202 Administration Building
Winnipeg, MB
Canada R3T 2N2
Telephone: 204-474-9345
Fax: 204-261-1318

DATE: April 17, 2015

TO: David Collins, Ph.D.
Vice-Provost (Integrated Planning and Academic Programs)

FROM: David T. Barnard, Ph.D.
President and Vice-Chancellor 

RE: Recommendation on Current Program Suspensions – Human Ecology

I accept your recommendation that the suspended status of the below listed programs be extended to May 2016, with review for no later than February 2016 and I would ask that you proceed accordingly.

B.H.Ecol., General Human Ecology
B.Sc. (T.S.), Product Development
B.Sc. (T.S.), Textile Development

cc: Joanne Keselman, Vice-President (Academic) & Provost
✓ Jeff Leclerc, University Secretary
Harvy Frankel, Acting Dean, Faculty of Human Ecology
Brian Postl, Dean, College of Medicine; Dean, Faculty of Health Sciences & Vice-Provost (Health Sciences)
Karin Wittenberg, Dean, Faculty of Agricultural and Food Sciences

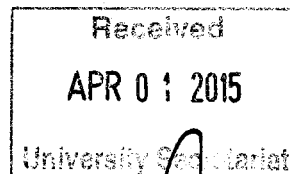




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OF MANITOBA

Office of the Vice-President
(Academic) & Provost

208 Administration Building
Winnipeg, Manitoba
Canada R3T 2N2
Telephone (204) 480-1408
Fax (204) 275-1160



Date: March 31, 2015
To: Dr. David Barnard, President and Vice-Chancellor
From: Dr. David Collins, Vice-Provost (Integrated Planning & Academic Programs)
Subject: **Recommendation on Current Program Suspensions – Human Ecology**

At its meeting of January 8, 2014, Senate was notified that admission to the following programs be suspended:

B.H.Ecol., General Human Ecology
B.Sc. (T.S.), Product Development
B.Sc. (T.S.), Textile Development

Admission was suspended to these programs from May 2013 to May 2015, with review of the status planned for February 2015.

Following consultation with Dr. Harvy Frankel, Acting Dean, Faculty of Human Ecology as well as Dr. Brian Postl, Dean and Vice-Provost (Health Sciences), Faculty of Health Sciences, [whose Faculty is currently in the process of taking over the administration of the *B.H.Ecol.* program], I recommend that the suspended status of these programs be extended to May 2016, with review for no later than February 2016. It is expected that current students will continue to register in all of these programs for the 2015-2016 academic year.

cc. Joanne Keselman, Vice-President (Academic and Provost)
Jeff Leclerc, University Secretary
Harvy Frankel, Acting Dean, Faculty of Human Ecology
Brian Postl, Dean and Vice-Provost (Health Sciences), Faculty of Health Sciences
Karin Wittenberg, Dean, Faculty of Agricultural and Food Sciences

March 10, 2015

Report of the Senate Committee on Academic Review RE: Undergraduate and Graduate Program Reviews

Preamble:

1. The Terms of Reference for the Senate Committee on Academic Review are found on the web at:
http://www.umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/489.htm
2. At its meeting on March 10, 2015, the Committee considered one summary of an undergraduate program review and received follow-up reports on six graduate program reviews.

Observations:

1. The Committee considered one summary of an undergraduate program review for Sociology.
2. The Committee received follow-up reports on six graduate program reviews, including Anthropology, Chemistry, Classics, French, Pharmacy, and Social Work.
3. The committee received an update on a pilot project to investigate the possibility of conducting joint undergraduate/graduate program reviews. The pilot project will be carried out in three departments and would be used to inform future revisions to the policy and procedures on Academic Program Reviews.

Respectfully submitted,

David Collins, Chair
Senate Committee on Academic Review

Report of the Senate Committee on Curriculum and Course Changes RE: New and Revised Undergraduate Curriculum and Course Changes Forms and Guidelines for Completion of Undergraduate / Certificate Course and Curriculum Changes (for information)

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 February 6, 2015, the committee approved new and revised undergraduate curriculum and course change forms and *Guidelines for Completion of Undergraduate / Certificate Course and Curriculum Changes*. The forms and Guidelines are provided to Senate, for information.
3. The forms and guidelines are available on the Governance webpage at
<http://umanitoba.ca/admin/governance/forms/index.html>.

Observations:

1. The SCCCC approved the following forms, to be used in the undergraduate curriculum and course change process, effective for the Fall 2015 submission deadline. The forms are PDF documents, which can be completed, edited, and saved using either Adobe Reader or Adobe Acrobat.
 - course introduction form (*revised*)
 - course modification form (*revised*)
 - course deletion form (*revised*)
 - program modification form (*new*)
 - request for statement of support form (*new*)
2. The committee also approved revised *Guidelines for Completion of Undergraduate / Certificate Course and Curriculum Changes*, which include detailed information on preparing submissions to the SCCCC (for course and curriculum changes rather than new program proposals), and which set out expectations for the format and content of the submissions, including the requirement for a summary of the proposal. Faculty and staff with responsibilities for reviewing and developing curriculum in their area and for preparing submissions to the SCCCC should familiarise themselves with the *Guidelines*.
4. The revised course introduction, modification, and deletion forms prompt units to determine and to indicate on the forms whether the course changes proposed by their unit would lead to other course or program changes in their unit or in other academic units. The forms also prompt units to consult with other departments, faculties, schools, and colleges where proposed course changes would impact courses or programs in other academic units, and to seek statements of support, where appropriate.
5. The new Program Modification Form is to be completed where course or curriculum changes being proposed by the unit or by another faculty/college/school lead to program

modifications, including, but not limited to, changes to required or elective courses in a program. A program modification form is also required where a unit proposes program modifications that do not necessarily arise from course introductions, modifications, or deletions. For example, where a program is restructured. A change to the name of a program also constitutes a program change.

6. The new Request for Statement of Support Form is to be completed when a written statement of support from other departments, faculties, colleges, or schools is required, including where:
- there is possible curricular overlap or infringement or conflict of jurisdiction;
 - a proposed curriculum or course change would affect course(s)/program(s) in another unit(s);
 - there is a request for assessment of a course that is intended to satisfy either the written English (W) requirement or the mathematics (M) requirement;
 - there is a request for a new or modified course to be assessed for inclusion on the Recommended Introductory Course (RIC) List.

Respectfully submitted,

Professor G. Smith, Acting Chair
Senate Committee on Curriculum and Course Changes

If the short course title, course number, or number of credit hours is to be changed, the current course MUST be deleted and re-introduced under the new title and/or course number and/or different credit hours.

Place the cursor over each form field for instructions. See the [Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes](#) for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School:

Department:

Subject code and Course number: *To be confirmed with Registrar before submission to SCCCC.*

Long Title:

Short Title:

Credit Hours:

Grading mode:

First term offered:

Spanned Course:

SECTION B – COURSE DESCRIPTION FOR ACADEMIC CALENDAR

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

SECTION C – RATIONALE FOR NEW COURSE

See the *Guidelines* for instructions on how to complete this section of the form.

SECTION D – REGISTRATION RESTRICTIONS

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s) (i.e. Honours). *Indicate registration restrictions in the course description.*

Faculty/college/school restrictions:

Program restrictions:

SECTION E – ADDITIONAL COURSE DETAILS

Laboratory / Field Trip Requirement:

Laboratory required: *[Indicate laboratory requirement in course description]*

Field trip required: *[Indicate field trip requirement in course description]*

Topics Courses:

This is a topics course

This course can be completed as a topics course multiple times under different titles
If “yes”, note in course description.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1:

Attach Request for Statement of Support Form(s) and responses received.

Course satisfies W requirement.

Course satisfies M requirement.

Accepted for Recommended Introductory Course List (RIC List, formerly U1 course list)

SECTION F – RESULTING CHANGES TO COURSES / PROGRAM(S)

See the *Guidelines* for instructions on how to complete this section of the form.

This course introduction leads to changes in other courses/programs in your unit. *If “Yes - Program(s)”, a Program Modification Form(s) is required.*

This course introduction leads to changes in courses/programs in other academic units. *If “yes”, a Request for Statement of Support Form(s) is required.*

List courses/programs that are affected, including courses/programs in other departments/faculties/colleges/schools.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the *Guidelines* for instructions on how to complete this section of the form. Indicate where not applicable.

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & MUTUALLY EXCLUSIVE COURSES (Information required for Aurora INB)

List all prerequisite, corequisite, prerequisite/corequisite, and mutually exclusive courses, including all applicable previous courses numbers (both Aurora and IMS course numbers). See definitions in the *Guidelines*.

Prerequisites: (MUST be taken before)

Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of “C” is assumed. A different minimum grade must be stated. Indicate where concurrency is allowed.

Pre- or Corequisites (MUST be taken either before or at the same time.)

Corequisites (MUST be taken at the same time and not be a spanned course):

Equivalent courses (Courses that could be used in place of, and are the same number of credit hours):

Mutually exclusive courses (May NOT be held with):

SECTION I – SUPPORTING DOCUMENTATION

See the *Guidelines* for information on required supporting documentation.

Course outline (required)

Library statement (normally required)

Request for Statement of Support Form(s) and statements of support

Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES

Department Approval: _____
Type Name Signature Date

Faculty/College/School Approval: _____
Type Name Signature Date



UNDERGRADUATE COURSE MODIFICATION

If the short course title or a course number is to be changed, do not use this form. The current course MUST be deleted and introduced under the new title and/or number.

Place the cursor over each form field for instructions. See Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School:

Department:

Subject code and Course number:

Current Long Title:

Revised Long Title:

Current Credit Hours:

Revised grading mode:

[Indicate pass/fail grading mode in revised course description]

Changes Take Effect:

SECTION B – MODIFIED COURSE DESCRIPTION

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form.

SECTION C – CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

SECTION D – RATIONALE FOR COURSE MODIFICATION

SECTION E – DETAILS OF PROPOSED MODIFICATION(S)

Adding registration restriction:

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). [*\[Indicate registration restrictions in the course description.\]*](#)

Faculty/college/school restrictions:

Program restrictions (eg. Honours):

Adding / Removing Laboratory / Field Trip Requirement:

Laboratory requirement:

Indicate laboratory requirement in course description]

Field trip requirement:

[Indicate field trip requirement in course description]

Written English and Mathematics Requirements, Recommended Introductory Course List for U1:

Attach Request for Statement of Support Form(s) and responses received.

Modified to satisfy the W requirement.

Modified to satisfy the M requirement.

Modified and accepted for Recommended Introductory Course List (formerly U1 course list)

SECTION F – RESULTING CHANGES TO COURSES / PROGRAM(S)

See the *Guidelines* for instructions on how to complete this section of the form.

This course modification leads to changes in courses / programs in your unit. *If “Yes - Program”, a Program Modification Form(s) is required.*

This course modification leads to changes in courses/ programs in other academic units. *If “Yes”, a Request for Statement of Support Form(s) is required.*

List courses / programs that are affected, including courses / programs in other departments/faculties/colleges/schools.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

SECTION H – MODIFICATIONS TO PREREQUISITE, COREQUISITE, PRE- OR CO-REQUISITE, & MUTUALLY EXCLUSIVE COURSES (Information required for Aurora INB)

List all prerequisite, corequisite, prerequisite/corequisite, and mutually exclusive courses, including all applicable previous courses numbers (including both Aurora and IMS course numbers).

Prerequisites: (MUST be taken before)

Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. Indicate where concurrency is allowed.

Pre- or Corequisites (MUST be taken either before or at the same time)

Corequisites (MUST be taken at the same time and not be a spanned course):

Equivalent courses (Courses that could be used in place of, and are the same number of credit hours):

Mutually exclusive courses (May NOT be held with):

SECTION I – SUPPORTING DOCUMENTATION

See the *Guidelines* for information on supporting documentation that may be required.

Course outline

Library statement

Request for Statement of Support Form(s) and statement(s) of support

Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES

Department Approval: _____
Type Name Signature Date

Faculty/College/School Approval: _____
Type Name Signature Date

UNDERGRADUATE COURSE DELETION(S)

See the [Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes](#).
Please complete additional forms, as required, where more than 3 courses are to be deleted.

SECTION A

Faculty/College/School:

Department:

SECTION B – COURSES TO BE DELETED

Subject code & Course No.:

Credit Hours:

Last term to be offered:

Long Title:

Reason for deletion:

This course is a prerequisite or corequisite for the following course(s):

This course deletion leads to changes to a course(s)/program(s) in your unit.
If “yes”, a [Program Modification Form\(s\)](#) is required. See the [Guidelines](#).

This course deletion leads to changes to a course(s)/program(s) in other units.
If “yes”, a [Request for Statement of Support Form\(s\)](#) is required. See the [Guidelines](#).

List programs affected separated by a semicolon, including programs in other academic units:

This course is on the Recommended Introductory Course List for University 1.

Subject code & Course No.:

Credit Hours:

Last term to be offered:

Long Title:

Reason for deletion:

This course is a prerequisite or corequisite for the following course(s):

This course deletion leads to changes to a course(s)/program(s) in your unit.
If “yes”, a [Program Modification Form\(s\)](#) is required. See the [Guidelines](#).

This course deletion leads to changes to a course(s)/program(s) in other units.
If “yes”, a [Request for Statement of Support Form\(s\)](#) is required. See the [Guidelines](#).

List programs affected separated by a semicolon, including programs in other academic units:

This course is on the Recommended Introductory Course List for University 1.

Last term to be offered:

Long Title:

Reason for deletion:

This course is a prerequisite or corequisite for the following course(s):

This course deletion leads to changes to a course(s)/program(s) in your unit.

If "yes", a Program Modification Form(s) is required. See the Guidelines.

This course deletion leads to changes to a course(s)/program(s) in other units. [If](#)

"yes", a Request for Statement of Support Form(s) is required. See the Guidelines.

List programs affected separated by a semicolon, including programs in other academic units:

This course is on the Recommended Introductory Course List for University 1.

SECTION C – SUPPORTING DOCUMENTATION

Request for Statement of Support Form(s) and statement(s) of support

Program Modification Form(s) – included with faculty/college/school submission to SCCC

SECTION D - SIGNATURES

Department Approval: _____

Type Name	Signature	Date
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Faculty/College/School Approval:

Type Name	Signature	Date
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See the [Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes](#).

SECTION A

Faculty/College/School:

Department:

Program:

Changes Take Effect:

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION

Provide a brief description of the proposed program modification, in prose. Limit - 200 words.

SECTION C – RATIONALE

Provide a brief rationale for the proposed program modification. Limit - 150 words.

SECTION D – ACADEMIC CALENDAR CONTENT

Attach a description of the program modification as it would appear in the Academic Calendar, including any program charts, in particular. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. ~~strikethrough~~) to indicate content that is to be deleted and **bold font** to indicate content that is to be added.

SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the *Guidelines* for instructions on how to complete this section of the form.

This program modification leads to changes in programs in other units.
If “yes”, a *Request for Statement of Support Form(s)* is required.

List programs that are affected, including programs in other faculties/colleges/schools/departments.

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the *Guidelines* for information on required supporting documentation.

Executive summary

Transition plan

Current and revised program charts and descriptions (required)

SPPC Program Proposal Budget Form

Request for Statement of Support Form(s) and statements of support

SECTION H – SIGNATURES

Department Approval: _____
Type Name Signature Date

Faculty/College/School Approval: _____
Type Name Signature Date

STATEMENT OF SUPPORT: PART A - REQUEST

Complete Sections A through D of this form and send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCCC along with Statements of Support (Part B) received. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*.

SECTION A –UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School:

Department:

SECTION B – NATURE OF REQUEST FOR SUPPORT

possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)

possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit

Request for assessment of course intended to satisfy:

W requirement

M requirement

RIC list

Request that response be provided by:

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units (including responses to requests for assessment for the W requirement, M requirement, or RIC list, if appropriate) to your faculty/college/school submission to SCCCC.

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F –UNIT REQUESTING SUPPORT

Faculty/College/School:

Department:

SECTION G – UNIT RESPONDING TO REQUEST

Faculty/College/School:

Department:

SECTION H – RESPONSE TO REQUEST

SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND NEXT STEPS

List course(s)/programs(s) in your unit that would be impacted by the course/curriculum changes being proposed, and indicate when your unit will submit corresponding changes to the SCCC for Senate approval (e.g. Fall 2015 or Spring 2016).

SECTION J – SIGNATURES

Department Approval: _____
Type Name Signature Date

Faculty/College/School Approval: _____
Type Name Signature Date



GUIDELINES FOR COMPLETION OF UNDERGRADUATE / CERTIFICATE COURSE AND CURRICULUM CHANGES*

***Course and curriculum changes refers to all course introductions, modifications, and deletions, as well as modifications to programs.**

Course/curriculum change forms are available at: <http://umanitoba.ca/admin/governance/forms/index.html>. Please ensure that you are using the most current version of Adobe Reader or Adobe Acrobat Pro when completing the forms (<https://get.adobe.com/reader/>).

Deadlines for submission - Please refer to the SCCCC Timetable for Submissions for specific dates (<http://umanitoba.ca/admin/governance/meetings/index.html>).

Fall deadlines:

- **mid-September** - for proposals involving a net increase of 9 or fewer credit hours, for consideration by the Senate Committee on Curriculum and Course Changes (SCCCC) only
- **mid-August** - for proposals involving a net increase of greater than 9 credit hours, for consideration by the Senate Planning and Priorities Committee (SPPC) and SCCCC

Spring Deadline:

- **mid-February** - for proposals involving a net increase of 9 or fewer credit hours, for consideration by the SCCCC only
(See Appendix I for examples of what is meant by a “net change in credit hours”).)

Both a hard copy and an electronic copy of the proposal must be submitted to the Office of the University Secretary. The hard copy must be single-sided original documents (i.e. no photocopies). Please do not staple. The electronic copy must be provided as a **single** PDF file (file including the summary sheet, course/curriculum change forms, and supporting documentation). PDF portfolios will not be accepted.

Faculties, colleges, and schools are strongly encouraged to consult with the Vice-Provost (Integrated Planning and Academic Programs), the Academic Specialist (Office of the University Secretary), and the University Budget Officer, as appropriate, at the outset of planning for substantial revisions to an existing program.

Information on the approval process for major amendments to, or major expansion of, an existing program is available on the webpage of the Vice-President (Academic) and Provost at http://umanitoba.ca/admin/vp_academic/academic_programs/3722.html.

I. SUMMARY OF PROPOSAL

- A **summary sheet** is to be provided with all course and curriculum changes submitted to the SCCCC. The summary sheets are to be organized by department where a faculty/college is departmentalized, and must include:
 - (a) in the following order, a list of all courses to be deleted, introduced, or modified [including subject code and course numbers (in alphabetic and ascending numerical order), course names, and credit hours];
 - (b) a statement of the net change in credit hours;
 - (c) brief descriptions of any program modifications.
- See Appendix I for examples of summary sheets.
- Changes resulting in a net increase of more than 9 credit hours will also be considered by the SPPC. Such proposals must be submitted to the Office of the University Secretary by the

mid-August deadline (see SCCCC Timetable for Submissions) and must include a statement from the Dean/Director concerning the resource implications of the proposal. The **SPPC Program Proposal Budget Form** (<http://umanitoba.ca/admin/governance/forms/index.html>) must be completed if the proposed changes involve a request for new resources.

- **Proposals to substantially modify an existing curriculum** should include, in addition:
 - (a) **an executive summary** that highlights and provides a brief rationale for important changes and clearly states when the changes are to take effect. To ensure that program changes are reflected in the Academic Calendar, program modifications will be implemented (i.e. take effect) only for the next ensuing Fall Term. Program changes cannot be implemented in the Winter Term.
 - (b) **current and revised program charts and descriptions** as they would appear in the Academic Calendar (including modifications to any list of required or elective courses in a program(s));
 - (c) **a detailed transition plan** that describes:
 - (i) a timeline for introducing the revised curriculum and phasing out the existing curriculum, including a proposed timeline for deleting any existing courses that would not form part of the revised curriculum;
 - (ii) a transition plan that includes (1) a course map (or curriculum crosswalk), (2) describes a pathway(s) for continuing/existing students to complete their program and (3) outlines future steps associated with the transition to, or the implementation of, the revised curriculum;
 - (iii) arrangements that would be made for continuing students to either complete the existing curriculum or transition to the revised curriculum;
 - (d) **consultation with other units** that might be affected by the proposed program changes, including written statements of support from those units;
 - (e) **a description of the resource implications**, including either any anticipated costs (including transitional and/or ongoing costs) that would arise from the introduction of a revised curriculum or a clear statement that the proposal is resource neutral. *The **SPPC Program Proposal Budget Form** (<http://umanitoba.ca/admin/governance/forms/index.html>) must be completed if the proposed changes involve a request for new resources.*

II. COMPLETING THE UNDERGRADUATE COURSE INTRODUCTION FORM

- Complete the course introduction form where:
 - (i) a new course is being **proposed**
 - (ii) an existing course is to be deleted and replaced for one of the following reasons:
 - a. the course is to be **renumbered**
 - b. the **credit hours are to be modified**
 - c. the **short course title (i.e. system title) is to be modified**
- To change the short course title, a course number, or the number of credit hours, the current course must be deleted and re-introduced under a new short title and/or course number, as appropriate. A course deletion form is also required. See Section IV Completing the Undergraduate Course Deletion Form.

▪ SECTION A – COURSE DETAILS

- Use the drop-down lists to indicate the **Faculty/College/School** and **Department** (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course introduction. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.
- **Subject code** (e.g. ECON, CHEM, NURS, etc.) and **Course number** Proposed subject codes and course numbers must be confirmed with the Registrar's Office (Calendar Coordinator; <http://intranet.umanitoba.ca/student/records/contact.html>) before a faculty/college/school submits its proposal for course and curriculum changes to the Office of the University Secretary for consideration by the SCCCC.
- **Long Title** (maximum 90 characters) - e.g. History of Opera I: From Monteverdi to Mozart
- **Short Title** (maximum 30 characters) – e.g. History of Opera 1
- **Credit Hours** – indicate the number of credit hours here and in the course description.
- **Grading mode** – Use the drop-down list to indicate either “letter grade” or “pass/fail”. *The course description must indicate where the grading mode is “pass fail”.*
- **First term offered** – Use the drop-down list to select the next ensuing Fall Term and Year (normally) or to request a different term. Exceptions may apply for courses to take effect in the next ensuing Summer Term. Requests for exceptions may be noted manually on the form.

▪ SECTION B – COURSE DESCRIPTION

Provide the course description exactly as it would appear in the Academic Calendar. Forms will be returned to the proposing academic unit for amendment where course descriptions are incomplete. See Appendix II for examples.

See Section II H Prerequisite, Corequisite, Pre- or Corequisite, & Mutually Exclusive Courses (below) for definitions of prerequisite, corequisite, pre- or corequisite, and mutually exclusive courses.

- In the first line, indicate the subject code, course number, long title, number of credit hours (e.g. MUSC 3230 Acoustics of Music Cr.Hrs. 3).
- For course modifications, do not indicate the past IMS course number at the beginning of a course description [i.e. (Formerly 017.336)].

- In the body of the course description, provide the following information in the order listed:
 - i. indicate where a laboratory or field trip is required [e.g. (Laboratory required)];
 - ii. a brief course description (ideally not more than 4 – 5 lines);
 - iii. mutually exclusive **and equivalent** courses prefaced by “May not be held with” and indicated by the subject code and course number and including all applicable previous course numbers **but not including IMS course numbers**; be sure to include Université de Saint Boniface course numbers where equivalency exists;
 - iv. indicate any registration restrictions (see Section II D);
 - v. indicate any prerequisite, corequisite, pre- or corequisite courses by the subject code and course number (but not the course title). Include all applicable previous course numbers **but not including** course numbers from the legacy system (e.g. 017.336). In cases where a prerequisite course is no longer offered, use the phrase “or the former” in the prerequisite list (e.g., ECON 1010 and ECON 1020 or the former ECON 1200);
 - vi. indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required [e.g. BIOL 1030 (C)];
 - vii. indicate where the course can be completed as a topics course multiple times under different titles;
 - viii. indicate where the grading mode is pass/fail.

- **SECTION C – RATIONALE FOR NEW COURSE**

Provide a brief rationale for the course introduction, including a brief explanation of how it would fit into, or contribute to, an existing or proposed curriculum. Reasons for introducing a new course might include, but are not limited to: introducing new material into a program in keeping with advances and/or changes in the foci of a particular discipline or department; accommodating the expertise of a new faculty member; division of a spanned course into two single term courses.

Indicate if the course introduction replaces a current course or is a new required or elective course that will lead to program changes in your unit (see Section II F Resulting Changes to Programs).

- **SECTION D – REGISTRATION RESTRICTIONS**

Indicate where registration is restricted to students in a particular faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s) (i.e. Honours) in the spaces provided. *Indicate registration restrictions in the course description for the Academic Calendar.* Contact the Registrar’s Office (Calendar Coordinator; <http://intranet.umanitoba.ca/student/records/contact.html>) to discuss options for restricting registration.

- **SECTION E – ADDITIONAL COURSE DETAILS**
 - **Laboratory / Field Trip Requirement** – Use the drop-down list to indicate whether a laboratory or field trip is required. *Laboratory and field trip requirements must be indicated in the course description (see Section II B and Appendix II).*

- **Topics courses** – Use the drop-down lists to indicate (i) whether the proposed course is a topics course (ii) whether a topics course can be held multiple times under different titles. *Where a topics course can be held multiple times under different titles, this must be indicated in the course description (see Section II B and Appendix II).*
- **Written English and Mathematics Requirements, Recommended Introductory Course List for U1:** Indicate where the course is intended to satisfy the Written English (W) or the Mathematics (M) requirement or is to be included on the Recommended Introductory Course (RIC) List (formerly the U1 course list). (Attach Request for Statement of Support Form(s) and responses received. See Section VI Completing the Form Request for Statement of Support.)

▪ **SECTION F – RESULTING CHANGES TO COURSES / PROGRAMS**

Indicate whether the course introduction will lead to course / program modifications in:

- (i) your academic unit (i.e. department, faculty, college or school), for example, because it will replace a current required or elective course, or because it is a new required or elective course; and/or
- (ii) any other academic unit.

If the course introduction leads to a program modification(s) in your unit, a Program Modification Form(s) must be included in your faculty/college/school submission to SCCCC (see Section V Completing the Program Modification Form). The completed form must include a brief description of the program modification(s), in prose, and be submitted together with revised program charts, lists of electives, or any other changes to Calendar content that follow from the course introduction and program modification(s).

If the course introduction leads to changes to a program(s) in another academic unit(s), list the program(s) affected and attach a Request for Statement of Support Form(s) and any responses received. See Section VI Completing the Form Request for Statement of Support.

Proposals for course introductions that would impact programs in other units, should, ***ideally***, be brought forward for the Fall deadline for SCCCC or SPPC, as appropriate. Academic units initiating such changes are **required** to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCCC for the same Fall deadline, ***ideally***, or the next ensuing Spring deadline. Please refer to the most recent Academic Calendar to identify impacted courses and programs. You can do this by completing a keyword search of the PDF version of the Calendar that is available online (<http://umanitoba.ca/calendar>). The Registrar's Office (Calendar Coordinator; <http://intranet.umanitoba.ca/student/records/contact.html>) can assist units in identifying other courses/programs affected by a proposed course introduction where an academic unit does not have this information. Please make an effort to identify impacted courses and programs before requesting RO's assistance.

▪ **SECTION G – STATEMENT OF CHANGES TO COSTS, WORKLOAD, AND/OR SUPPLIES**

Provide a statement of changes to costs if there is a change in any of the following:

- (i) workload of academic or support staff or reassignment of workload from one faculty/school to another;
- (ii) requirements for additional space, renovations to existing space or changes in the usage of space;
- (iii) costs of supplies and expenses including any specific media/technology requirements associated with the teaching of the course.

▪ **SECTION H – PREREQUISITE, COREQUISITE, PRE- OR CO-REQUISITE, & MUTUALLY EXCLUSIVE COURSES**

In the spaces provided on the form, list all prerequisite, co-requisite, pre- or corequisite, and mutually exclusive courses, including all applicable previous courses numbers (including both Aurora and IMS course numbers). Where it is necessary to list a number of courses, be explicit by using “and” and “or” statements and make use of [square brackets] to separate lists where these would provide clarity. See examples provided in Appendix II. Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required.

Use of terms:

Prerequisite course – a course that must be taken before the proposed course. A minimum grade of “C” is assumed. A different minimum grade must be stated.

Pre- or Corequisite course – where concurrency in the prerequisite course is allowed

Corequisite course – a course that must be taken at the same time as the proposed course (cannot be a spanned course)

Equivalent course – a course that could be used in place of the proposed course, based on equivalent course content, and has an equal number of credit hours

Mutually exclusive course – a course that is not to be held with the proposed course on the basis of overlapping course content

Spanned course – a course that spans the Fall and Winter Terms

▪ **SECTION I – SUPPORTING DOCUMENTATION ATTACHED**

Use the drop-down lists to indicate which supporting documents are attached to the course introduction form or included with the faculty/college/school submission to SCCC as part of a proposed Program Modification.

A **course outline** is required for most course introductions. Exceptions are sometimes allowed where the course introduction represents an existing course that is being reintroduced, for example, with a different course number or course short course title.

Course outlines are provided to the SCCC for information on the manner in which the course content set out in the course description will be delivered and evaluated. The committee recognizes that course outlines may be subject to future changes by the instructor and/or the department/faculty/college/school. See Section VII Other Supporting Documentation for information on content to be provided in the course outline for the SCCC.

A **Library statement** is normally required for a course introduction, including topics courses. A library statement may not be required for the following types of courses: studio, ensemble, clinical and other practicums, co-operative, field work, and work terms. See Section VII Other Supporting Documentation for additional information on Library statements.

▪ **SECTION J - SIGNATURES**

Print or type names and sign in the spaces provided. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/college/school involved, the form should be co-signed by the Deans/Directors of the faculties/colleges/schools involved, or a supporting statement should be provided.

III. COMPLETING THE UNDERGRADUATE COURSE MODIFICATION FORM

- The course modification form must be completed for all courses being modified.
- Course modifications include, but are not necessarily limited to, changes to the following: long course title; course description; prerequisite, corequisite, pre- or corequisite, and/or mutually exclusive courses; grading mode; registration restrictions; suitability for the written English (W) or mathematics (M) requirement, or for inclusion on the Recommended Introductory Course (RIC) List course list.
- If the short course title, the course number, or the number of credit hours is to be changed **do not use this form**. The current course MUST be deleted and introduced under the new title and/or number.

▪ SECTION A – COURSE DETAILS

- Use the drop-down lists to indicate the **Faculty/College/School** and **Department** (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course modification. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.
- Provide the **Current Long Title** (maximum 90 characters) in the space provided - e.g. *History of Opera I: From Monteverdi to Mozart*.
- Provide the **Revised Long Title** (maximum 90 characters) in the space provided where the long course title is to be modified.
- Indicate the **Current credit hours** in the space provided.
- **Revised grading mode** – Use the drop-down list to indicate whether the grading mode for the course will be changed from a standard letter grade to pass/fail or vice versa. *The course description must indicate where the grading mode is “pass fail”.*
- **Changes Take Effect** – Use the drop-down list to select the next ensuing Fall Term and Year (normally) or to request a different term. Exceptions may apply for courses to take effect in the next ensuing Summer Term. Requests for exceptions may be noted manually on the form.

• SECTION B – MODIFIED COURSE DESCRIPTION

Provide a modified course description exactly as it would appear in the Academic Calendar. Forms will be returned to the proposing faculty/college/school for amendment where course descriptions are incomplete. See Section II B for information on the format of, and information to be included in, the course description. See Appendix II for examples.

• SECTION C – CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

• SECTION D – RATIONALE FOR COURSE MODIFICATION

Provide a brief rationale for the course modification, including a brief explanation of how it might enhance or otherwise impact an existing or proposed curriculum. Reasons for modifying a course might include but are not limited to: updating material in keeping with advances and/or changes in the foci of a particular discipline or department; responding to recommendations in a program review; responding to program modifications.

- **SECTION E – DETAILS OF PROPOSED MODIFICATIONS**
 - **Adding registration restriction** – Indicate where a restriction is to be added, to restrict registration to students in a particular faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s) in the spaces provided. *Indicate registration restrictions in the modified course description.* Contact the Registrar's Office to discuss options for restricting registration.
 - **Adding /Removing Laboratory / Field Trip Requirement** – Use the drop-down lists to indicate where a laboratory / field trip requirement is either to be added or deleted. *If a laboratory /field trip requirement is added, this must be indicated in the modified course description.*
 - **Written English and Mathematics Requirements, Recommended Introductory Course List for U1:** Use the drop-down lists to indicate where a course has been modified to satisfy the Written English (W) or the Mathematics (M) requirement or is to be included on the Recommended Introductory Course List (RIC List, formerly the U1 course list). (Attach Request for Statement of Support Form(s) and responses received. See Section VI Completing the Form - Request for Statement of Support.)

▪ **SECTION F – RESULTING CHANGES TO COURSES / PROGRAM(S)**

Indicate whether the course modification will lead to course/program changes in:

- (i) your academic unit (i.e. department, faculty, college or school), for example, because it will replace a current required or elective course, or because it is a new required or elective course; and/or
- (ii) any other academic unit.

List the course(s)/program(s) in your unit that are affected.

If the course modification leads to a program modification(s) in your unit, a Program Modification Form(s) must be included in your faculty/college/school submission to SCCCC. The completed form must include a brief description of the program modification(s), in prose, and must be submitted together with revised program charts, lists of electives, or any other changes to Calendar content that follow from the course and program modification.

If the course modification leads to changes to course/ program changes in another academic unit(s), list the courses/program(s) affected and attach a Request for Statement of Support Form(s) and any responses received. See Section VI Completing the Form - Request for Statement of Support.

Proposed course modifications (including changes to pre- or corequisites) that would impact other courses/programs, including courses/programs in other units, should, **ideally**, be brought forward for the Fall deadline for SCCCC or SPPC, as appropriate. Academic units initiating such changes are **required** to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCCC for the same Fall deadline, **ideally**, or the next ensuing Spring deadline. Please refer to the most recent Academic Calendar to identify impacted courses and programs. You can do this by completing a keyword search of the PDF version of the Calendar that is available online (<http://umanitoba.ca/calendar>). The Registrar's Office (Calendar Coordinator; <http://intranet.umanitoba.ca/student/records/contact.html>) can assist units in identifying other courses/programs affected by a proposed course introduction where an academic unit does not have this information. Please make an effort to identify impacted courses and programs before requesting RO's assistance.

▪ **SECTION G – STATEMENT OF CHANGES TO COSTS, WORKLOAD, AND/OR SUPPLIES**

Provide a statement of changes to costs if there is a change in any of the following:

- Workload of academic or support staff or reassignment of workload from one faculty/school to another.
- Requirements for additional space, renovations to existing space or changes in the usage of space.
- Costs of supplies and expenses including any specific media/technology requirements associated with the teaching of the course.

▪ **SECTION H – MODIFICATIONS TO PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & MUTUALLY EXCLUSIVE COURSES**

- In the spaces provided on the form, list all prerequisite, corequisite, pre- or corequisite, and mutually exclusive courses, including all applicable previous courses numbers (including both Aurora and IMS course numbers). See page 5 for definitions.
- Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of “C” is assumed. A different minimum grade must be stated.
- Where it is necessary to list a number of courses, be explicit by using “and” and “or” statements and make use of [square brackets] to separate lists where these would provide clarity. See examples provided in Appendix II.

▪ **SECTION I – SUPPORTING DOCUMENTATION ATTACHED**

Use the drop-down lists to indicate which supporting documents are attached to the course modification form or included with the faculty/college/school submission to SCCC as part of a proposed Program Modification.

▪ **SECTION J - SIGNATURES**

Print or type names in the spaces provided and sign. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/school involved, the form should be co-signed by the Deans/Directors of the faculties/colleges/schools involved, or a supporting statement should be provided.

IV. COMPLETING THE UNDERGRADUATE COURSE DELETION FORM

- Use the course deletion form where:
 - (i) a course is to be **deleted**
 - (ii) a course is **renumbered**
 - (iii) the **credit hours are modified**
 - (iv) the **short course title is to be modified**
 - (v) the **grading mode is changed**
- To change the short course title, a course number, the number of credit hours, or the grading mode, the current course must be deleted and re-introduced under a new short title and/or course number, as appropriate. See Section II Completing the Undergraduate Course Introduction Form.
- It is not necessary to complete a separate form for each course. Three (3) course deletions can be proposed on a single form. Please complete additional forms, as required, where more than three courses are to be deleted.

SECTION A

- Use the drop-down lists to indicate the **Faculty/College/School** and **Department** (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course deletion. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.

SECTION B – COURSES TO BE DELETED

- Provide the **Subject code and Course Number** and the number of **Credit Hours** in the spaces provided.
- **Last term offered** – Use the drop-down list to select the current Winter Term and Year (normally) or to request a different term. Courses offered for the last time in a Winter Term would not be available beginning with the next ensuing Summer Term. Requests for exceptions may be noted manually on the form.
- Use the drop-down list to indicate whether the course deletion will lead to (i) course/program changes in your academic unit (i.e. department/faculty/college/school) and/or (ii) course/program changes in another faculty/college/school/department.
- List the course(s)/program(s) affected, separated by a semicolon, in the space provided.

List the course(s)/program(s) in your unit that are affected.

If the course deletion leads to a program modification(s) in your unit, a Program Modification Form(s) must be included in your faculty/college/school submission to SCCCC. The completed form must include a brief description of the program modification(s), in prose, and must be submitted together with revised program charts, lists of electives, or any other changes to Calendar content that follow from the deletion and program modification.

If the course deletion leads to a course/program modification(s) in another academic unit(s), list the course(s)/program(s) affected and attach a Request for Statement of Support Form(s) and any responses received. See Section VI Completing the Form - Request for Statement of Support.

Proposals for course deletions (including changes to pre- or corequisites) that would impact other courses/programs, including courses/programs in other units, should, **ideally**, be brought forward for the Fall deadline for SCCCC or SPPC, as appropriate. Academic units initiating such changes

are **required** to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCCC for the same Fall deadline, **ideally**, or the next ensuing Spring deadline. Please refer to the most recent Academic Calendar to identify impacted courses and programs. You can do this by completing a keyword search of the PDF version of the Calendar that is available online (<http://umanitoba.ca/calendar>). The Registrar's Office (Calendar Coordinator; <http://intranet.umanitoba.ca/student/records/contact.html>) can assist units in identifying other courses/programs affected by a proposed course introduction where an academic unit does not have this information. Please make an effort to identify impacted courses and programs before requesting RO's assistance.

- **SECTION C – SUPPORTING DOCUMENTATION ATTACHED**

Use the drop-down lists to indicate which supporting documents are attached to the course deletion form or included with the faculty/college/school submission to SCCCC as part of a proposed Program Modification.

- **SECTION D - SIGNATURES**

Print or type names and sign in the spaces provided. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/school involved, the form should be co-signed by the Deans/Directors of the faculties/schools involved, or a supporting statement should be provided.

V. COMPLETING THE UNDERGRADUATE PROGRAM MODIFICATION FORM

- A program modification form must be completed where course or curriculum changes proposed by your unit or by another faculty/college/school lead to a program modification(s) in your unit, including but not limited to, changes to lists of required or elective courses in a program(s).
- A program modification form is also required where a unit proposes program modifications that do not necessarily arise from course introductions/modifications/deletions. For example, where a program is restructured or the credit hour system is revised, resulting in changes to credit hours for a large number of courses.
- A change to the name of a program constitutes a program modification.

NB: Information on the approval process for **major amendments** to, or **major expansion** of, an existing program is available on the webpage of the Vice-President (Academic) and Provost at http://umanitoba.ca/admin/vp_academic/academic_programs/3722.html. Information on additional documentation required for proposals for major amendments to, or major expansion of, an existing program can be found on page 2 of these Guidelines.

Faculties, colleges, and schools are strongly encouraged to consult with the Vice-Provost (Integrated Planning and Academic Programs), the Academic Specialist (Office of the University Secretary), and the University Budget Officer, as appropriate, at the outset of planning for substantial revisions to an existing program.

SECTION A – FACULTY/COLLEGE/SCHOOL AND DEPARTMENT

- Use the drop-down lists to indicate the **Faculty/College/School** and **Department** (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course introduction. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.
- Provide the name of the program in the space provided. Please be specific [e.g. B.Sc. in Agriculture; B.Sc. in Engineering (Civil); B.Sc. (Hons.) in Physics and Astronomy – Astronomy (Option A)]
- **Changes Take Effect** – Use the drop-down list to select the next ensuing Fall Term and Year (normally) or to request a different term. Requests for exceptions may be noted manually on the form.

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION

Provide a brief description of the proposed program modification, in prose, for the program(s) in your faculty/college/school. Include the same description on the summary sheet to be included at the beginning of the submission to SCCCC. (Limit – 200 words)

Where significant changes to a program are proposed, describe what arrangements will be made for the students affected by the transition to a new program structure.

SECTION C – RATIONALE

Provide a brief rationale for the proposed program modification. (Limit- 150 words)

▪ **SECTION D – ACADEMIC CALENDAR CONTENT**

Attach a description of the program modification as it would appear in the current Academic Calendar, including any program charts, in particular. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. ~~strikethrough~~) to indicate content that is to be deleted and **bold font** to indicate content that is to be added. See Appendix III for examples.

▪ **SECTION E – STATEMENT OF CHANGES TO COSTS, WORKLOAD, AND/OR SUPPLIES**

Provide a statement of changes to costs if there is a change in any of the following:

- Workload of academic or support staff or reassignment of workload from one faculty/school to another.
- Requirements for additional space, renovations to existing space or changes in the usage of space.
- Costs of supplies and expenses including any specific media/technology requirements associated with the teaching of the course.

*The **SPPC Program Proposal Budget Form** must be completed if the proposed changes involve a request for new resources.* (<http://umanitoba.ca/admin/governance/forms/index.html>)

▪ **SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES**

Indicate whether the proposed program modification leads to program modifications in another academic unit(s). List the program(s) affected and attach a Request for Statement of Support Form(s). See Section VI Completing the Form - Request for Statement of Support.

Proposals for program modifications that would impact other programs, including courses/programs in other units, should, **ideally**, be brought forward for the Fall deadline for SCCC or SPPC, as appropriate. Academic units initiating such changes are **required** to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCC for the same Fall deadline, **ideally**, or the next ensuing Spring deadline. Please refer to the most recent Academic Calendar to identify impacted courses and programs. You can do this by completing a keyword search of the PDF version of the Calendar that is available online (<http://umanitoba.ca/calendar>). The Registrar's Office (Calendar Coordinator; <http://intranet.umanitoba.ca/student/records/contact.html>) can assist units in identifying other courses/programs affected by a proposed course introduction where an academic unit does not have this information. Please make an effort to identify impacted courses and programs before requesting RO's assistance.

▪ **SECTION G – SUPPORTING DOCUMENTATION ATTACHED**

Use the drop-down lists to indicate which supporting documents are attached to the Program Modification Form.

▪ **SECTION H – SIGNATURES**

Print or type names and sign in the spaces provided. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/college/school involved, the form should be co-signed by the Deans/Directors of the faculties/colleges/schools involved, or a supporting statement should be provided.

VI. COMPLETING THE FORM - REQUEST FOR STATEMENT OF SUPPORT

- A written statement of support from other departments/faculties/colleges/schools is required for curriculum or course changes (including program proposals) where:
 - there is possible curricular overlap or infringement or conflict of jurisdiction;
 - a course(s)/program(s) in another unit(s) would be affected by a proposed curriculum or course change in your unit;
 - there is a request for assessment of a course that is intended to satisfy either the written English (W) requirement or the mathematics (M) requirement (See Section VII Other Supporting Documentation);
 - there is a request for a new or modified course to be assessed for inclusion on the Recommended Introductory Course (RIC) List (See Section VII Other Supporting Documentation).
- Part A (Sections A through D) and Part B (Section F) of the form are to be completed by the unit requesting a statement(s) of support. A copy of the form, with these sections completed, is to be provided to each unit(s) from which a statement of support is sought, along with any supporting documentation that might be required.
- One copy of the completed form (Part A – Sections A through D) plus any statements of support received from the other units (Part B – Sections F through J) are to be submitted with your faculty/college/school's submission to SCCCC.
- **SECTION A**
 - Use the drop-down lists to indicate the **Faculty/College/School** and **Department** (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course modification. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.

▪ **SECTION B – NATURE OF REQUEST FOR SUPPORT**

Check the appropriate box to indicate whether the request for a statement of support relates to:

- possible curricular overlap or infringement or conflict of jurisdiction;
- possible course/program changes in another unit(s) arising from proposed course/program changes in your unit;
- a request for assessment of a course intended to satisfy the W requirement, the M requirement, inclusion on the RIC list (see below).

Specify the date by which your unit requires a response from the other unit(s). Units requesting a statement of support should allow a minimum of four (4) weeks for the other unit(s) to respond. The absence of a response should not be understood to be an indication of support.

Written English (W) and mathematics (M) requirements: Proposals for new and modified courses intended to satisfy the written English (W) or the mathematics (M) requirement must be reviewed and accepted by the review committee within the Department of English, Film, and Theatre or the Department of Mathematics, as appropriate. The review must be completed prior to submitting the course introduction/modification to the SCCCC. Submissions to the appropriate departmental review committee must include the course introduction/modification form and two-page course outline and should be sent to the attention of the appropriate Department Head.

The criteria for identification of courses as satisfying the University written English and mathematics requirement are available at http://umanitoba.ca/faculties/arts/media/Criteria_for_English-Math.pdf.

Recommended Introductory Course (RIC) List: New and modified 1000 level courses and 2000 level courses without prerequisites that are to be included on the RIC List must be reviewed and accepted, for inclusion on the list, by the Executive Director, Student Academic Success. The review must be completed prior to submitting the course introduction/modification to the SCCCC. Submissions must include the course introduction/modification form and two-page (maximum) course outline and should be sent to the Executive Director, Student Academic Success, who will review requests on an ongoing basis.

Faculties/colleges/schools are also required to notify the Executive Director, Student Academic Success and the SCCCC when a course is to be removed from the RIC List. Such notification can be provided on the course modification/deletion form, as appropriate.

▪ **SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE**

Briefly describe the proposed curriculum or course change in your unit and outline the reasons for your request for support in the space provided. Attach any supporting documentation that might be required to describe the proposed changes.

▪ **SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT**

List all of the faculties/colleges/schools/departments solicited for a statement of support in the space provided.

▪ **SECTION E – STATEMENT(S) OF SUPPORT RECEIVED**

One copy of the Statement of Support: Part A – Request form is to be included in your unit's submission to SCCCC, together with all of the responses received from other units (Statement of Support: Part B – Response).

▪ **SECTION F – UNIT REQUESTING SUPPORT**

- To be completed by the unit requesting a statement of support.
- Units asked to provide a statement of support should do so in a timely way, to facilitate the curriculum review processes within both units as well as the SCCCC review process.
- Use the drop-down lists to indicate the **Faculty/College/School** and **Department** (or program) requesting the statement of support.

▪ **SECTION G – UNIT RESPONDING TO REQUEST**

- To be completed by the unit responding to a request for a statement of support.
- Use the drop-down lists to indicate the **Faculty/College/School/University 1** and **Department** (or program) responding to the request for a statement of support.

▪ **SECTION H – RESPONSE TO REQUEST**

- To be completed by the unit responding to a request for a statement of support.
- In the space provided, indicate whether your unit can/cannot provide a statement of support and briefly outline the rationale, if appropriate.

▪ **SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND NEXT STEPS**

- To be completed by the unit responding to a request for a statement of support.
- List the course(s)/program(s) in your unit that would be impacted by the curriculum/course change being proposed.
- Indicate the course/curriculum changes that your unit would be required to make, as a result, and when your unit will submit those course/curriculum changes to the SCCCC for Senate approval (e.g. Fall 2015 or Spring 2016). Normally, this would be the next ensuing Fall or Spring submission deadline, as specified in the SCCCC Timetable for Submissions (<http://umanitoba.ca/admin/governance/meetings/index.html>).

▪ **SECTION J – SIGNATURES**

Print or type names and sign in the spaces provided. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/college/school involved, the form should be co-signed by the Deans/Directors of the faculties/colleges/schools involved, or a supporting statement should be provided.

VII. OTHER SUPPORTING DOCUMENTATION

1. Course outline – required for all course introductions

A two (2) page (*maximum*) outline including:

- the course name, subject code, and course number
- a statement of course objectives
- a statement of course format, including lecture, laboratory, and tutorial hours per week
- a list of topics to be covered in lectures
- a statement on grading and evaluation, including information on the grading scheme, and a brief description of laboratories, tutorials, and assignments, including the weightings of the various types of assessments
- required textbook(s)/readings, if applicable

Course outlines are provided to SCCCC for information, to provide additional information on the manner in which the course content set out in the course description will be delivered and evaluated. The committee recognizes that course outlines will be subject to future changes by the instructor and the department/faculty/school.

2. Library statement: A statement from the subject librarian must accompany all proposals for new courses. The Library must be provided with a course outline as described above. As well, the proposing unit and the subject librarian should discuss and agree upon the bibliography to be used in assessing the strength of the Library's collection in the field. In the case of topics courses, departments are not required to provide the Library with a detailed bibliography but must provide a summary of the topics that might be covered in the course. The Library will need at least one month's notice of course proposals in order to prepare the statement. Additional time will be required for program proposals.

A library statement may not be required for the following types of courses: studio, ensemble, practicums, co-operative, field work, and work terms. A library statement is required for topics courses. Please consult with the Library to confirm whether or not a library statement is required.

SUMMARY SHEET: EXAMPLES

Faculty of Environment, Earth, and Resources

Geological Sciences

Introductions:

GEOL 4380 Mineral Resource Development Cr.Hrs. 3	+3.0
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NET CHANGE IN CREDIT HOURS: +3.0

Program modifications:

The Department is proposing that the Geological Sciences – Geology Electives List B and the Geological Sciences – Geophysics Electives List B be modified to include GEOL 4380.

Faculty of Music

Deletions:

MUSC 1070 Introduction to the History of Music Cr.Hrs. 3	-3.0
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MUSC 1080 History of Music 2 Cr.Hrs. 3	-3.0
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Introductions:

MUSC 1004 Introduction to Music in History 1 Cr.Hrs. 3	+3.0
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MUSC 3054 Medieval and Renaissance Music History Cr.Hrs. 3	+3.0
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MUSC 3064 Baroque Music History Cr.Hrs. 3	+3.0
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Modifications:

MUSC 1190 Ensemble Cr.Hrs. 2	0.0
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MUSC 2400 Major Practical Study Cr.Hrs. 6	0.0
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MUSC 3090 Introduction to Ethnomusicology Cr.Hrs. 3	0.0
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NET CHANGE IN CREDIT HOURS: +3.0

Program modifications:

The faculty is proposing program modifications to the Bachelor of Music, including the General, Performance, Composition, and History concentrations, the Bachelor of Music / Bachelor of Education (Integrated Music Education Program), and the Bachelor of Jazz Studies program in order to: establish a common first year for all students; introduce greater flexibility; clarify curricular structures; eliminate redundancies and gaps; improve balance between academic and performance-based student activities.

FORMAT FOR COURSE DESCRIPTIONS:

Examples of laboratory requirement:

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. For Engineering and Geophysics students only. May not be held with MATH 2720, MATH 2750, or the former MATH 2110. Prerequisites: MATH 1210 or MATH 1211, and MATH 1710 (C).

POLS 1010 Political Ideas and Ideologies Cr.Hrs. 3

(Lab required) An introduction to different philosophical systems of political beliefs and values that structure contemporary political discourse and practise.

Examples of field trip requirement:

BIOL 4390 Principles of Wildlife Management Cr.Hrs. 3

(Lab Required) Introduction to the biological and socioeconomic goals of wildlife management and to the basic techniques of wildlife management in terms of these goals. [There will be four or five field trips](#). Some weekend field trips may be required. Prerequisite: BIOL 3310 (ZOOL 3680) (C); or consent of department.

NATV 3100 Aboriginal Healing Ways Cr.Hrs. 3

This course allows students to work with Aboriginal elders or traditional teachers on concepts of healing and wellness. Emphasis is on Anishinabe or Cree healing practices, though other First Nations approaches may be offered. [This course may include a field trip component](#). Students may not hold credit for both NATV 3100 and NATV 3000 when titled "Exploring Aboriginal Healing." Prerequisite: [a grade of "C" or better in NATV 2100] or written consent of the department head.

Examples of prerequisites and pre-or corequisites, including where there is a minimum grade requirement:

GEOL 4380 Mineral Resource Development Cr.Hrs.3

Examination of economic, political, social, and environmental considerations that affect exploration and mining activity. [Prerequisite: GEOL 3130 \(C+\)](#). [Pre- or co-requisite: GEOL 4300](#).

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. For Engineering and Geophysics students only. May not be held with MATH 2720, MATH 2750, or the former MATH 2110. [Prerequisites: MATH 1210 or MATH 1211, and MATH 1710 \(C\)](#).

ABIZ 2390 Introduction to Environmental Economics Cr.Hrs. 3

The economics of management of water, air and land resource quality, and the economics of conservation. The economic implications of environmental standards, licensing, criteria and pollution charges will be illustrated by current issues. Students may not hold credit for both ABIZ 2390 and ECON 2390. Prerequisite: [\[A grade of "C" or better in ECON 1010 or ECON 1011 or the former ECON 1200 or the former ECON 1201\] or \[a grade of 'C' or better in both ECON 1210 \(or ECON 1211\) and ECON 1220 \(or ECON 1221\)\]](#).

Examples of mutually exclusive course:

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. For Engineering and Geophysics students only. [May not be held with MATH 2720, MATH 2750, or the former MATH 2110](#). Prerequisites: MATH 1210 or MATH 1211, and MATH 1710 (C).

PDSD 3412 Pediatric Dentistry 2 Cr.Hrs. 3

A series of seminars and clinics to give the student a basic understanding and some clinical experience with: clinical procedures, emergency treatment, psychological management, preventive medical considerations and the provision of total dental care to pediatric patients. [May not be held with PDSD 3050](#).

Example of topics course:

SOC 4530 Readings in Sociology Cr.Hrs. 3

A reading course for undergraduates and pre-Master's in sociology. Prerequisite: written consent of department head. As the course content will vary from term to term, [students may take this course more than once for credit](#).

Example of pass/fail grading mode:

NURS 3320 Clinical Nursing Practice 4 Cr.Hrs. 3

Students will apply concepts of health maintenance to clients of all ages with long term illness. The course focuses on chronic illness and related phenomena, analytical thinking, development of nursing roles, application of research findings and membership on an interdisciplinary team. Pre- or corequisite: NURS 3280, NURS 3310. [Course evaluated on a pass/fail basis](#).

Example of registration restriction:

MECH 4162 Thesis Cr.Hrs. 6

0.0

The course will give students the opportunity to gain a research or design experience in their area of interest. Thesis topics must be approved by the head of the department or designate. [This course is restricted to students in Year 4 Mechanical Engineering](#). Prerequisites: ENG 2010 and eligible to graduate. Not to be held for credit with MECH 4160.

EXAMPLES OF DESCRIPTIONS OF PROGRAM MODIFICATIONS:

Revisions to B.Sc. Honours in Actuarial Mathematics

YEAR 1	YEAR 2	YEAR 3	YEAR 4
HONOURS ACTUARIAL 120 CREDIT HOURS			
ECON 1010 ⁵ , ECON 1020 ⁵	ACT 2020, ACT 2120, ACT 2210	ACT 3130, ACT 3230, ACT 3630 , ACT 3340, ACT 4140,	ACT 4060, ACT 4340, ACT 4630 ,
MATH 1500 ¹ , MATH 1700 ¹ , MATH 1300 ¹	STAT 2400, STAT 3400	GMGT 2010	STAT 3470 ⁵ , STAT 3490 ^{3,5}
STAT 1000, STAT 2000	ACC 1100 ^{2,5} , FIN 2200 ^{2,5}	STAT 3050, STAT 3800	MSCI 2150
3 credit hour "W" requirement	MATH 2720 ¹ , MATH 2730 ¹		
	MATH 2300 ⁴		
6 credit hours of electives ²		12 credit hours of approved electives⁶	12 credit hours of approved electives⁶
30 Hours	30 Hours	30 Hours	30 Hours

Revisions to Minor (Concentration) in Latin American Studies

A Minor (Concentration) in Latin American Studies consists of at least 18 credit hours from a minimum of two different departments chosen from the following list.

Anthropology

ANTH 2690	Peoples and Cultures of Contemporary Latin America	3
ANTH 2990	Prehispanic Cultures of Mexico	3

Economics

ECON 3390	Development Economics	6
ECON 3392	An Introduction to Development Economics	3
ECON 3394	Development Economics: Problems and Policies	3

History

HIST 2140	Colonial Latin America (A)	3
HIST 2150	Independent Latin America (A)	3
HIST 3020	South America Since 1945 (A)	3

Spanish

SPAN 2200	Spanish American Culture and Civilization	3
SPAN 2210	Voices and Images of Latin America	3
SPAN 2540	Spanish-American Literature 2	3
SPAN 3080	Contemporary Latin American Novel	3

Electrical Engineering Courses Requirements

ANTH 2430	Ecology, Technology and Society	3
CHEM 1300	Structure and Modelling of Chemistry	3
CIVL 4050	Engineering Economics	3
COMP 1012	Computer Programming for Scientists and Engineers	3
ENG 1430	Design in Engineering	3
ENG 1440	Introduction to Statics	3
ENG 1450	Introduction to Electrical and Computer Engineering	3
ENG 1460	Introduction to Thermal Sciences	3
ENG 2010	Technical Communications	3
ENG 2030	Engineering Communication: Strategies for the Profession	3
or		
ENG 2040	Engineering Communication: Strategies, Practice, and Design	3
ENGL 1400	Thematic Approaches to the Study of Literature (or equivalent)	3
MATH 1210	Techniques of Classical and Linear Algebra	3
MATH 1510	Applied Calculus 1 (or equivalent)	3
MATH 1710	Applied Calculus 2 (or equivalent)	3
MATH 2130	Engineering Mathematical Analysis	3
MATH 2132	Engineering Mathematical Analysis 2	3
MATH 3132	Engineering Mathematical Analysis 3	3
PHIL 1290	Critical Thinking**	3
PHYS 1050	Physics 1: Mechanics	3
PHYS 2152	Modern Physics for Engineers	3
STAT 2220	Introduction to Probability and Statistics	3
ECE 2160	Electronics 2E	5
ECE 2220	Digital Logic Systems	5
ECE 2240	Numerical Methods for Electrical Engineers	4
ECE 2262	Electric Circuits	4
ECE 3540	Advanced Circuit Analysis and Design	4
ECE 3580	Foundations of Electromagnetics	4
ECE 3590	Electromagnetic Theory	4
ECE 3600	Physical Electronics	4
ECE 3610	Microprocessor Systems	4
ECE 3670	Electronics 3E	4
ECE 3720	Electric Power and Machines	4
ECE 3730	Principles of Embedded Systems Design	4
ECE 3780	Signal Processing 1	4
ECE 4150	Control Systems	4
ECE 4260	Communication Systems	4
ECE 4600	Group Design Project	6

Plus 1 Complementary Studies Elective.

Plus 1 Natural Science from the approved list of electives.

Plus 7 Technical Electives from the approved list.

** PHIL 1290 Critical Thinking is the recommended complementary studies elective. However, students may select any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be held for credit within the Faculty of Engineering.

Electrical Engineering: Standard Program Electrical Electives

Program Requirements:

In the standard Electrical Engineering program, seven Technical Elective Courses are required. At least 4 must be taken from the Group A list shown below. The remainder can be either from the below Group A or B lists.

GROUP A TECHNICAL ELECTIVE COURSES: (4 required)

- ECE 3650 Electric Machines
- ECE 4100 Microelectronic Fabrication
- ECE 4140 Power Transmission Lines
- ECE 4160 Control Engineering
- ECE 4180 Introduction to Robotics
- ECE 4200 Electric Filter Design
- ECE 4250 Digital Communications
- ECE 4270 Antennas
- ECE 4280 Engineering Electromagnetics
- ECE 4290 Microwave Engineering
- ECE 4300 Electrical Energy Systems 1
- ECE 4310 Electrical Energy Systems 2
- ECE 4360 High Voltage Engineering
- ECE 4370 Power Electronics
- ECE 4390 Engineering Computations 3E
- ECE 4420 Digital Control
- ECE 4580 Optoelectronics
- ECE 4610 Biomedical Engineering and Instrumentation
- ECE 4830 Signal Processing 2
- ECE 4860 Biomedical Optics
- ECE 4860 Design of RF Devices and Wireless Systems

GROUP B TECHNICAL ELECTIVE COURSES:

- ECE 3700 Telecom Networking
- ECE 3760 Digital System Design 1
- ECE 3770 Digital System Design 2
- ECE 4240 Microprocessor Interfacing
- ECE 4440 Computer Vision
- ECE 4520 Simulation & Modelling
- ECE 4530 Parallel Processing
- ECE 4540 Wireless Networks
- ECE 4740 Digital System Implementation
- ECE 4850 Performance Evaluation for Communications & Computer Eng.
- ECE 4860 Materials Characterization
- COMP 2140 Data Structures and Algorithms
- COMP 3190 Intro. Artificial Intelligence
- COMP 4180 Intelligent Mobile Robotics
- COMP 4360 Machine Learning
- MATH 3120 Applied Discrete Mathematics
- ~~MATH 3700 Applied Complex Analysis~~
- MATH 3340 Complex Analysis 1**
- ~~MATH 3810 Partial Differential Equations 2~~
- MATH 3460 Partial Differential Equations**
- PHYS 2260 Optics
- PHYS 3220 Medical Physics and Physiological Measurement
- PHYS 3640 Electro- and Magnetodynamics and Special Relativity
- PHYS 4590 Advanced Optics



UNIVERSITY
OF MANITOBA


Office of the University Secretary

312 Administration Building
Winnipeg, Manitoba
Canada R3T 2N2
Tel. (204) 474-9593
Fax (204) 474-7511

MEMORANDUM

DATE: March 18, 2015

TO: David Barnard, Chair of Senate

FROM: Jeff M. Leclerc, University Secretary 

SUBJECT: ***APPROVAL OF MOTION, Board of Governors MEETING –
March 18, 2015***

At its meeting on March 17, 2015, the Board of Governors approved the following motions:

THAT the Board of Governors approve one new offer, eleven amended offers, and the withdrawal of three offers, as set out in Appendix A of the Report of the Senate Committee on Awards [dated January 13, 2015].

THAT the Board of Governors approve four new offers and four amended offers, as set out in Appendix A of the Report of the Senate Committee on Awards [dated December 11, 2014].

THAT the Board of Governors approve the establishment of an endowed research Professorship in Neurosciences [as recommended by Senate, February 4, 2015].

THAT the Board of Governors approve the merger of the Department of Textile Sciences and the Department of Biosystems Engineering, as outlined in the proposal dated August 18, 2014.

Copy: S. Coyston, Academic Specialist
D. Jayas, Vice-President (Research & International)
J. Keselman, Vice-President (Academic) & Provost

JML/sf




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OF MANITOBA

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MEMORANDUM

DATE: April 15, 2015
TO: David Barnard, Chair of Senate
FROM: Jeff M. Leclerc, University Secretary 
SUBJECT: ***APPROVAL OF MOTION, Board of Governors MEETING – April 14, 2015***

At its meeting on April 14, 2015, the Board of Governors approved the following motion:

THAT the Board of Governors approve twelve new offers, twenty-six amended offers, and the withdrawal of two offers, as set out in Appendix A of the Report of the Senate Committee on Awards [dated February 17, 2015].

Copy: S. Coyston, Academic Specialist

JML/sf

PRESIDENT'S REPORT: May 13, 2015

GENERAL

As part of the University's commitment to Indigenous Achievement, Indigenous Awareness Week took place March 16 – 21. A series of events brought together Elders, Knowledge Keepers, academics and community members to bring awareness to Treaties and their relevance, to answer questions about what they once meant and mean today, and how they will shape the country's future.

On April 7, the University celebrated the grand opening of the Active Living Centre, its new fitness and research facility. It is a 10,684m² facility that contains a high-performance training facility, an indoor running track, a 12m climbing wall, research centre, strength and conditioning facilities, three group workout studios and gathering places for students. Facilities will be accessible not only to students, faculty and staff but to the community as a whole. The project was funded in partnership with the Governments of Canada and Manitoba and the City of Winnipeg.

Work continues to finalize the University's budget for 2015/16, based on available information. The Budget Advisory Committee met April 6 and is scheduled to meet again on April 14. The provincial budget will be delivered April 30, after which time the amount of the provincial operating grant to the University will be known.

Three University of Manitoba alumni, artists Robert Houle, Micah Lexier and Reva Stone are recipients of the prestigious Governor General's Awards in Visual and Media Arts. To celebrate, the University of Manitoba invited alumni in the Ottawa area to view the collections of these three artists at a public showing at the National Gallery of Canada on April 9, followed by an exclusive reception of alumni and friends.

The election for an alumni representative to the Board of Governors is now open and will run until May 20th at 4:00 pm. The candidates are Shona Connelly and Lindy Norris. Shona Connelly is currently the Director of Major Gifts for the St. Boniface Hospital Foundation and has served on the Alumni Association Board of Directors for six years. Shona is also currently a member of the University of Manitoba Senate. Lindy Norris is the Director of Business Development and Marketing with Pitblado Law, and has also made significant contributions to many non-profit organizations in Manitoba. Ballots can be obtained through Alumni Relations and submitted by mail, fax or email, or by delivering them to the Alumni Relations office during business hours. Results will be determined on May 22nd 2015.

ACADEMIC MATTERS

- Richard Hechter, education, and Mark Guy, Associate Professor of Education, University of North Dakota, received a fellowship from the National Technology Leadership Initiative for their project in which elementary school science teacher candidates are asked to create short movies about scientific concepts to be shown to students.

- John Page, physics and astronomy, is the recipient of the 2015 Brockhouse Medal by the Canadian Association of Physicists for his significant and original contributions to the understanding of ultrasonic wave phenomena in complex media through the development and application of new experimental techniques to characterize the structure and dynamics of such materials, including the first demonstration of Anderson localization of classical waves by disorder in three dimensions. Dr. Page will be presented with his medal at the 2015 CAP Congress in June 2015.
- Courtney Andrysiak, graduate education student, received a Master's Thesis Award by the Canadian Counselling and Psychotherapy Association for her work entitled "The Changing World of Bullying: Students' Opinions about How to Intervene with Cyberbullying".
- Shimon Leible and Andrew Slough, law students, were named the 2015 American Bar Association (ABA) National Negotiation Competition Champions. They were selected from a group of 191 teams from across Canada and the United States.
- Zachary Courtemanche and Anthony Foderaro, law students, won the MacIntyre Cup (Western Canada's Trial Moot Competition) on February 6-7, 2015 at the University of Saskatchewan. They went on to represent Western Canada at the Sopinka Cup in Ottawa on March 13-14, where they placed third overall.
- Braden Calvert, agriculture diploma student, skipped his Manitoba team representing Canada to the gold medal at the 2015 World Junior Championships in Tallinn, Estonia.
- The Manitoba Medical Students' Association held their fourth annual 'Rich Man Poor Man' dinner in February 2015. The event was attended by more than 180 people who experienced a visual representation of how the world eats. One out of every eight guests received a 'Rich Man' meal; a three course meal and the other seven received the 'Poor Man' meal; a one course meal. The dinner also focused on the importance of food security, social accountability, and adequate housing as pillars to a healthier society with proceeds going to the Resource Assistance for Youth (RaY) and the Inner City Jazz on Wheels programs.
- The Faculty of Science participated as judges and mentors in the 13th annual Manitoba First Nations Science Fair held in March, 2015 at the University of Manitoba. More than 500 students from 36 Manitoba First Nations schools took part in the event and competed for Youth Science Canada standards for Gold, Silver, and Bronze medallions of excellence in science.

RESEARCH MATTERS

- The University of Manitoba and Magellan Aerospace (Magellan) jointly opened the Advanced Satellite Integration Facility (ASIF) located at Magellan on March 4. The Honourable Shelly Glover, Minister of Canadian Heritage and Official Languages and MP for Saint Boniface, was present to unveil the new facility. The facility was constructed in an existing space at Magellan's plant, with enough space to accommodate up to three satellites at various stages of assembly. Its expansion was funded by \$2.5 million from Western Economic Diversification Canada, and \$1.5 million from Magellan, with \$625,000 of the Magellan funding earmarked for the establishment of an Industrial Research Chair in the area of satellite development at the Faculty of Engineering.

- The Association of Universities and Colleges of Canada (AUCC) announced selectees for the Queen Elizabeth II Diamond Jubilee Scholarships on March 2. The University of Manitoba was selected as one of thirty-four Canadian universities to manage projects that will offer scholarship opportunities to more than 1,900 university students in the Commonwealth. This initiative will build a dynamic community of young global leaders. The University of Manitoba winning proposal is led by Dr. Josée Lavoie (Community Health Sciences) and Director of the Manitoba First Nations Centre for Aboriginal Health Research. The project, titled: Promoting international community-university partnerships in global and Indigenous health will be undertaken with the Centre for Global Public Health and the Department of Medical Microbiology. The three project partners will receive support of additional program partners in Australia, New Zealand, India and Kenya. Scholarships will be provided to outgoing undergraduate and graduate students, and for incoming graduate students from our partnering Commonwealth countries.
- Forty-five research projects led by 19 investigators were awarded \$2,016,588. Those projects receiving more than \$25,000 are:

PI	Sponsor	Title	Awarded
Beddoes, Jonathan (for Women In Science & Engineering [WISE]) Engineering	NSERC PromoScience	Manitoba Indigenous Outreach Program	\$100,200
Bernstein, Charles (Internal Medicine)	Crohn's & Colitis Foundation of Canada	Denosumab for the treatment of Crohn's disease	\$50,000
Birouk, Madjid (Mechanical and Manufacturing Engineering)	NSERC Collaborative Research & Development (with Biovalco)	Optimization of the combustion of biomass in a commercial furnace - CFD 3D simulation	\$48,000 + \$27,600 (\$75,600)
Bridges, Greg (Electrical and Computer Engineering)	NSERC Engage	Embeddable volatile sensor for a smart shoe	\$25,000
Cenkowski, Stefan (Biosystems Engineering)	NSERC Engage	Technical feasibility of the integration of a gravity feed pellet stove and micro steam turbine	\$25,000
Gole, Aniruddha (Electrical and Computer Engineering)	Manitoba HVDC Research Centre	Developing a platform and methodology to carry out long term power system planning using simulation tools and improving accuracy	\$30,906
Gulden, Robert (Plant Science)	Mustard 21 Canada Inc. (M21)	Seed dormancy and the seedbank persistence of <i>Brassica carinata</i> in Western Canada	\$125,120

Irani, Pourang (Computer Science)	NSERC Engage	Unique impression recognition in a non-obtrusive, non-invasive and privacy-preserving manner	\$25,000
Jeffrey, Ian (Electrical and Computer Engineering)	NSERC Engage	A novel scalable distributed architecture for a multiplayer mobile online game	\$25,000
Jones, Peter (Richardson Centre for Functional Foods and Nutraceuticals)	University of Nebraska	Sterol and isoprenoid diseases consortium	\$66,665
Kordi, Behzad (Electrical and Computer Engineering)	NSERC Engage	High voltage faulty/polluted insulators detection using current sensors developed for transmission line monitoring	\$25,000
McCance, Dawne (Mosaic)	SSHRC	Mosaic - a journal for the interdisciplinary study of literature	\$90,000
McClarty, Grant (Medical Microbiology)	Health Sciences Centre	HSC general fund	\$30,844
Oresnik, Ivan (Microbiology)	NSERC Engage	Isolation of phosphate solubilization bacteria for use in a bioreactor	\$25,000
Paliwal, Jitendra (Biosystems Engineering)	NSERC Engage	Assessment of soybean seed viability using near-infrared and visible imaging	\$25,000
Schwartz, Bryan (Law)	SSHRC	Manitoba law journal funding application	\$88,000
Shafai, Cyrus (Electrical and Computer Engineering)	NSERC Engage	Sensor backplane for smart hive	\$25,000
Shafai, Lot (Electrical and Computer Engineering)	NSERC Engage	Dual band dual polarized coupled microstrip patch antennas for remote sensing and energy harvesting	\$25,000

't Jong, Geert (Pediatrics and Child Health)	Duke University	Pharmacokinetics of understudied drugs administered to children per standard care (PTN-POPS)	\$370,849
Telichev, Igor (Mechanical and Manufacturing Engineering)	NSERC Engage	Virtual sled testing of motorcoach seat structure	\$25,000
Thomas, Gabriel (Electrical and Computer Engineering)	NSERC Engage	Spray measurements based on laser and photodiode detectors	\$25,000
Thompson, Genevieve (Nursing)	CIHR	Excellence in delivering person-centered intimate care: What makes the difference	\$519,912
Thulasiram, Ruppa (Computer Science)	NSERC Engage	Intelligent and exhaustive search algorithm to efficiently serve customers in automotive big data marketplace	\$25,000
Wiebe, Chris (Internal Medicine)	University Medical Group	De novo donor specific antibody development in renal transplant recipients	\$50,000

ADMINISTRATIVE MATTERS

- An outcome from the 'Coming to a Common Place' symposium in November 2014 was a recommendation to establish an Indigenous Advisory Committee to provide guidance to the Visionary (re)Generation Fort Garry Campus planning process. The committee has been established and includes 10 members with broad representation including community leaders, elders, University representatives and alumni. This group will provide direction and feedback to the campus plan draft concepts and design principles. An Indigenous Sub-Committee has also been established. This committee includes 7 members with representation from the local design community, students, faculty, staff and elders. The sub-committee will provide input to the project at a detailed 'project work' level and will further the work undertaken to date in developing and incorporating Indigenous Planning and Design Principles into the campus planning process.
- The Board of Governors approved a time-limited retirement incentive program, which is entirely voluntary and universal to all employees in continuing positions. The program is designed to achieve savings related to salaries and benefits, create flexibility in realigning the workforce to strategic priorities, and recognize the contributions of our senior employees. Employees will be invited to participate in phases, with the first phase receiving their invitation approximately April 1. The program will continue until a maximum cap of incentive funds is expended.

EXTERNAL MATTERS

- For the period of April 1, 2014 to March 27, 2015, the University has raised \$36,568,775.69 for the 2014/2015 fiscal year. As of this date, we have raised \$15.7 million more in our current fiscal year, as compared to last fiscal year.
- Significant gifts and activities in the last reporting period include:
 - Retired Soil Science professor Dr. Geza Racz, and his wife Trudi, have made a gift of \$100,000 to establish two new scholarships in the Faculty of Agricultural & Food Sciences.
 - A \$372,000.00 gift has been received from the estate of Mr. Wilfred A. Bychinsky which will be directed to the Anna Bychinsky Award for Demonstrated Promise, St. Andrew's College, Anna Bychinsky Fine Arts Award and the S. Bychinsky Award for Critical Writing and English.
- On March 2nd, David Barnard, President and Vice-Chancellor, and Tyler MacAfee, Director, Government and Community Engagement, met with several federal government officials and presidents of the federal granting agencies in Ottawa to discuss a number of University of Manitoba strategic priorities such as the National Centre for Truth and Reconciliation, University of Manitoba key federal funding priorities, and the importance of continued federal government funding for the Canada Foundation for Innovation.
- On March 24th, Dr. Barnard, John Kearsey, Vice-President (External) and Tyler MacAfee met with Mayor Brian Bowman to discuss the priorities of the University of Manitoba and how they align with the Mayor's vision for the city. The introduction to the Front and Centre video was shared with the Mayor.
- The University of Manitoba hosted the fifth Visionary Conversations of 2014-2015 - "Are You Happy Now? The Pursuit of Happiness in the Modern Age." Panelists included Dr. Daniel Bailis, Professor and Head, Department of Psychology, Faculty of Arts, Dr. John Walker (Alumnus), Professor, Department of Clinical Health Psychology, College of Medicine, Faculty of Health Sciences and Dr. Fang Wan, Professor, Department of Marketing, I. H. Asper School of Business.
- On March 13th, the University of Manitoba hosted 27 emerging leaders taking part in Leadership Winnipeg. Leadership Winnipeg provides experiences that inspire and help individuals to develop an understanding of themselves, their community and their role in it. While at the University of Manitoba the group received an overview of key University of Manitoba priorities including the Front and Centre campaign, why we market universities, the role of the university in the province's research ecosystem, Indigenous achievement, and the role of the university in the community.

- The recipients of the 2015 Distinguished Alumni Awards were announced publicly on March 27, 2015. They will be honoured at the 2015 Distinguished Alumni Awards Celebration of Excellence on May 12 at the Winnipeg Art Gallery. The recipients are:

2015 Distinguished Alumni Award, Lifetime Achievement

Marion Meadmore, CM [LLB/77]

- Marion Meadmore has spent a lifetime overcoming barriers to create greater opportunities for Indigenous people in Canada. After surviving a decade in the Indian Residential School system as a child, she defied the hatred and negativity of that experience by focusing her attention on education as a means to transform her world in a positive way. Meadmore graduated from Law at the University of Manitoba and became the first Indigenous woman in Canada to be called to the bar. Equipped with intelligence and a strong sense of justice, she dedicated herself to creating organizations that build community, equality and independence for Indigenous people across the country.

2015 Distinguished Alumni Award, Professional Achievement

Nick Logan [BA/71, BComm(Hons)/73]

- During his 40 years as president and CEO of National Leasing, Nick Logan blended innovative business ideas with a personal philosophy around corporate culture steeped in the values of mentorship, teamwork and respect. Logan helped build an environment at National Leasing's Winnipeg headquarters that reflected his view of corporate culture. There, staff might be found playing ball hockey together in the parking lot or working out in an in-house gym. Logan's influence and impact as a professional, a philanthropist and volunteer in the community speak volumes about his passion and ability to bring out the best in people.

2015 Distinguished Alumni Award, Community Service

Wayne Davies [BEd/91, PB DipEd/07]

- Long-time educator Wayne Davies gave awesome opportunities to junior high students: building custom guitars; recruiting rock stars, professional athletes, even former U.S. presidents to autograph them; then auctioning them off to support local charities. In 2010, a group of teachers at the École Selkirk Junior High School in Selkirk, Man., helped then-principal Davies turn this rock 'n' roll fantasy into reality with the founding of the Building on Students Success (B.O.S.S.) Guitar Works Program. Three short years later, in 2013, B.O.S.S. participants had built 325 fully playable guitars and raised more than \$100,000 for the Canadian Museum for Human Rights as well as an additional \$40,000 for various other charities.

2015 Distinguished Alumni Award, Service to the University of Manitoba

Juliette (Archie) Cooper [BOT/79, MSc/82, PhD/87]

- The University of Manitoba is a better place because of Juliette (Archie) Cooper. Throughout her career as a researcher and professor in the School of Medical Rehabilitation (SMR)—now the College of Rehabilitation Services—Cooper has taught and mentored generations of students and distinguished herself as a leading thinker in the field of occupational therapy. Beyond her guidance of students, Cooper has enhanced the overall university community through her tireless volunteer efforts as a fundraiser and as key advisor to the secretary and the board of governors on strategic matters. A professor emerita since 2005, Cooper continues to work at the University of Manitoba a decade into her 'retirement', still enjoying teaching and contributing to the University.

2015 Distinguished Alumni Award, Outstanding Young Alumni

Tito Daodu [MD/13, BSc(Med)/13]

- Though she had yet to reach a double-digit birthday, Tito Daodu had lived in four countries on three different continents, before settling in Winnipeg with her family. This early experience had a profound effect on the impressionable eight-year-old as she saw and experienced first-hand the inequality that exists around the world. Her resulting desire to create positive change in the world inspired her to pursue a medical degree at the University of Manitoba. She offered mentorship to inner city kids involved with the same outreach program that once encouraged her to dream big. When Daodu earned her MD in 2013, these same core-area neighbourhood children cheered her on at convocation.
- On April 23rd, the University of Manitoba will be hosting a reception for alumni in Halifax and the surrounding area. President and Vice Chancellor David Barnard and Danielle Dunbar, Acting Associate Vice-President, Donor Relations, will host the event to engage with alumni in a meaningful way, and to reconnect graduates with their alma mater.
- This year's institutional campaign is an evolution of our Trailblazer campaign and brand story. Outstanding University of Manitoba alumni are featured to profile the impact a University of Manitoba education has on their lives and to inform a broader audience of the contribution University of Manitoba alumni are making in society. The "Trailblazers Do" creative will run consistently across the national and Manitoba markets and as in previous years our creative will run in the James Richardson International Airport. To build on the "Trailblazers Do" campaign, new pillar wraps and an airport spectacular were installed in early March 2015.

Four pillar wraps feature prominent University of Manitoba alumni:

- Robert Houle, Art History '72;
 - Dr. Tito Daodo, Medicine '13;
 - Sasa Radulovic, Architecture '03
 - Jennifer Jones, Law '99
- Additionally, a new airport spectacular featuring Andrianna Chuchman, Music '04 was installed in the Arrivals area.

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 Jeff Taylor will be the Speaker for the Executive Committee for the May meeting of Senate.

2. Appointments of Chair and Vice-Chair, Senate Committee on Appeals

Professor Archie McNicol's term as Chair of the Senate Committee on Appeals will conclude on May 31, 2015. Senate Executive has reappointed Professor McNicol to the position of Chair for a term ending May 31, 2018.

Professor Sharon Alward's term as Vice-Chair of the Senate Committee on Appeals will conclude on May 31, 2015. Senate Executive has reappointed Professor Alward to the position for a term ending May 31, 2018.

3. Appointments of Chair and Vice-Chair, Senate Committee on Admission Appeals

Dean David Mandzuk's term as Chair of the Senate Committee on Admission Appeals will conclude on May 31, 2015. Senate Executive has reappointed Dean Mandzuk to the position of Chair for a term ending May 31, 2018.

Professor Brenda Hann's term as Vice-Chair of the Senate Committee on Admission Appeals will conclude on May 31, 2015. Senate Executive has reappointed Professor Hann to the position of Vice-Chair for a term ending May 31, 2018.

4. Vacancies on the Senate Committee on Nominations

The report of the University Secretary on the Senate Committee on Nominations is attached (Appendix A). Members of the Senate Committee of Nominations are nominated by the Senate Executive Committee and elected by Senate (See recommendation below). Senate Executive has made recommendations on nominations for three of the five vacancies for academic staff.

Two vacancies for academic staff remain; one for a representative of Agriculture, Environment, Earth, and Resources, and Human Ecology (three-year term), and one for a representative of Libraries and Student Affairs (one-year term). Nominations will be brought forward to an upcoming meeting of Senate.

Two vacancies for students members (one-year terms) also remain.

5. Comments of the Executive Committee of Senate

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

Recommendation

The Senate Executive Committee recommends that the following nominations to the Senate Committee on Nominations be approved by Senate for three-year terms ending May 31, 2018:

- a) Professor Sandra Kouritzin (re-appointment), representing Education
- b) Professor Gordon Fitzell (re-appointment, Senator), representing Music
- c) Professor Helen Cameron (re-appointment) representing Science

Respectfully submitted,

Dr. David Barnard, Chair
Senate Executive Committee

Terms of Reference:

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

Vacancies on the Senate Committee on Nominations

At the July 1977 meeting of Senate, Senate approved without debate area representations for the Senate Committee on Nominations. The representation was amended in July 1991 to include the Libraries, in June 2005 to include the Clayton H. Riddell Faculty of Environment, Earth and Resources, and in October 2014 to take into account the Faculty of Health Sciences.

The current membership is as follows:

Agriculture, Environment, Earth and Resources & Human Ecology	Prof. Carla Taylor*	2015
Architecture & Engineering	Dr. Jay Doering*	2016
Arts	Prof. Pam Perkins	2017
Education, Kinesiology and Recreation Management & Extended Education	Prof. Sandra Kouritzin*	2015
Health Sciences (2)	Prof. Marie Edwards*	2016
	Prof. Archie McNicol*	2017
Libraries & Student Affairs	Dean Neal Davies*	2016
Management, Law & Social Work	Prof. Robert Biscontri	2017
Music & School of Art	Prof. Gordon Fitzell	2015
Science	Prof. Helen Cameron	2015
Students (2)	Mr. Hooman Derakhshani	2015
	Mr. Tanjit Nagra	2015

* denotes member of Senate at time of appointment

The terms for Professors Carla Taylor, Sandra Kouritzin, Gordon Fitzell and Helen Cameron will end on May 31, 2015. Consequently, replacements are required for the following areas for the term of June 1, 2015 to May 31, 2018:

Agriculture, Environment, Earth and Resources & Human Ecology
Education, Kinesiology and Recreation Management & Extended Education
Music & School of Art
Science

Due to the changes in area representation, a replacement will be required for Dean Neal Davies to represent Libraries & Student Affairs for the balance of his term ending May 31, 2016.

The composition of the Senate Committee on Nominations calls for ten members of the academic staff, the majority of whom are to be members of Senate. Since four of the academic members currently on the Committee were Senators at the time of appointment, at least two of the replacements must be members of Senate at the time of election to the Senate Committee on Nominations.

The terms of Mr. Hooman Derakhshani and Ms Tanjit Nagra as student members will end on May 31, 2015. Consequently, student replacements are required for the term June 1, 2015 to May 31, 2016.

REPORT OF THE SENATE COMMITTEE ON AWARDS – PART B

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 Awards*, such offers shall be submitted to Senate for approval. (Senate, October 7, 2009)

Observation

At its meeting of March 31, 2015, the Senate Committee on Awards reviewed five new offers that appear to be discriminatory according to the policy on the *Non-Acceptance of Discriminatory Awards*, as set out in Appendix A of the *Report of the Senate Committee on Awards - Part B* (dated March 31, 2015).

Recommendation

The Senate Committee on Awards recommends that Senate and the Board of Governors approve five new offers, as set out in Appendix A of the *Report of the Senate Committee on Awards- Part B* (dated March 31, 2015). This award decision complies with the published guidelines of November 3, 1999, and is reported to Senate for information.

Respectfully submitted,

Dr. Phil Hultin
Chair, Senate Committee on Awards

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

SENATE COMMITTEE ON AWARDS

Appendix A March 31, 2015

1. NEW OFFERS

Lewis Bursary

In honour of his great-aunt Sarah Lewis, Anthony Williams, B.Sc. (Hons.)/77, has established an endowment at fund at the University of Manitoba with a gift of \$100,000 in 2015. The purpose of the fund is to provide financial support to Indigenous undergraduate students in the Faculty of Science. Beginning in the 2016-2017 academic year, the available annual income will be used to offer bursaries with a minimum value of \$1,500 each to undergraduate students who:

- (1) are Indigenous (Status, non-Status, Métis, Inuit);
- (2) are enrolled full-time (minimum 60% course load) in any year of study in the Faculty of Science;
- (3) have a record of satisfactory achievement which is defined as:
 - (a) for first year students, the required minimum entrance average based on those courses used for admission;
 - (b) for continuing students, a minimum degree grade point average of 2.5;
- (4) have demonstrated financial need on the standard University of Manitoba bursary application form.

The bursaries are renewable (with a minimum value of \$1,500 each) for up to three years provided that the recipients:

- (1) continue to be enrolled full-time (minimum 60% course load) in the Faculty of Science;
- (2) have achieved a minimum degree grade point average of 2.5;
- (3) continue to demonstrate financial need on the standard University of Manitoba bursary application form.

The selection committee will have the discretion to determine the number and value of awards, based on the available funds.

In the event that a recipient does not qualify for continuation of the award, the University may select another qualified student to receive the funds that would have been awarded to the initial recipient.

The Dean of the Faculty of Science (or designate) will name the selection committee for this award.

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 this award.

(Attachment I)

MTS Future First Bursary in Aboriginal Business Education

As a long-time supporter of the Aboriginal Business Education Partners (ABEP) program, MTS (Manitoba Telecom Services Inc.) has formalized their support with the establishment of an annually funded bursary. The purpose of the bursary is to support students in the ABEP program in the I.H. Asper School of Business at the University of Manitoba. Each year, two bursaries of \$1,000 will be offered to undergraduate students who:

- (1) are members of the Aboriginal Business Education Partners (ABEP) program;
- (2) are enrolled full-time (minimum 60% course load) in the B.Comm. (Hons.) program in the I.H. Asper School of Business;

- (3) have achieved a minimum degree grade point average of 2.0;
- (4) have demonstrated financial need on the ABEP bursary application form as approved by the Financial Aid and Awards office at the University of Manitoba.

If there are no candidates that meet all of the criteria, the bursary may be offered to a student who is enrolled full-time (minimum 60% course load) in any faculty or school at the University of Manitoba and otherwise meets criteria (1), (3) and (4).

The donor will notify the Financial Aid and Awards office at the University of Manitoba by no later than March 31 in any year this award will not be offered.

The selection committee shall be named by the Director of the Aboriginal Business Education Partners (ABEP) program (or designate).

(Attachment II)

MTS Future First Scholarship in Aboriginal Business Education

As a long-time supporter of the Aboriginal Business Education Partners (ABEP) program, MTS (Manitoba Telecom Services Inc.) has formalized their support with the establishment of an annually funded scholarship. The purpose of the award is to recognize students in the ABEP program in the I.H. Asper School of Business at the University of Manitoba. Each year, one scholarship of \$1,000 will be offered to an undergraduate student who:

- (1) is a member of the Aboriginal Business Education Partners (ABEP) program;
- (2) is enrolled full-time (minimum 80% course load) in the B.Comm. (Hons.) program in the I.H. Asper School of Business;
- (3) has achieved a minimum degree grade point average of 3.0.

If there are no candidates that meet all of the criteria, the scholarship may be offered to a student who is enrolled full-time (minimum 80% course load) in any faculty or school at the University of Manitoba and otherwise meets criteria (1) and (3).

The donor will notify the Financial Aid and Awards office at the University of Manitoba by no later than March 31 in any year this award will not be offered.

The selection committee shall be named by the Director of the Aboriginal Business Education Partners (ABEP) program (or designate) and will include a representative from MTS.

(Attachment II)

Pauline and Roger Presland Bursaries in Aboriginal Business Education – Select Manitoba College and Select Manitoba University Diploma Graduates

Pauline and Roger Presland will offer an annual contribution of \$15,000 for ten years, to offer three renewable bursaries of \$5,000 each, beginning in 2015-2016 and ending in 2024-2025. The aim of the bursaries is to provide support to student members of the Aboriginal Business Education Partners (ABEP) program who enroll in the I.H. Asper School of Business upon completion of the diploma portion of one of the approved articulation agreements in place with select Manitoba colleges and select Manitoba universities. Each year, the bursaries will be offered to undergraduate students who:

- (1) are members of the Aboriginal Business Education Partners (ABEP) program;
- (2) have enrolled in the I.H. Asper School of Business upon completion of the diploma portion of one of the approved articulation agreements in place with select Manitoba colleges and select Manitoba universities;
- (3) are enrolled full-time (minimum 60% course load) in the I.H. Asper School of Business at the University of Manitoba;

- (4) have a record of satisfactory academic achievement defined as:
 - a. for entering students, meeting the minimum admission requirements for the I.H. Asper School of Business as identified in the articulation agreement with the corresponding Manitoba college or Manitoba university;
 - b. for continuing students, a minimum degree grade point average of 2.0;
- (5) have demonstrated financial need on the ABEP bursary application form as approved by the Financial Aid and Awards office at the University of Manitoba.

The \$5,000 bursaries are renewable provided that the recipients:

- (1) continue to be members of the Aboriginal Business Education Partners (ABEP) program;
- (2) are enrolled full-time (minimum 60% course load) in the I.H. Asper School of Business at the University of Manitoba;
- (3) have achieved a minimum degree grade point average of 2.0;
- (4) continue to demonstrate financial need on the ABEP bursary application form as approved by the Financial Aid and Awards office.

If there are no qualified applicants, the selection committee will have the discretion to offer the award to a student, or students, from the pool of ABEP bursary applicants who otherwise meet criteria (1) and (3) through (5), as set out in the first paragraph.

Only three recipients may hold the bursaries at any one time. In the event that a recipient does not qualify for the renewal, a new recipient will be selected based on the first set of eligibility criteria.

The funds for each bursary will first be applied to the recipients' tuition fees. In the event that there are funds remaining once those expenses have been paid, the recipient will receive a cheque from the Financial Aid and Awards office intended to offset the costs of books and course supplies.

The donors will notify the Financial Aid and Awards office at the University of Manitoba by no later than March 31 in any year they wish to discontinue this award.

The selection committee shall be named by the Director of the Aboriginal Business Education Partners (ABEP) program (or designate) and may include the Director of Financial Aid and Awards (or designate).

(Attachment III)

Scott Saxberg Entrance Scholarship in Engineering

Scott Saxberg has established an annually funded entrance scholarship for students in the Faculty of Engineering. The purpose of the scholarship is to recognize academic excellence as well as athletic and extra-curricular involvement in students entering directly from high school to the University of Manitoba. Each year, beginning in 2015-2016, scholarships of \$3,000 each will be offered to two undergraduate students (at least one of whom is female) who:

- (1) are entering the Faculty of Engineering at the University of Manitoba directly from high school and enroll full time (minimum 24 credit hours);
- (2) have achieved high standing (minimum 85% average) in Mathematics 40S (Pre-Calculus), Physics 40S and Chemistry 40S;
- (3) have represented their high school as student-athletes and/or have participated in extra-curricular activities.

Preference will be given to students from John Taylor High School.

Students will be required to submit a letter of reference from a teacher or principal at their high school indicating how they meet criterion (3) above.

The donor will notify the Financial Aid and Awards office by no later than March 31 in any year the award will not be offered.

The selection committee will be the Scholarships, Bursaries and Awards Committee of the Faculty of Engineering and will include a donor representative.

(Attachment IV)



UNIVERSITY
OF MANITOBA

Faculty of Science

Office of the Dean
239 Machray Hall
Winnipeg, Manitoba
Canada R3T 2N2
Telephone: 204-474-8256
Fax: 204-474-7618
Toll Free: 1-800-432-1960 ext. 8256

February 18, 2015

Dr. Philip Hultin
Chair, Senate Committee on Awards
c/o Adrienne Domingo,
Awards Establishment Coordinator
422 University Centre
University of Manitoba

Dear Dr. Hultin,

The Faculty of Science is happy to support the establishment of the Lewis Bursary.

When comparing the numbers in the table below to the number of self-declared Indigenous people in the general Manitoba population (15%), it becomes clear that Indigenous students are under-represented at the University of Manitoba.

Year (fall)	Number of Indigenous Students (undergraduate)	% Indigenous
2014	229	5.2
2013	186	4.6
2012	160	4.4
2011	142	4.3
2010	135	4.4

As an institution, I know that we're all committed to increasing the number of Indigenous students on our campuses. Awards such as this will provide support to Indigenous students which will contribute to meeting our goals and more importantly will contribute to the success of individual Indigenous students.

Sincerely,

Dr. Stefi Baum
Dean
Faculty of Science





Asper School of Business

March 17, 2015

Dr. Philip Hultin
Chair, Senate Committee on Awards
c/o Mandy Laing,
Awards Establishment/Selection Coordinator
424E University Centre
University of Manitoba

Michael Benarroch, PhD
Dean and CA Manitoba Chair in Business Leadership
314 Drake Centre
181 Freedman Crescent
Winnipeg, Manitoba
Canada R3T 5V4
Telephone 204-474-9209
Fax 204-474-7928
Email: m_benarroch@umanitoba.ca

RE: MTS Future First Bursary and Scholarship in Aboriginal Business Education

Dear Dr. Hultin,

The I.H. Asper School of Business supports the establishment of both the MTS Future First Bursary in Aboriginal Business Education and the MTS Future First Scholarship in Aboriginal Business Education.

In the Fall Term of 2014, the School's self-declared Aboriginal student population was 3.6% of total enrolment, compared to the University of Manitoba Aboriginal student population average of 7.3%

Aboriginal student enrolment data for the past five years in the I.H. Asper School of Business is provided for context in the table below.

Year (Fall Term)	Number of Aboriginal Students	Total Students	% Aboriginal Students
2014	63	1753	3.6
2013	55	1752	3.1
2012	59	1742	3.4
2011	62	1698	3.7
2010	62	1604	3.9

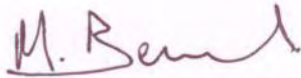
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Letter to Dr. Philip Hultin
Chair, Senate Committee on Awards
Page Two
March 17, 2015

As an institution, our commitment is to increase the number of Aboriginal students on our campuses. Increasing the number of bursaries, scholarships and awards for Aboriginal students contributes to this commitment. This bursary and scholarship will provide the I.H. Asper School of Business the opportunity to recruit, support and retain Aboriginal students at the University of Manitoba and, in doing so, will also contribute to the success of individual Aboriginal students.

Sincerely,

A handwritten signature in dark ink, appearing to read "M. Benarroch". The signature is fluid and cursive, with the first name "M." and the last name "Benarroch" clearly distinguishable.

Dr. Michael Benarroch



UNIVERSITY
OF MANITOBA

Asper School of Business

March 5, 2015

Dr. Philip Hultin
Chair, Senate Committee on Awards
c/o Mandy Laing,
Awards Establishment/Selection Coordinator
424E University Centre
University of Manitoba

Michael Benarroch, PhD
Dean and CA Manitoba Chair in Business Leadership
314 Drake Centre
181 Freedman Crescent
Winnipeg, Manitoba
Canada R3T 5V4
Telephone 204-474-9209
Fax 204-474-7928
Email: m_benarroch@umanitoba.ca

Dear Dr. Hultin,

RE: Pauline and Roger Presland Bursaries in Aboriginal Business Education – Select Manitoba College and Select Manitoba University Diploma Graduates

The I.H. Asper School of Business supports the establishment of the Pauline and Roger Presland Bursaries in Aboriginal Business Education – Select Manitoba College and Select Manitoba University Diploma Graduates.

In the Fall Term of 2014, the School's self-declared Aboriginal student population was 3.6% of total enrolment, compared to the University of Manitoba Aboriginal student population average of 7.3%

Aboriginal student enrolment data for the past five years in the I.H. Asper School of Business is provided for context in the table below.

Year (Fall Term)	Number of Aboriginal Students	Total Students	% Aboriginal Students
2014	63	1753	3.6
2013	55	1752	3.1
2012	59	1742	3.4
2011	62	1698	3.7
2010	62	1604	3.9

/continued



Dr. Philip Hultin
Chair, Senate Committee on Awards
March 5, 2015
Page Two

As an institution, our commitment is to increase the number of Aboriginal students on our campuses. Increasing the number of bursaries, scholarships and awards for Aboriginal students contributes to this commitment. This bursary will provide the I.H. Asper School of Business the opportunity to recruit, support and retain Aboriginal students at the University of Manitoba and, in doing so, will also contribute to the success of individual Aboriginal students.

Sincerely,

A handwritten signature in black ink, appearing to read 'M Benarroch', with a stylized, cursive script.

Michael Benarroch



UNIVERSITY
OF MANITOBA

Faculty of Engineering
Office of the Dean

E2-290 Engineering Building
Winnipeg, Manitoba
Canada R3T 5V6
Telephone 204-474-9809
Fax 204-275-3773

11 February 2015

Dr. Philip Hultin
Chair, Senate Committee on Awards
c/o Mandy Laing
Awards Establishment/Selection Coordinator
424E University Centre
University of Manitoba

Dear Dr. Hultin,

RE: Scott Saxberg Entrance Scholarship in Engineering

The Faculty of Engineering supports the establishment of the Scott Saxberg Entrance Scholarship in Engineering.

In the Fall Term of 2013, the Faculty's female student population was 18% of total enrolment, compared to the University of Manitoba female student population average of 55%.

Undergraduate female student enrolment data for the past five years in the Faculty of Engineering is provided for context in the table below. Graduate student enrolment of about 450 students is approximately 21% female.

Year (Fall Term)	Number of Female Students	Total Students	% Female Students
2013	301	1644	18%
2012	265	1497	18%
2011	230	1309	18%
2010	213	1259	17%
2009	190	1227	15%

As a Faculty, we are supportive of increasing the number of female students enrolled in our programs. Increasing the number of scholarships, bursaries, and awards for female students in Engineering contributes to this endeavor. This scholarship will provide the Faculty of Engineering the opportunity to recruit, recognize and retain female students and, in doing so, will also contribute to the success of individual female students in their chosen field.

Sincerely,

A handwritten signature in cursive script that reads "J. Beddoes".

Jonathan Beddoes, Ph.D., P.Eng.
Professor and Dean



208 Administration Building
Winnipeg, Manitoba
Canada R3T 2N2
Telephone (204) 480-1408
Fax (204) 275-1160

UNIVERSITY
OF MANITOBA

Office of the Vice-President
(Academic) & Provost

April 22, 2015

To: Mr. Jeff Leclerc, University Secretary
From: Dr. Joanne Keselman, Vice-President (Academic) and Provost
Subject: Closure: Faculty of Human Ecology

Please see the attached letter from Dr. Harvy Frankel, Acting Dean, Faculty of Human Ecology dated April 2, 2015 recommending the closure of the Faculty of Human Ecology effective July 1, 2015.

To reiterate, the Department of Human Nutritional Sciences joined the Faculty of Agricultural and Food Sciences effective July 1, 2014; the Department of Family Social Sciences will merge with the Department of Community Health Sciences, College of Medicine effective July 1, 2015 and the Department of Textile Sciences will join the Department of Biosystems Engineering, Faculty of Agricultural and Food Sciences effective July 1, 2015. As such, all departments and associate programs will be transferred to other faculties by July 1, 2015.

I support the recommendation to close the Faculty of Human Ecology effective July 1, 2015.

Enclosure



UNIVERSITY
OF MANITOBA

Faculty of
Human Ecology

Office of the Dean
Harvy Frankel
Acting Dean

To Senate
RAM →
209 Human Ecology
Winnipeg, Manitoba
Canada R3T 2N2
Phone: (204) 474-9704
Fax: (204) 474-7592
h_ecology@umanitoba.ca

April 6, 2015

To: Dr. Joanne Keselman, Vice-President (Academic) and Provost

From: Dr. Harvy Frankel, Acting Dean, Faculty of Human Ecology

Subject: Faculty of Human Ecology



As part of the University's Academic Structure Initiative, the Faculty of Human Ecology and its departments have been exploring and formalizing structural changes. As a result of these discussions, on May 20, 2014, the Board of Governors approved Senate's recommendation that the Department of Human Nutritional Sciences move to the Faculty of Agricultural and Food Sciences effective July 1, 2014.

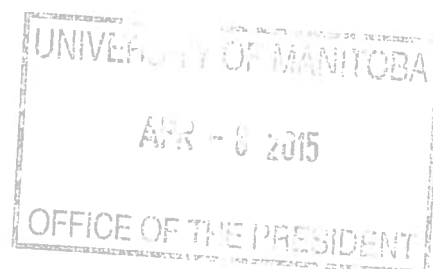
On June 24, 2014, the Board of Governors approved Senate's recommendation that the Department of Family Social Sciences join the Department of Community Health Sciences, Faculty of Health Sciences effective July 1, 2015.

On March 17, 2015, the Board of Governors approved Senate's recommendation that the Department of Textile Sciences join the Department of Biosystems Engineering, Faculty of Agricultural and Food Sciences effective July 1, 2015.

Given that all Faculty of Human Ecology's departments and their respective programs have been formally approved to transfer to other faculties within the University by July 1, 2015, I am recommending that the Faculty of Human Ecology be closed effective July 1, 2015.

cc: Dr. D. Collins
Mr. J. Leclerc

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





UNIVERSITY
OF MANITOBA

Faculty of Science

Office of the Dean
239 Machray Hall
Winnipeg, Manitoba
Canada R3T 2N2
Phone (204) 474-9348
Fax (204) 474-7618

February 24, 2015

Dr. Janice Ristock
Chair of SCIE
Attention: Shannon Coyston, Academic Specialist

Re: Proposal to modify the B.Sc. Major Degree academic regulations

Dear Dr. Ristock;

Please find attached a proposal to modify the academic regulations in the B.Sc. Major Degree. Specifically, the proposal is to modify the entrance and continuation requirements to indicate that the student's Degree Grade Point Average will be used to assess eligibility for entrance and continuation in the B.Sc. Major Degree. This proposed change will make the GPA for entry and continuation in the B.Sc. Major consistent for all students, both first and second degree students, and with the GPA being used for entry and continuation in the B.Sc. Honours program.

This proposal was approved at the Faculty of Science's Faculty Council meeting February 9, 2015.

Please contact me if you have further questions.

Sincerely,

Dr. Michele Piercey-Normore
Associate Dean, Faculty of Science

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

**FACULTY OF SCIENCE – B.Sc. MAJOR DEGREE
ACADEMIC REGULATIONS MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Current B.Sc. Major Academic Regulations:

B.Sc. (Major): Academic Regulations

To qualify for the degree Bachelor of Science (Major), a student must complete 120 credit hours or more, with minimum grades of “C” on Major Program Specific courses (as specified by the department), ~~passing grades (“D” or better}~~ on the remaining courses, and a minimum grade point average of 2.00 on the 120 credit hours which contribute to the degree.

Program Specific courses are those identified by the department as being core to the given degree. See the Calendar entry for these departments for clarification.

At least six credit hours **must** be taken from outside the Faculty of Science. As of the 1999-2000 regular session, students admitted to a Major program must complete six credit hours of courses from the Faculty of Arts. Students in the Major degree programs may take a maximum of 36 credit hours from outside the Faculty of Science.

B.Sc. (Major): Entrance Requirements

To enter a four year Major program, a student must normally have achieved a minimum grade of “C+” in at least one introductory course designated by the department(s). In addition, to enter a four year Major program a student shall normally have completed at least 30 credit hours, although a student may enter on the recommendation of the department with only 24 credit hours completed.

Any student who, prior to being admitted to a four year Major program that has completed more than 30 credit hours will be allowed to apply those excess credit hours which meet the specifications of the program to the four year Major program.

Students must attain a ~~Cumulative~~ Grade Point Average of at least 2.00 (~~DGPA of 2.00 for Second Degree students and Start Afresh students~~) regardless of the point of entry, and must meet continuation requirements as outlined below.

B.Sc. (Major): Continuation Requirements

To continue in the program, a student must maintain a ~~Cumulative~~ Grade Point Average of 2.00 (~~DGPA of 2.00 for Second Degree students and Start Afresh students~~) at each point of assessment. Students who do not meet this minimum will be required to withdraw from the Major program.

There is no minimum term course load requirement for the Major program.

Proposed B.Sc. Major Academic Regulations:

B.Sc. (Major): Academic Regulations

To qualify for the degree Bachelor of Science (Major), a student must complete 120 credit hours or more, with minimum grades of "C" on Major Program Specific courses (as specified by the department) **and grades of "D" or better** on the remaining courses, and a minimum grade point average of 2.00 on the 120 credit hours which contribute to the degree.

Program Specific courses are those identified by the department as being core to the given degree. See the Calendar entry for these departments for clarification.

At least six credit hours **must** be taken from outside the Faculty of Science. As of the 1999-2000 regular session, students admitted to a Major program must complete six credit hours of courses from the Faculty of Arts. Students in the Major degree programs may take a maximum of 36 credit hours from outside the Faculty of Science.

B.Sc. (Major): Entrance Requirements

To enter a four year Major program, a student must normally have achieved a minimum grade of "C+" in at least one introductory course designated by the department(s). In addition, to enter a four year Major program a student shall normally have completed at least 30 credit hours, although a student may enter on the recommendation of the department with only 24 credit hours completed.

Any student who, prior to being admitted to a four year Major program that has completed more than 30 credit hours will be allowed to apply those excess credit hours which meet the specifications of the program to the four year Major program.

Students must attain a **Degree** Grade Point Average of at least 2.0 regardless of the point of entry, and must meet continuation requirements as outlined below.

B.Sc. (Major): Continuation Requirements

To continue in the program, a student must maintain a **Degree** Grade Point Average of 2.00 at each point of assessment. Students who do not meet this minimum will be required to withdraw from the Major program.

There is no minimum term course load requirement for the Major program.

Summary & Rationale:

Change the B.Sc. Major entrance and continuation requirements GPA from a cumulative GPA to a degree GPA for all students. This change would apply to all B.Sc. Major programs in the Faculty of Science.

This change will make the GPA for entry and continuation in the B.Sc. Major consistent for all students and with the GPA being used for entry and continuation in the B.Sc. Honours program.

Remove the word passing grades from the first paragraph in the B.Sc. Major Academic Regulations. It has been previously pointed out by the SCCCC that a grade of D is not considered a pass in all faculties and this may be confusing for some students.

Report of the Senate Committee on Instruction and Evaluation RE: Revised Entrance and Continuation Requirements, B.Sc.(Maj.) Programs, Faculty of Science

Preamble:

1. The terms of reference for the Senate Committee on Instruction and Evaluation (SCIE) are found on the web at:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/502.htm
2. At its meeting on March 19, 2015, the Committee considered a proposal from the Faculty of Science to revise its Academic Regulations for the Bachelor of Science (Major) degree. In particular, the Faculty is proposing changes to the Entrance and Continuation requirements for the B.Sc.(Maj.) degree programs.

Observations:

1. The Faculty of Science is proposing that both the entrance and continuation requirements for the B.Sc.(Maj.) be modified to require a minimum Degree Grade Point Average of 2.00 for all students. Currently, students seeking a first degree require a Cumulative Grade Point Average of 2.00 for entrance and continuation, while second degree and Start Afresh students require a minimum Degree Grade Point Average of 2.00.
2. The objective of the proposal is to begin to address a concern raised by the Senate Committee on Curriculum and Course Changes, in the Fall 2014, that the use of various Grade Point Averages, to assess students for entrance and continuation, is not consistent across the Faculty.
3. The Faculty of Science will request that Departments review and update their section of the Academic Calendar, to ensure that entrance and continuation requirements for B.Sc.(Maj.) programs in their units refer to the required Degree Grade Point Average, as specified in the general Academic Regulations for the Faculty.
4. The Senate Committee on Curriculum and Course Changes also considered proposed changes to the Academic Regulations for the B.Sc.(Maj.) degree at its meeting on March 26, 2015. The SCCCC endorsed the proposal.

Recommendation:

The Senate Committee on Instruction and Evaluation recommends:

THAT Senate approve the Report of the Senate Committee on Instruction and Evaluation concerning revised Academic Regulations on Entrance and Continuation Requirements for Bachelor of Science (Major) programs, Faculty of Science, effective September 1, 2015.

Respectfully submitted,

Dr. Janice Ristock, Chair
Senate Committee on Instruction and Evaluation

Report of the Senate Committee on Curriculum and Course Changes RE: Revised Entrance and Continuation Requirements, B.Sc.(Maj.) Programs, Faculty of Science

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 March 26, 2015, the committee considered a proposal from the Faculty of Science to modify the Academic Regulations for the Bachelor of Science (Major) degrees. In particular, the Faculty is proposing changes to Entrance and Continuation Requirements for the B.Sc.(Maj.) degree programs.

Observations:

1. The Faculty of Science is proposing that a minimum Degree Grade Point Average of 2.00 be required for both entrance to, and continuation in, the B.Sc.(Maj.) degree programs, regardless of the point of entry of students into the programs. Currently, students seeking a first degree require a Cumulative Grade Point Average of 2.00 for entrance and continuation, while second degree and Start Afresh students require a minimum Degree Grade Point Average of 2.00.
2. The objective of the proposal is to begin to address a concern raised by the committee, in the Fall 2014, that the use of various Grade Point Averages, to assess students for entrance and continuation, is not consistent across the Faculty.
3. The Senate Committee on Instruction and Evaluation also considered proposed changes to the Academic Regulations for the B.Sc.(Maj.) degrees at its meeting on March 19, 2015. The SCIE endorsed the proposal.

Recommendation:

The Senate Committee on Curriculum and Course Changes recommends:

THAT Senate approve revised Academic Regulations on Entrance and Continuation Requirements for the Bachelor of Science (Major) programs, Faculty of Science, effective September 1, 2015.

Respectfully submitted,

Professor G. Smith, Acting Chair
Senate Committee on Curriculum and Course Changes

Report of the Senate Committee on Admissions concerning a proposal from the College of Medicine to amend its admissions policy (2015.03.17)

Preamble:

1. The terms of reference for this committee can be found at: http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/490.htm.
2. The College of Medicine is proposing two changes to its admissions process:
 - i. That the under-representation of individuals who come from socio-economically disadvantaged backgrounds be addressed by advantaging eligible applicants in the admissions process.
 - ii. The number of out-of-province registrants will be reduced from 10% of the annual intake to 5% to facilitate the diversity enhancement.
3. The proposal was approved by the Faculty of Medicine Executive Council on December 13, 2013 and was endorsed by SCADM on March 17, 2015.

Observations:

Socio-economically disadvantaged:

1. Over the past decade there has been substantial attention directed to the need to enhance the diversity of registrants in medical education programs.
2. A Working Group on Enhancing Socioeconomic Diversity (Working Group) was established with membership that was representative of the University of Manitoba and the broader community, with expertise specific to establishing and valuing socio-economic attributes.
3. The outcome of the Working Group and the new procedure being used is reflected in the four tables in Appendix 1.

Reduction of out-of-province registrants:

4. A study conducted in 2011 by the Faculty of Medicine and the Office of Rural and Northern Health entitled *CaRMS and CAPER Data Review – Implications for Physician Recruitment and Retention in Manitoba* identified that during the study period of 1989-2008 only 36% out-of-province students stayed in Manitoba for Postgraduate Medical Education, and 4% chose to stay and practice in Manitoba.
5. Concerns arose regarding the retention of out-of-province registrants given the Mission of the College of Medicine “...[to] plan for the development and delivery of health care services and to help improve health status and service delivery to the Province of Manitoba and the wider community.”

Recommendation:

The Senate Committee on Admissions recommends that the proposal to amend the College of Medicine's admissions policy be approved effective for the September, 2016 intake.

Respectfully submitted

Susan Gottheil, Chair, Senate Committee on Admissions

Comments of the Senate Executive Committee:

The Senate Executive Committee endorses the report to Senate.

Appendix 1

The procedure used in the application process would be as follows:

All applicants will be invited to complete a supplemental questionnaire that would identify family, economic and sociocultural characteristics or attributes, and that a numerical coefficient be applied to an applicant's composite score used to determine invitation to interview and selection for admission.

Numerical coefficients are based upon relative values of specific characteristics and attributes as determined by the Working Group on Enhancing Socioeconomic Diversity, and sufficient to increase the number of registrants with such characteristics or attributes by 5%.

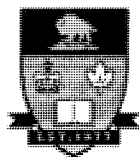
Applicants will be advised that submission of false information may invalidate the application and may result in immediate rejection of the application or expulsion from the College of Medicine.

	CATEGORIES OF ATTRIBUTES	RELATIVE VALUE
1	Family History	0.41
2	Economic Information	0.37
3	Other Sociocultural Determinants	0.22
		1.00

	A. FAMILY HISTORY	RELATIVE VALUE
1	Were you raised by teen parent, or by a single parent due to divorce, death of a parent?	0.09
2	Were you raised by family other than your parents?	0.09
3	Were you ever a child or youth in care?	0.26
4	Has your family ever had an open file with Child and Family Services?	0.16
5	Are you a parent taking care of one or more children on your own?	0.13
6	Did your parents or guardians graduate from college or university?	0.09
7	Were you or your family admitted to Canada with refugee status?	0.18
		1.00

	B. ECONOMIC INFORMATION	RELATIVE VALUE
1	Did you or your family ever have to use a food bank?	0.17
2	Did you or your family ever have to use a homeless shelter?	0.26
3	Did you or your family ever live on social assistance?	0.19
4	During the second decade of your life, was the annual gross income in the household in which you lived less than \$20,000?	0.19
5	During the second decade of your life, was the annual gross income in the household in which you lived between \$20,000-\$40,000?	0.05
6	During the second decade of your life, was the annual gross income in the household in which you lived between \$40,000-\$75,000?	0.01
7	During the second decade of your life, did you have to work to contribute to family income?	0.04
8	Will your parent(s) be paying for the tuition fees if you get accepted to our medical school?	0.05
9	Do you currently receive student aid?	0.02
10	Is your current debt from student aid greater than \$10,000?	0.02
		1.00

	C. OTHER SOCIOCULTURAL DETERMINANTS	RELATIVE VALUE
1	Do you consider yourself to be a member of a Visible Minority?	0.05
2	Do you identify as First Nations, Metis, Inuit or other North American Indigenous ancestry?	0.23
3	Is your primary language other than English or French?	0.09
4	Do you identify as Lesbian, Gay, Bisexual, Intersex, Queer, Transgender, Transsexual or Two Spirit?	0.13
5	Do you have a participation or activity limitation that has an impact on your day-to-day life?	0.17
6	Were you raised or are you living in a household in which there was/is a person living with a disability?	0.10
7	Were you raised or are you living in a household in which there was/is a person living with substance abuse?	0.23
		1.00



UNIVERSITY
OF MANITOBA

Faculty of
Health Sciences

**College of Medicine
Admissions**

S204, 750 Bannatyne
Avenue
Winnipeg, MB R3E 0W2
Phone: 204-789-3499
Fax: 204-272-3169

**A Proposal to the Senate Committee on Admissions
from the College of Medicine
Recommending Revised Admissions Criteria for the
Undergraduate Medical Education Program**

Submitted by:

**Bruce D. Martin, MD
Director, Admissions
College of Medicine
Faculty of Health Sciences
March 13, 2015**

Preamble:

The Faculty of Medicine recommended substantial changes to the admissions policies and procedures in 2008 that were approved by the University Senate and came into effect for the academic year 2009-2010. Those policies and procedures were in the four broad categories of diversity, equity, evidence, and due diligence. Subsequently in 2011 the Faculty of Medicine proposed some minor revisions to the existing policies and also recommended the creation of new admissions streams to advance the MD/PhD Program and to support the creation of a bilingual track within the MD program. Those modifications were approved by the University Senate in 2011 and came into effect for the applicants of the academic year 2012-2013.

At this time the College of Medicine is proposing amendments to the existing admissions policies in the following areas:

1. Enhancing Diversity
2. Reduction of the Out-of-Province Applicant Pool

Observations:

The recommendations for revised admissions criteria are interrelated and contribute to the health human resources necessary for the College to fulfill its social contract. Both components are consistent with the College's commitment to the selection of candidates who have the academic capacity and personal attributes to proceed through the curriculum to successful registration for the practice of medicine.

The observations that support the recommendations are presented in two areas. The appendices include supportive documentation where referenced.

A. Enhancing Diversity

Over the past decade there has been substantial attention directed to the need to enhance the diversity of registrants in medical education programs. There has been growing expression of concern regarding the significant and chronic underrepresentation of some minority groups, and the continued barriers that remain for underrepresented groups to access medical education programs. The American Association of Medical Colleges (AAMC) initially declared in 2003 that:

"underrepresented in medicine" refers to "those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population." and further identified that "medical schools should base their admissions policies on an explicit articulation of legitimate aspirations: to achieve the educational benefits of a diverse student body, including enhancing the cultural competency of all physicians it educates and improving access to care for underserved populations."

The AAMC declared in a subsequent publication in 2010 that:

"Diversity is a student-specific, multi-dimensional concept. It may include, but does not exclusively refer to, race, ethnicity, and gender. Diversity may encompass other dimensions of experiences and attributes, such as distance traveled, educational background, languages spoken, resilience, socioeconomic status, and geography, among others." (Appendix 1.)

An Association of Faculties of Medicine of Canada (AFMC) project entitled *The Future of Medical Education in Canada* (FMEC) released in 2012 identified ten recommendations for MD education. The recommendation specific to admissions called for enhanced admissions processes with the following rationale:

“Evidence is mounting that today’s medical students increasingly hail from the highest income earning families in Canada. Parallel to this, little progress has been made in attracting applicants from First Nations, Inuit, and Métis communities and rural areas. Other sociocultural and economic groups are also underrepresented. In order to meaningfully serve the complex and diverse health care needs of Canadians and meet social accountability objectives, our physician workforce must become more diverse. The diversity needed in Faculties of Medicine includes dimensions such as ethnicity and religion, gender and sexual orientation, geographic origin, socioeconomic status, and a balance between those who desire to practice in generalist disciplines and other specialities.” (Appendix 2.)

Similarly the Committee on Accreditation of Canadian Medical Schools (CACMS) released a document in June 2014 establishing new accreditation standards that included specific reference to diversity as follows:

“A medical school in accordance with its social accountability mission has effective policies and practices in place, and engages in ongoing, systematic, and focused recruitment and retention activities, to achieve mission-appropriate diversity outcomes among its students, faculty, senior academic and educational leadership, and other relevant members of its academic community. These activities include the appropriate use of effective policies and practices, programs or partnerships aimed at achieving diversity among qualified applicants for medical school admission and the evaluation of policy and practices, program or partnership outcomes.” (Appendix 3.)

There has been increased assessment of the diversity of the Canadian medical student population through the administration of the Health Professions Student Diversity Survey (HPSDS) which was first developed and implemented at McGill University in 2009. A recent publication of nine cohorts across four participating medical schools supported the need to develop policies to support people with disabilities, nontraditional gender and sexual identities, individuals of lower socio-economic strata and some populations that included Indigenous peoples, francophone Canadians, other ethnicities and rural students. (Appendix 4.) The University of Manitoba College of Medicine has administered the HPSDS since 2010 and the findings echo those of other Canadian institutions. Additionally, cross-sectional studies by the College of Medicine comparing the diversity of applicants with the diversity of registrants identified that the selection process advantages those of very high socio-economic status, exacerbating the widespread concerns regarding under-representation of individuals from lower-income families; members of visible minorities were proportionately decreased in representation.

In December 2013 the Admissions Committee made representation to the Faculty of Medicine Faculty Executive Council recommending:

That the under-representation of individuals who come from socio-economically disadvantaged backgrounds be addressed by advantaging eligible applicants in the admissions process;

*that the cohort of annual registrants from socio-economically disadvantaged backgrounds be incrementally increased by 5%;
and that the Faculty of Medicine strike a broad-based Working Group to devise a framework for scoring socio-economic attributes and assign relative weights for the attributes using a priority matrix approach.*

The recommendation was unanimously accepted on December 10, 2013. The recommendations aligned with the Mission of the College of Medicine and specifically to the Objectives of the Undergraduate Medical Education Program. (Appendix 5 (a) and (b).) It was felt that the recommendations built upon previous attention that had been directed towards addressing underrepresentation of registrants of Indigenous ancestry, those from rural residency, and individuals living with disabilities.

A Working Group on Enhancing Socioeconomic Diversity (Working Group) was established with membership that was representative of the University of Manitoba and the broader community, with expertise specific to establishing and valuing socio-economic attributes. (Membership of the Working Group is identified in Appendix 6.) Literature was shared regarding medical school admissions and specifically diversity and equity in access to medical education. The Working Group identified by consensus three broad categories of attributes: Family History; Economic Information; and Other Sociocultural Determinants. Characteristics or attributes that were specific to each category were identified by the Working Group that were felt to reflect underrepresentation in the registrants of medical education programs, either by creating barriers to access to education or by disadvantaging applicants in the selection process. Questions were generated such that an applicant could voluntarily self-identity which characteristics or attributes reflected their life circumstances. Questions were approved by consensus and in some circumstances consultation was undertaken beyond the Working Group to provide clarity to the questions or current linguistic terminology. A priority matrix approach (also known as paired comparison analysis or pairwise comparison) was used to assign relative value to each characteristic or attribute within each category, and the three categories were similarly assigned relative value. This approach has been used by the College of Medicine to value attributes of applicants with rural connections and advanced academic credentials. (Appendix 7.)

The outcome of the Working Group is reflected in the following four tables:

	CATEGORIES OF ATTRIBUTES	RELATIVE VALUE
1	Family History	0.41
2	Economic Information	0.37
3	Other Sociocultural Determinants	0.22
		1.00

	A. FAMILY HISTORY	RELATIVE VALUE
1	Were you raised by a teen parent, or by a single parent due to divorce, death of a parent?	0.09
2	Were you raised by family other than your parents?	0.09
3	Were you ever a child or youth in care?	0.26
4	Has your family ever had an open file with Child and Family Services?	0.16
5	Are you a parent taking care of one or more children on your own?	0.13
6	Did your parents or guardians graduate from college or university?	0.09
7	Were you or your family admitted to Canada with refugee status?	0.18
		1.00

	B. ECONOMIC INFORMATION	RELATIVE VALUE
1	Did you or your family ever have to use a food bank?	0.17
2	Did you or your family ever have to use a homeless shelter?	0.26
3	Did you or your family ever live on social assistance?	0.19
4	During the second decade of your life, was the annual gross income in the household in which you lived less than \$20,000?	0.19
5	During the second decade of your life, was the annual gross income in the household in which you lived between \$20,000-\$40,000?	0.05
6	During the second decade of your life, was the annual gross income in the household in which you lived between \$40,000-\$75,000?	0.01
7	During the second decade of your life, did you have to work to contribute to family income?	0.04
8	Will your parent(s) be paying for the tuition fees if you get accepted to our medical school?	0.05
9	Do you currently receive student aid?	0.02
10	Is your current debt from student aid greater than \$10,000?	0.02
		1.00

	C. OTHER SOCIOCULTURAL DETERMINANTS	RELATIVE VALUE
1	Do you consider yourself to be a member of a Visible Minority?	0.05
2	Do you identify as First Nations, Metis, Inuit or other North American Indigenous ancestry?	0.23
3	Is your primary language other than English or French?	0.09
4	Do you identify as Lesbian, Gay, Bisexual, Intersex, Queer, Transgender, Transsexual or Two Spirit?	0.13
5	Do you have a participation or activity limitation that has an impact on your day-to-day life?	0.17
6	Were you raised or are you living in a household in which there was/is a person living with a disability?	0.10
7	Were you raised or are you living in a household in which there was/is a person living with substance abuse?	0.23
		1.00

The procedure used in the application process would be as follows:

All applicants will be invited to complete a supplemental questionnaire that would identify family, economic and sociocultural characteristics or attributes, and that a numerical coefficient be applied to an applicant's composite score used to determine invitation to interview and selection for admission.

Numerical coefficients are based upon relative values of specific characteristics and attributes as determined by the Working Group on Enhancing Socioeconomic Diversity, and sufficient to increase the number of registrants with such characteristics or attributes by 5%.

Applicants will be advised that submission of false information may invalidate the application and may result in immediate rejection of the application or expulsion from the College of Medicine.

B. Reduction of the Out-Of-Province Applicant Pool

The Admissions Committee gives priority to Manitoba residents who are considered within the Manitoba Applicant Pool. The Applicant Information Bulletin identifies that "The College of Medicine welcomes applicants from all provinces and territories. The Admissions Committee defines Out-of-Province applicants as those who are a citizen or permanent resident of Canada but are not a resident of Manitoba." Up to 10% of an incoming class will be accepted from this pool on an annual basis in accordance with admissions policies and processes.

A comparison with other western provinces identifies the following:

University of British Columbia:

"Preference is given to residents of British Columbia; however, a small number of out-of-province applicants are accepted each year." In 2014, 6.5% of the incoming cohort was from out-of-province.

University of Alberta:

"Admission to the MD program is limited and applications are selected on a competition basis. Eighty-five per cent of the places in the program are normally reserved for Alberta residents, and 15 per cent are usually available for non-Alberta residents."

University of Calgary:

There is no explicit statement in their Applicant Brochure but in 2014 it was stated that: *"Eighty-five percent of year one positions were filled by residents of Alberta."*

University of Saskatchewan:

The Applicant Information Bulletin identifies that *"10% of positions may be offered to out-of-province applicants."*

A study conducted in 2011 by the Faculty of Medicine and the Office of Rural and Northern Health entitled *CaRMS and CAPER Data Review – Implications for Physician Recruitment and Retention in Manitoba* identified that during the study period of 1989-2008 only 36% out-of-province students stayed in Manitoba for Postgraduate Medical Education, and 4% chose to stay and practice in Manitoba. Concerns arose regarding the retention of out-of-province registrants given the Mission of the College of Medicine " *...[to] plan for the development and delivery of health care services and to help improve health status and service delivery to the Province of Manitoba and the wider community.*"

Accordingly in December 2013 the Admissions Committee made representation to the Faculty of Medicine Faculty Executive Council recommending:

That Out-of-Province registrants be reduced from 10% of the annual intake to 5%.

The recommendation was accepted on December 10, 2013.

Recommendations:

The College of Medicine recommends to the Senate Committee on Admissions that:

The diversity of registrants in the College of Medicine MD Program be enhanced by advantaging eligible applicants who have characteristics or attributes that may have contributed to the historical underrepresentation of such individuals in medical education programs; and

Out-of-province registrants will be reduced from 10% of the annual intake to 5% to facilitate the diversity enhancement.

APPENDICES

Appendix 1. American Association of Medical Colleges (AAMC) Publications

Roadmap to Diversity: Key Legal and Educational Policy Foundations for Medical Schools. 2008

Key Points about the AAMC's "Underrepresented in Medicine" Definition (June 2003)

According to the AAMC, "underrepresented in medicine" refers to "those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population." Although this definition may be an appropriate benchmark to gauge progress regarding access and diversity nationally or regionally, the AAMC has cautioned that this definition cannot serve the purpose as the "driver of institutional admissions policies." Instead, "medical schools should base their admissions policies on an explicit articulation of legitimate aspirations: to achieve the educational benefits of a diverse student body, including enhancing the cultural competency of all physicians it educates and improving access to care for underserved populations."

SOURCES: AAMC memorandum, "The status of the new AAMC definition of 'underrepresented in medicine' following the Supreme Court's decision in *Grutter*." at <http://www.aamc.org/meded/urm/statusofnewdefinition.pdf> .

http://www.cossa.org/diversity/reports/Key_Legal_and_Policy_Foundations_for_Medical_Schools.pdf Accessed March 11, 2015.

Roadmap to Diversity: Integrating Holistic Review Practices into Medical School Admission Processes. 2010

Roadmap to Diversity: Integrating Holistic Review Practices into Medical School Admission Processes is the second in a series of publications to be produced by the AAMC Holistic Review Project intended to help medical schools establish and implement institution-specific, diversity-related policies that will advance their core educational goals with minimal legal risk.

Diversity is not an end goal, but a means to achieving core educational goals as defined by the medical school.

- As such, diversity serves as a driver of educational excellence and a mechanism for graduating physicians that contribute to health care consistent with institutional mission. Diversity is a student-specific, multi-dimensional concept.
 - It may include, but does not exclusively refer to, race, ethnicity, and gender. Diversity may encompass other dimensions of experiences and attributes, such as distance traveled, educational background, languages spoken, resilience, socioeconomic status, and geography, among others.
- Diversity is not a "one-size-fits-all" concept, but an inherently institution-specific concept.
- While likely sharing common elements, the diversity interests of one medical school may be quite different from those of another school, based on differences in institutional mission, educational goals, the kind of students a medical school wants to educate, and the kind of physicians it wants to graduate.

<https://members.aamc.org/eweb/upload/Roadmap%20to%20Diversity%20Integrating%20Holistic%20Review.pdf> Accessed March 11, 2015.

Appendix 2.

The Future of Medical Education in Canada (FMEC): *A Collective Vision for MD Education*

An AFMC project
www.afmc.ca/fmec

March 2012

From the Executive Summary:

“FMEC recommendations for MD education (also known as undergraduate medical education) are grounded in evidence and emerge from a broad and rigorous consultative process. They are as follows:

1. Address Individual and Community Needs
2. Enhance Admissions Processes
3. Build on the Scientific Basis of Medicine
4. Promote Prevention and Public Health
5. Address the Hidden Curriculum
6. Diversify Learning Contexts
7. Value Generalism
8. Advance Inter- and Intra-Professional Practice
9. Adopt a Competency-Based and Flexible Approach
10. Foster Medical Leadership

They are accompanied by five enabling recommendations that will facilitate the implementation of the FMEC recommendations:

- A. Realign Accreditation Standards
 - B. Build Capacity for Change
 - C. Increase National Collaboration
 - D. Improve the Use of Technology
 - E. Enhance Faculty Development”
-

Recommendation 2: Enhance Admissions Processes

Given the broad range of attitudes, values, and skills required of physicians, Faculties of Medicine must enhance admissions processes to include the assessment of key values and personal characteristics of future physicians—such as communication, interpersonal and collaborative skills, and a range of professional interests—as well as cognitive abilities. In addition, in order to achieve the desired diversity in our physician workforce, Faculties of Medicine must recruit, select, and support a representative mix of medical students.

Rationale

Selecting the most appropriate candidates is one of the greatest challenges in medical education. While Faculties of Medicine have long appreciated the need to incorporate factors that go beyond academic achievement into their selection processes, the changing nature of medical practice and of Canadian society has made non-academic characteristics even more critical. Evidence is mounting that today's medical students increasingly hail from the highest income earning families in Canada. Parallel to this, little progress has been made in attracting applicants from First Nations, Inuit, and Métis communities and rural areas. Other sociocultural and economic groups are also underrepresented. In order to meaningfully serve the complex and diverse health care needs of Canadians and meet social accountability objectives, our physician workforce must become more diverse. The diversity needed in Faculties of Medicine includes dimensions such as ethnicity and religion, gender and sexual orientation, geographic origin, socioeconomic status, and a balance between those who desire to practice in generalist disciplines and other specialities. Achieving this diversity means attracting an applicant base that is more representative of the Canadian population. This will involve, for example, addressing perceived and real barriers to medical education, such as the high debt loads of medical graduates. It will also involve enhancing admission processes to value non-academic characteristics such as interpersonal and emotional acumen, without sacrificing academic excellence.

The Way Forward

Examples of strategies for addressing this recommendation include the following:

- Customize admissions criteria to align them more closely with each faculty's social accountability mandate.
- Develop and research new admissions tool kits that have meaningful predictive value for desired future medical practice attributes.
- Develop pipeline programs that connect students from underrepresented communities with the medical education system.
- Mount a research agenda that assesses the impact of modified admissions criteria against the impetus for their modification.
- Value and profile diverse academic faculty members as leaders and mentors in order to attract a more diverse applicant base.
- Work with provincial/federal governments to monitor student debt- management and create policies that encourage a broad range of applicants.

https://www.afmc.ca/future-of-medical-education-in-canada/medical-doctor-project/pdf/collective_vision.pdf

Accessed March 11, 2015

Appendix 3.



Committee on Accreditation of Canadian Medical Schools
Comité d'agrément des facultés de médecine du Canada

CACMS STANDARDS AND ELEMENTS

Standards for Accreditation of Medical Education Programs Leading to the M.D. Degree June 2014

Standards and Elements Effective July 1, 2015

Standard 3: Academic and Learning Environments

A medical school ensures that its medical education program occurs in professional, respectful, and intellectually stimulating academic and clinical environments, recognizes the benefits of diversity, and promotes students' attainment of competencies required of future physicians.

3.3 Diversity/Pipeline Programs and Partnerships

A medical school in accordance with its social accountability mission has effective policies and practices in place, and engages in ongoing, systematic, and focused recruitment and retention activities, to achieve mission-appropriate diversity outcomes among its students, faculty, senior academic and educational leadership, and other relevant members of its academic community. These activities include the appropriate use of effective policies and practices, programs or partnerships aimed at achieving diversity among qualified applicants for medical school admission and the evaluation of policy and practices, program or partnership outcomes.

Standard 10: Medical Student Selection, Assignment, and Progress

A medical school establishes and publishes admission requirements for potential applicants to the medical education program, and uses effective policies and procedures for medical student selection, enrollment, and assignment.

10.1 Premedical Education/Required Coursework

Through its requirements for admission, a medical school encourages potential applicants to the medical education program to acquire a broad undergraduate education that includes the study of the humanities, natural sciences, and social sciences, and confines its specific premedical course requirements to those deemed essential preparation for successful completion of its medical curriculum.

10.2 Final Authority of Admission Committee

The final responsibility for accepting students to a medical school rests with a formally constituted admission committee. The authority and composition of the committee and the rules for its operation, including voting privileges and the definition of a quorum, are specified in bylaws or other medical school policies. Faculty members constitute the majority of voting members at all meetings. The selection of individual medical students for admission is not influenced by any political or financial factors.

10.3 Policies Regarding Student Selection/Progress and their Dissemination

The faculty of a medical school establish criteria for student selection and develop and implement effective policies and procedures regarding, and make decisions about, medical student application, selection, admission, assessment, promotion, graduation, and any disciplinary action. The medical school makes available to all interested parties its criteria, policies, and procedures regarding these matters.

10.4 Characteristics of Accepted Applicants

A medical school selects applicants for admission who possess the intelligence, integrity, and personal and emotional characteristics necessary for them to become competent physicians.

10.5 Technical Standards

A medical school develops and publishes technical standards for the admission, retention, and graduation of applicants or medical students with disabilities, in accordance with legal requirements.

https://www.afmc.ca/pdf/CACMS_Standards_and_Elements_June_2014_Effective_July2015.pdf
Accessed March 11, 2015.

Appendix 4.

Acad Med. 2012 Nov;87(11):1501-10. doi: 10.1097/ACM.0b013e31826daf74.

Calling for a broader conceptualization of diversity: surface and deep diversity in four Canadian medical schools.

Young ME¹, Razack S, Hanson MD, Slade S, Varpio L, Dore KL, McKnight D.

¹Centre for Medical Education, Faculty of Medicine, McGill University, Montreal, Quebec, Canada. meredith.young@mcgill.ca

Abstract

PURPOSE:

Policy groups recommend monitoring and supporting more diversity among medical students and the medical workforce. In Canada, few data are available regarding the diversity of medical students, which poses challenges for policy development and evaluation. The authors examine diversity through a framework of surface (visible) and deep (less visible) dimensions and present data regarding a sample of Canadian medical students.

METHOD:

Between 2009 and 2011, nine cohorts from four Canadian medical schools completed the Health Professions Student Diversity Survey (HPSDS) either on paper or online. Items asked each participant's age, gender, gender identity, sexual identity, marital status, ethnicity, rural status, parental income, and disability. Data were analyzed descriptively and compared, when available, with national data.

RESULTS:

Of 1,892 students invited, 1,552 (82.0%) completed the HPSDS. Students tended to be 21 to 25 years old (68.3%; 1,048/1,534), female (59.0%; 902/1,529), heterosexual (94.6%; 1,422/1,503), single (90.1%; 1,369/1,520), and unlikely to report any disability (96.5%; 1,463/1,516). The majority of students identified with the gender on their birth certificate (99.8%; 1,512/1,515). About half had spent the majority of their lives in urban environments (46.7%; 711/1,521), and most reported parental household incomes of over \$100,000/year (57.6%; 791/1,373). Overall, they were overrepresentative of higher-income groups and underrepresentative of populations of Aboriginal, black, or Filipino ethnicities in Canada.

CONCLUSIONS:

The authors propose the development of a National Student Diversity Database to support both locally relevant policies regarding pipeline programs and an examination of current application and selection procedures to identify potential barriers for underrepresented students

Appendix 5(a). College of Medicine Mission

- To develop, deliver and evaluate high quality educational programs for undergraduate and postgraduate students of medicine and medical rehabilitation, for graduate students and postdoctoral fellows in basic medical sciences and for physicians to practice.
- To conduct research and other scholarly enquiry into the basic and applied medical sciences.
- To provide advice, disseminate information to health professions and plan for the development and delivery of health care services and to help improve health status and service delivery to the Province of Manitoba and the wider community.

http://umanitoba.ca/faculties/health_sciences/medicine/dean/mission.html Accessed March 11, 2015.

Appendix 5(b). Undergraduate Medical Education Mission

To develop, deliver and evaluate a high quality educational program for the MD Program.

VALUES

Our Graduates will approach their profession with a spirit of Discovery by:

- Welcoming and adapting to the ever-changing nature of medicine
- Appreciating the continuum of basic science and human wellness
- Building a broad and unbiased foundation of medical knowledge
- Maintaining openness to practice medicine and conduct broader academic work in urban hubs and in rural and Northern communities, in Canada and around the world

Our Graduates will embrace Scholarship by:

- Pursuing academic excellence at every stage of their careers as clinicians, researchers, academics, and administrators
- Appropriately applying medical research and innovation to patient care
- Committing to the practice of lifelong learning as professionals
- Committing to the lifelong maintenance of an evidence-based practice
- Healing through knowledge and compassion and acting as educators for patients, allied health professionals, and one another

Our Graduates will lead and collaborate within their communities by:

- Advocating for the health and safety needs of individual patients and collective populations
- Communicating effectively with all health care professionals, including generalists, specialists, and allied professionals and those in related sectors
- Exemplifying professionalism and sustaining a climate of respect in all aspects of their lives
- Fostering an atmosphere of cultural safety for all patients and populations by practicing with open-mindedness and unconditional goodwill.
- Providing expert and compassionate medical care to diverse patient populations in Canada and beyond
- In doing so, graduates of the Faculty of Medicine at the University of Manitoba will become exemplary physicians prepared to undertake the responsibilities entrusted to them

http://umanitoba.ca/faculties/health_sciences/medicine/education/undergraduate/ugme_mission_objectives.html Accessed March 11, 2015.

Appendix 6. Admissions Committee Working Group on Enhancing Socioeconomic Diversity

Chairperson

Dr. B. Martin. Director, Admissions, College of Medicine, Faculty of Health Sciences, University of Manitoba

Members

Mr. Jeff Adams. Executive Director, Enrolment Services, University of Manitoba

Dr. Francis Amara. Associate Professor, Biochemistry & Medical Genetics, Inaugural Director, Biomedical Youth Program & Inner-City Science Centre, University of Manitoba

Dr. Fred Aoki. Professor of Medicine, Medical Microbiology and Pharmacology & Therapeutics; former Assistant Dean, Admissions, Faculty of Medicine; University of Manitoba.

Mr. Donald Benham. Director, Hunger & Poverty Awareness, Winnipeg Harvest

Ms. Adrienne Carriere. Associate Area Director, Access & Aboriginal Focus Programs, Extended Education, University of Manitoba

Ms. Lindsay Filz. Clinical Pharmacist, St Boniface Hospital

Dr. Daniel Klass. Former Associate Registrar and Quality Management Director, College of Physicians and Surgeons of Ontario

Mr. David Northcott. Executive Director, Winnipeg Harvest

Ms. Alana Poon. Medical Student Representative, College of Medicine Admissions Committee

Dr. Noralou Roos. Director, EvidenceNetwork.ca, Manitoba Centre for Health Policy, College of Medicine, Faculty of Health Sciences, University of Manitoba

Ms. Lindsay Smith. Director Human Resources and Volunteer Services, Siloam Mission

Administrative Support

Ms. Jessica Ivanko. Admissions Administrator, College of Medicine

Ms. Fitri. Gagne. Assistant, Admissions, College of Medicine

Appendix 7.

Rural Remote Health. 2011;11(2):1646. Epub 2011 May 23.

Increasing the enrolment of rural applicants to the faculty of medicine and addressing diversity by using a priority matrix approach to assign values to rural attributes.

Raghavan M¹, Martin BD, Roberts D, Aoki F, MacKalski BA, Sandham JD.

¹University of Manitoba Faculty of Medicine, Winnipeg, Manitoba, Canada.

Abstract

In an external review of the admissions process for the Faculty of Medicine, University of Manitoba, Canada, it was suggested that admissions policies be modified to increase the enrolment of students more likely to practise in rural locations, by selecting a cohort of students with attributes reflecting potential for rural practice. A broad-based Working Group devised a framework for scoring personal attributes reflecting a potential for living and working in rural areas. This framework, based on established characteristics reported in the literature, valued applicants who had rural connections, a history of rural employment, a history of rural community service, or a combination of these attributes. Relative weights for the attributes were determined using a priority matrix approach. Historic admissions data, comprising applicants' rural origin (defined only by location of high school graduation), composite scores, and ranking, were reanalyzed to identify the magnitude of numerical constants that, when applied to composite scores, enhanced the relative ranking of eligible rural-origin applicants. This resulted in a hypothetical 29%-33% increase in the number of rural-origin students in incoming classes in those years. In the inaugural year of implementation of the policy and methodology, 60 admission offers (44.1%) were made to applicants with one or more rural attributes. Without adjustments, only 49 applicants with rural attributes (36%) would have been offered admission. This methodology resulted in a 22.4% increase in admission offers to applicants with rural attributes, and ushered in an incoming class that was more representative of the province's rural-urban demographics than in previous years. This methodology, although focused on rurality, could be equally applicable to any attribute, and to achieve greater diversity and equity among medical school applicants.

Report of the Senate Committee on Admissions concerning a proposal from the College of Nursing to amend its admissions policy (2015.03.17)

Preamble:

1. The terms of reference for this committee can be found at: http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/490.htm.
2. The College of Nursing is proposing a change to its admissions policy regarding applicants to the Bachelor of Nursing program who had graduated with a Bachelor of Nursing degree in Canada or the United States.
3. The proposal was approved by the College of Nursing Council on January 28, 2015 and was endorsed by SCADM on March 17, 2015.

Observations:

1. Graduates of a Bachelor of Nursing or equivalent program who do not pass national registration exams are not eligible for registration with the regulatory body and therefore cannot practice as a Registered Nurse.
2. Currently, graduates from the University of Manitoba or equivalent program within Canada or the United States may apply to the Bachelor of Nursing program to repeat the same or essentially the same program and graduate with another Bachelor of Nursing degree.
3. The Bachelor of Nursing program is in high demand, and admission to the program is competitive. The College of Nursing wishes to admit new students who have not already graduated with a Bachelor of Nursing degree.
4. The new policy would be:
Applicants who have previously completed a Bachelor of Nursing or equivalent program in Canada or the United States are not eligible for admission to the Bachelor of Nursing program in the College of Nursing at the University of Manitoba. In exceptional circumstances students may be considered on a case-by-case basis.

Recommendation:

The Senate Committee on Admissions recommends that the proposal to amend the College of Nursing's admissions policy be approved effective for the September, 2016 intake.

Respectfully submitted
Susan Gottheil, Chair, Senate Committee on Admissions

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

University of Manitoba - College of Nursing

Proposed New Policy – for Implementation September 2016

Applicants to the Bachelor of Nursing Program with a Previous Bachelor of Nursing Degree

The College of Nursing is proposing a new policy regarding applicants to the Bachelor of Nursing program who had graduated with a Bachelor of Nursing degree in Canada or the United States.

Background

Graduates of a Bachelor of Nursing or equivalent program who do not pass national registration exams are not eligible for registration with the regulatory body and therefore cannot practice as a Registered Nurse. Regulatory bodies direct these individuals to repeat a Bachelor of Nursing or equivalent program and then re-write the registration exams. Currently, graduates from the University of Manitoba or equivalent program within Canada or the United States may apply to the Bachelor of Nursing program to repeat the same or essentially the same program and graduate with another Bachelor of Nursing degree.

The Bachelor of Nursing program is in high demand, and admission to the program is competitive. In 2013, there were 502 applicants for 240 spaces, and in 2014, there were 461 applicants. The College of Nursing wishes to admit new students who have not already graduated with a Bachelor of Nursing degree.

Proposed Admission Policy:

Applicants who have previously completed a Bachelor of Nursing or equivalent program in Canada or the United States are not eligible for admission to the Bachelor of Nursing program in the College of Nursing at the University of Manitoba. In exceptional circumstances students may be considered on a case-by-case basis.

Observations:

1. The College of Nursing has a responsibility to offer the Bachelor of Nursing program to new students who may potentially become practicing members of the nursing profession.
2. The College of Nursing wishes to limit enrollment to applicants who have not already graduated from a Bachelor of Nursing program.

S:\Committees\Advance Standing and Admissions Committee\Policies\Applicants with a Previous Bachelor of Nursing Degree – revised March, 2015

**Report of the Senate Committee on Course and Curriculum Changes Part B -
Major Curriculum Revisions, Department of Mathematics, Faculty of Science**

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 meetings on October 15 and October 27, 2014, and March 25, 2015, the Committee considered a proposal from the Faculty of Science, for major modifications to the curricula of undergraduate programs offered by the Department of Mathematics, including the following programs:
 - Bachelor of Science (Honours) in Mathematics
 - Bachelor of Science (Major) in Mathematics
 - Bachelor of Science (Double Honours) in Mathematics
 - Bachelor of Science (Major) in Applied Mathematics – Computer Science Option
 - Bachelor of Science (Major) in Applied Mathematics – Economics Option
 - Bachelor of Science (Major) in Applied Mathematics – Statistics Option
 - Bachelor of Science (General) in Mathematics
 - Minor in Mathematics
 - Bachelor of Science (Joint Honours) in Mathematics – Computer Science
 - Bachelor of Science (Joint Honours) in Mathematics – Economics
 - Bachelor of Science (Joint Honours) in Mathematics – Physics and Astronomy
 - Bachelor of Science (Joint Honours) in Mathematics - Statistics

Observations

1. The Committee considered a proposal from the Faculty of Science, for major modifications to the curricula of undergraduate programs offered by the Department of Mathematics. The proposed modifications respond to recommendations made in an undergraduate program review completed in 2009, including recommendations to: (i) develop a common set of core courses, to be used in Honours and Major programs; (ii) review all courses to eliminate duplication of material, (iii) develop and introduce new courses to reflect the current strengths of faculty in the Department, (iv) eliminate 6 credit hour spanned courses.
2. The modifications will be carried out in two phases. Phase 1 is concerned with courses that are required for Major and Honours programs, including Joint Honours programs, and modification of all Mathematics programs. Phase 2 will entail a review of service courses, including courses offered for Engineering students, and will involve broad consultation with other departments and faculties that make use of the courses. Any course and curriculum changes that would arise from Phase 2 would be implemented in

the 2017 Fall Term. This report concerns only Phase 1 modifications, which are to be implemented in September 2015.

3. In addition to the program modifications listed above, the proposed curriculum modifications involve the introduction of forty-seven (47) courses, the deletion of forty-seven (47) courses, and the modification of ten (10) courses, as set out in the attachment to this report. The overall number of credit hours in course offerings would be reduced by thirty-six (36) credit hours.
4. Proposed course modifications do not include modifications to Mathematics courses for Engineering programs or the following services courses: MATH 1200 – Elements of Discrete Mathematics, MATH 1300 – Vector Geometry and Linear Algebra, MATH 1500 – Introduction to Calculus, MATH 1700 – Calculus 2, or MATH 2720 – Multivariable Calculus. These courses may be revised during Phase 2.
5. Significant program modifications include the restructuring of four-year degree programs to include a common set of core courses, to facilitate students' movement between programs, including from a Major to an Honours program or vice versa.
6. The Department is also proposing to introduce four 1000- level Mathematics courses that are intended for students planning to enter an Honours or Major program in Mathematics: MATH 1220 – Linear Algebra 1, MATH 1230 – Differential Calculus, MATH 1232 Integral Calculus, and MATH 1240 – Elementary Discrete Mathematics. The courses, which would be more rigorous than, and which would be offered in addition to, MATH 1200, MATH 1300, MATH 1500, and MATH 1700, would be required for entrance to the Major and Honours programs in Mathematics.
7. Students who complete the current first year courses could qualify for admission to a Major or Honours program with the following substitutions, provided that they achieve the minimum grade indicated in brackets: MATH 1300 (B) in place of MATH 1220; MATH 1500 (B) or MATH 1510 (B) in place of MATH 1230; MATH 1700 (B) or MATH 1710 (B) in place of MATH 1232; MATH 1690 (C+) in place of MATH 1230 and MATH 1232. The Department would also recommend that these students complete a self-study tutorial, to be offered online, that would cover materials included in the Major/Honours stream courses but not in the current introductory courses.
8. Phase 1 of the curriculum modifications would be implemented in full in the 2015/2016 Academic Session rather than being phased in over several years. Thus, both continuing and entering students would complete the revised Mathematics curricula. The Department has developed a transition plan, including a detailed course mapping, to transition continuing students from current to revised curricula. In addition, Student Advisors would work with each student to develop a completion plan for their program. At present, there are forty-nine (49) students in Years 2 through 4 of the various four-year degree programs.
9. The proposed curriculum modifications would not require additional resources. It is anticipated that there would be a reduction of four – six course sections annually, as compared to the current curriculum. Also, in order to effectively use existing resources, a number of courses would be offered every second year. This has been taken into account when establishing course prerequisites and would also be considered when scheduling course offerings each year, to ensure that students would be able to meet the requirements of their program within four years.

10. The Library has indicated that current collections can support the proposed course introductions.

Recommendation

The Senate Committee on Curriculum and Course Changes recommends:

THAT Senate approve undergraduate curriculum and course changes proposed by the Department of Mathematics, Faculty of Science, as set out in the attachment, effective September 1, 2015.

Respectfully submitted,

Professor G. Smith, Acting Chair
Senate Committee on Curriculum and Course Changes

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

**MATHEMATICS
COURSE AND PROGRAM MODIFICATIONS
EFFECTIVE FALL 2015
SUMMARY**

The external review of the undergraduate program of the Department of Mathematics was completed in November 2009, providing eighteen specific recommendations. Following these recommendations, the department developed a proposal for comprehensive review of the undergraduate curriculum. The proposal for the honours and four year major mathematics programs was evaluated externally in June 2013. The department has taken into account these reviews and expanded the proposal to many other programs that are affected.

Phases and time points of the review

Phase 1 (to be implemented beginning Fall 2015) - Revision of mathematics programs and other mathematically involved (except Engineering) programs

At this Phase, we plan to delete almost fifty mathematics courses except MATH 1200, MATH 1300, MATH 1500, MATH 1700, MATH 2720, and Engineering mathematics courses. At the same time, we plan to introduce 47 new mathematics courses. Key features of the revised curriculum are: elimination of duplication of the material (in particular, there is no multiple versions of the same course for major and honour students, such as, for example MATH 2300 and MATH 2352, MATH 2720 and MATH 2750, MATH 3740 and MATH 3760); a small set of core mathematics courses that would be required in any mathematics program to facilitate movements between programs and simplify student advising; increased overall level of exposition, new rigorous first-year mathematics courses.

This document describes the Phase 1 of the revision in detail. We would like to emphasize that **Math 1300, Math 1500, Math 1700, Math 2720, and engineering mathematics courses will remain to be offered at this Phase**, but may be revised in Phase 2. Any departments/programs using current 2000- and higher-level mathematics courses have been advised to switch to the proposed new first year mathematics courses (see "Other programs" section of this document). Notes on transition to the new programs are in the "Transition" section of this document.

Phase 2 (to be implemented beginning with Fall 2016) - Revision of remaining courses, in particular of MATH 1300, MATH 1500, MATH 1700, and Engineering mathematics courses.

Material of MATH 1300, MATH 1500 and MATH 1700 may be adjusted to match that of MATH 1220, MATH 1230, MATH 1232, but taught on a lower level. Many university programs would need to be modified at this Phase, allowing new first year courses as alternatives to MATH 1300, MATH 1500 and MATH 1700. Engineering mathematics courses to be reviewed. In particular, applied (rather than theoretical) courses in multivariable calculus, numerical analysis, introductory differential equations are created (or corresponding engineering mathematics courses are modified to serve wider audience, in which case certain portion of seats is reserved for engineering students only). At this Phase, M-requirement courses MATH 1010 and MATH 1020 may also be revised.

Other remarks

MATH 1690 remains in the calendar in Phase 1, but will not be offered in 2015/2016 academic year. Formal deletion will be carried out at Phase 2. We have not offered MATH 1690 since

2008. New courses MATH 1230 and MATH 1232 will serve the purpose of MATH 1690.

MATH 1200 remains in the calendar in Phase 1, but will likely not be offered at all or offered with a smaller enrollment/section count in 2015/2016 academic year. Formal deletion will be carried out at Phase 2. Among the programs that are not specifically described in this document, MATH 1200 is a required course only in Physics four year major and Statistics honours and four year major programs. Physics and Statistics are proposing course and program modifications that will use MATH 1240 in place of MATH 1200. Several other programs have MATH 1200 as elective. Other courses satisfying such elective requirements (e.g., listing at least two of MATH 1300, MATH 1500, MATH 1700) will remain to be taught, so such elective requirements can be satisfied even if MATH 1200 is not offered. The department will inform and consult with the corresponding units and increase enrollment in MATH 1300, MATH 1500, MATH 1700 accordingly to compensate for possible reduction or cancellation of MATH 1200.

MATH 2720 remains in the calendar in Phase 1, but is modified to be restricted to be used by students in Actuarial Mathematics programs only. The new multivariable calculus course MATH 2150 needs MATH 2080 as a prerequisite, but there is no room to require MATH 2080 in Actuarial Mathematics programs. Therefore, MATH 2720 will continue to be used by Actuarial Mathematics programs, but all other students will be taking the new MATH 2150. As mentioned, in Phase 2, an applied multivariable calculus course will be developed that will replace the role of MATH 2720 in Actuarial Mathematics programs.

Courses that are planned to be offered every second year are specifically listed as required or elective courses only in the proposed Mathematics Honours program. The prerequisites and the offerings are structured in such a way that students can fulfill the requirements of the program regardless of whether they begin the program in an odd or an even year, see Mathematics Honours and Mathematics 4 Year Major section of this document for more details.

- **Entry requirements and acceptability of MATH 1300, MATH 1500, MATH 1700 in the proposed programs**

We propose to simplify entry requirements for the new programs to be:

- MATH 1232 (B) or MATH 1690 (B) or MATH 1700 (A) for honours programs;
- MATH 1232 (C+) or MATH 1690 (C+) or MATH 1700 (B) for major programs.

Requirement of one course for program entry will be consistent with current practices in other departments of the Faculty of Science. No further grade requirements in any courses (except needed for some prerequisites) will be imposed compared to the Faculty of Science regulations (C in each course for Honours, and C in each program specific course for Majors). The current first year courses MATH 1300, MATH 1500 and MATH 1700 would continue to run, and will be accepted in new programs, but with higher grade requirements. For example, whenever MATH 1232 (C) is a prerequisite, MATH 1700 (B) can be used. Students in the new mathematics programs will be strongly advised to complete new first year mathematics courses. To help the students who entered our programs with the old (current) 1st year math courses instead of the new ones, we will introduce a web-based self-study resource that covers the difference of material, familiarizes with proofs, epsilon-deltas, etc., possibly includes some consultations by a faculty member or a grad student (help centre).

Calculation of teaching resources

All courses that are not affected by the first phase of the curriculum revision will remain to be run in 2015/16 academic year, in particular: MATH 1010, MATH 1020, MATH 1210, MATH 1300, MATH 1500, MATH 1510, MATH 1520, MATH 1700, MATH 1710, MATH 2120, MATH 2130, MATH 2132, MATH 2720, MATH 3120, MATH 3132.

All courses to be introduced are 3 credit hour courses. Some extra sections may be offered in the summer term. The calculations below refer to the regular Fall and Winter terms of an academic year, reflecting a minimum offering.

List of new courses for which we will offer **one section per year**: MATH 1220, MATH 1230, MATH 1232, MATH 1240, MATH 2020, MATH 2030, MATH 2040, MATH 2070, MATH 2080, MATH 2090, MATH 2140, MATH 2150, MATH 2160, MATH 2170, MATH 2180, MATH 3320, MATH 3322, MATH 3330, MATH 3340, MATH 3360, MATH 3380, MATH 3390, MATH 3420, MATH 3440, MATH 3460, MATH 3470, MATH 3472, MATH 4260, MATH 4270, MATH 4280, MATH 4290, MATH 4370, MATH 4440, MATH 4450. Total: 34 sections = **102** credit hours per year.

List of new courses for which we will offer **one section per two years**: MATH 3370, MATH 3410, MATH 3480, MATH 4240, MATH 4320, MATH 4330, MATH 4340, MATH 4360, MATH 4390, MATH 4460, MATH 4470, MATH 4300, MATH 4380. Total: 13 sections per two years = 6.5 sections per year = **19.5** credit hours per year.

Some courses to be deleted run irregularly or every other year. To calculate the number of credit hours to be deleted, we will use the average number of sections offered in the past two academic years (2012/13 and 2013/14). The table is shown in the next page. The total number of credit hours per academic year is **133.5**.

Net change in credit hours: $102 + 19.5 - 133.5 = -12$, saving approximately 4 sections per year compared with current offering.

Note that:

- We may have to offer more than one section of the new first and second year courses if they will be required in programs of other departments, or we may need more sections of some service courses (for example, service multivariable calculus). On the other hand, enrolment in current MATH 1300, MATH 1500, MATH 1700 may be decreased as some students will take new courses.
- We intend to maintain the practice of assigning three sections per year to research active faculty members, which is currently achieved through offering "super" sections of service courses with very large enrolment. We plan to come back to the regular size of the sections while maintaining the three sections per year teaching load for research active faculty members.
- We would like to reduce the number of sessional instructors, which may be required in case of significant budget cuts.
- If any of the specialized courses that are currently planned to run once every two years will become popular, we will try to increase the frequency of the offering.

Even with saving 6 sections per year due to the switch to the new curriculum, and with potential new faculty members, all of the above goals may not be easy to achieve.

Course number	Title	Credit hours	Average number of sections per 2012/13 and 2013/14 academic years
MATH 1190	Topics in Mathematics (full year)	6	0.5
MATH 1690	Calculus (full year)	6	0
MATH 2202	Fundamentals of Mathematical Analysis	3	1
MATH 2300	Linear Algebra 2	3	2
MATH 2352	Advanced Linear Algebra (full year)	6	1
MATH 2400	Applied Graph Theory	3	2
MATH 2450	Combinatorial Mathematics (full year)	6	0
MATH 2500	Introduction to Number Theory	3	2
MATH 2552	Geometry of the Plane (full year)	6	0
MATH 2600	Numerical Mathematics 1	3	1
MATH 2730	Sequences and Series	3	2
MATH 2750	Intermediate Calculus (full year)	6	1
MATH 2800	Ordinary Differential Equations with Applications 1	3	1
MATH 3130	Linear Spaces for Physicists	3	1
MATH 3220	Set Theory	3	1
MATH 3230	Metric Spaces	3	1
MATH 3240	Topology 1	3	1
MATH 3300	Modern Algebra 1	3	1
MATH 3310	Modern Algebra 2	3	0
MATH 3350	Advanced Algebra (full year)	6	1
MATH 3400	Combinatorics 1	3	1
MATH 3430	Modern Geometry	3	0
MATH 3450	Theory of Numbers (full year)	6	0.5
MATH 3530	Mathematical Problems in the Biological Sciences	3	0.5
MATH 3600	Numerical Mathematics 2	3	1
MATH 3700	Applied Complex Analysis	3	1
MATH 3710	Complex Analysis 1	3	1
MATH 3740	Methods of Advanced Calculus (full year)	6	1
MATH 3760	Advanced Calculus (full year)	6	1
MATH 3800	Ordinary Differential Equations with Applications 2	3	1
MATH 3810	Partial Differential Equations 1	3	1
MATH 3820	Introduction to Mathematical Modelling	3	1
MATH 4200	Topology 2	3	0
MATH 4230	Algebraic Topology	3	1
MATH 4250	Mathematical Logic (full year)	6	0.5
MATH 4310	Applied Matrix Analysis	3	0.5
MATH 4350	Modern Algebra (full year)	6	0.5
MATH 4400	Combinatorics 2	3	0.5
MATH 4410	Graphs, Codes and Designs	3	0
MATH 4420	Finite Geometry	3	0
MATH 4430	Introduction to Elliptic Curves	3	0
MATH 4610	Introduction to Finite Elements and Boundary Elements	3	0
MATH 4700	Applied Functional Analysis	3	0
MATH 4710	Complex Analysis 2	3	1
MATH 4730	Tensor and Variational Calculus	3	0.5
MATH 4750	Real Variables (full year)	6	1
MATH 4800	Dynamical Systems: Theory and Applications	3	0.5

MATH 4810	Partial Differential Equations 2	3	1
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Tentative course offerings by term and year

Note that some courses will be offered every other year alternatively, every "or" listed below is exclusive, only one of the two listed courses will be offered per academic year. For example, if MATH 3480 is offered in Fall 2015, then MATH 3410 would be offered in Fall 2016. The exact schedule for such courses (such as odd fall/odd winter/even fall/even winter) will be indicated on the department's website so that students can plan ahead. Second year math electives are indicated (math honours and major students choose two out of these six courses). We do not indicate electives in the third and fourth years as they depend on the program. This table lists only new courses.

	Fall term	Winter term
Year 1	MATH 1230 MATH 1240	MATH 1220 MATH 1232
Year 2	MATH 2080 MATH 2090 MATH 2030 (elective) MATH 2040 (elective) MATH 2140 (elective) MATH 2160 (elective)	MATH 2020 MATH 2150 MATH 2180 MATH 2070 (elective) MATH 2170 (elective)
Year 3	MATH 3320 MATH 3330 MATH 3360 MATH 3380 MATH 3390 MATH 3440 MATH 3470 MATH 3480 or MATH 3410	MATH 3322 MATH 3340 MATH 3370 (or MATH 4300) MATH 3420 MATH 3460 MATH 3472
Year 4	MATH 4260 MATH 4290 MATH 4330 or MATH 4390 MATH 4370 MATH 4460 or MATH 4320 MATH 4470 or MATH 4240	MATH 4270 MATH 4280 MATH 4300 (or MATH 3370) MATH 4340 or MATH 4360 MATH 4380 (same year when MATH 4320 is offered) MATH 4440 MATH 4450

Transition Plan

Transition from Current to Revised Mathematics Curriculum

The Department of Mathematics is planning curriculum revision which will commence in September 2015. This first phase of the revision is focused on mathematics and joint mathematics programs. Most current 1000 level courses will remain to be taught and more advanced versions for mathematically inclined students will be offered. The structure of courses at the 2000, 3000, and 4000 levels will be quite different; however, the core material will remain the same. This document outlines the transition plan for affected students. There are currently 29 students in their second or third year in programs which are significantly affected (Mathematics Honours, Mathematics Four Year Major, Mathematics – Physics and Astronomy Joint Honours, Applied Mathematics with Economics/Computer Science/Statistics option, Mathematics – Computer Science Joint Honours, Statistics – Mathematics Joint Honours).

Currently students in these programs follow the program guide outlined in the university calendar but they have optional courses and electives in the upper years of the program which makes transition between programs less prescribed than might be found in the structured professional programs. Current and prospective students will receive notification about the revised curriculum as soon as possible following approval of the new curriculum. Students will be informed of how the Department plans to perform transition to the new curriculum. This notification will be made via class announcements during Winter 2015 and Summer 2015 terms, e-mails and notices on the Department of Mathematics website. In addition, there will be several information sessions for such students. The transition plan will also be discussed with the student advisors of the Faculty of Science.

There will be no gradual transition to new curriculum. Compared with the current curriculum, only 1000-level introductory courses (MATH 1300, MATH 1500, MATH 1700) and Engineering mathematics courses will be taught, while other mathematics courses will be deleted/discontinued and replaced with the new courses. MATH 2720 will remain to be taught, but enrollment will be restricted to students in Actuarial Mathematics programs only (more specifically, joint Statistics - Actuarial Mathematics honours program, Actuarial Mathematics program in the Faculty of Science and Actuarial Mathematics program in the School of Business). In other programs which require a multivariable calculus course, the new MATH 2150 will be used. General degree B.A. and B.Sc. students will have sufficient choice of courses on the second year level from the new curriculum without access to MATH 2720.

Students who require transition to the revised curriculum will meet with a faculty member from the Department of Mathematics to develop an individualized completion plan. The department plans to assign three faculty member to serve as such advisors during the transition period. Most common scenarios are outlined below, but some decisions will be made on a case by case basis. Due to a small number of students involved, this is a practical way of handling the transition.

In 2015/16 academic year, the new courses will be taught for the first time, and all students will come with the current courses as prerequisites. Instructors of the new courses will make special arrangements (handouts and online material, special lectures and/or tutorials) to cover the required minor differences in the background material. All faculty members of the Department of Mathematics have agreed to provide such special arrangements to facilitate transition to the new curriculum.

1. Bridging students who completed introductory 1000-level courses to the new mathematics programs

New mathematics programs will require four core courses at the first year level: MATH 1220, MATH 1230, MATH 1232, and MATH 1240. The following substitutions will be allowed, provided the corresponding grade requirement (as specified in the program chart) has been achieved:

New course	Allowed substitution
MATH 1220	MATH 1300
MATH 1230	MATH 1500 or MATH 1510
MATH 1232	MATH 1700 or MATH 1710

In some cases the grade required for substitution is higher than the current program requirement. Since students have not been notified of a change in requirement, the old requirement will be considered sufficient for students taking the introductory versions of the courses before 2015/16. For example, for a student taking MATH 1700 in Winter 2015, it would be sufficient to attain a mark of B to fulfill the requirement of MATH 1232 in Mathematics honours program. Starting with Fall 2015, a mark of A will need to be attained as per the proposed program chart.

Students who completed the introductory versions of the above courses will be referred to a web-based resource (which will be developed by July 1, 2015) covering difference of material between the more rigorous and the introductory versions of the course.

Students who have already completed MATH 1200 will not be required to complete MATH 1240, and will be referred to the above mentioned web-based resource. The prerequisite of MATH 1240 in MATH 2030, MATH 2070, and MATH 2080 will be waived for such students. MATH 1200 is planned not to be offered in 2015/16 academic year, and likely to be deleted in the future. The students who have not completed MATH 1200, will take MATH 1240.

2. Transition for students who are already in a mathematics program

Primary way to transition such students to the new programs will be the use of the following table. All courses below are 3 credit hour courses, except some current 6 credit hour courses indicated by "(6)". Completion of any revised program will require the same number of credit hours as in the corresponding current program. We anticipate that most transitioning students will be able to complete the new programs in the same amount of time as the corresponding current program, with exception of some course repetitions caused by low grades.

Certain combinations of courses from the current curriculum will replace certain combinations of courses from the new curriculum, as described in the comments column. In case there is no correspondence to the new curriculum, a student will receive a credit for the corresponding level mathematics course which will be considered towards mathematics elective requirements, i.e., the requirements of certain number of credit hours of mathematics at certain level when no specific course numbers are listed in the program chart. In a rare case if a student completely fulfills such elective requirement at certain level and has an extra unallocated credit, the extra credit can be considered towards specific required courses and will be evaluated by a

departmental student advisor.

Completed course in the current curriculum	Will satisfy the program requirement of the following course(s) in the new curriculum	Comments
MATH 2202	MATH 2080	New applied mathematics with option (computer science/economics/statistics) programs will require MATH 2080, while currently these programs do not require the corresponding MATH 2202. Currently there are five required 2 nd year courses in these programs: MATH 2300, MATH 2600, MATH 2720, MATH 2730, MATH 2800. If a student completed no more than three of these courses, they will be required to complete MATH 2080. Otherwise, it will be strongly recommended to complete MATH 2080, but an option will be given to replace MATH 2080 requirement with 3 credit hours of mathematics courses at 3000 or 4000 level.
MATH 2300	MATH 2090	
MATH 2352 (6)	MATH 2090 and 3 credit hours of 2 nd year mathematics	
MATH 2400	MATH 2070	
MATH 2450 (6)	MATH 2030 and 3 credit hours of 2 nd year mathematics	
MATH 2500	MATH 2170	
MATH 2552 (6)	6 credit hours of 2 nd year mathematics	
MATH 2600	MATH 2160	
MATH 2720	MATH 2150	If a mark of B or better has been achieved in MATH 2720*
MATH 2730	3 credit hours of 2 nd year mathematics	
MATH 2750	MATH 2150 and 3 credit hours of 2 nd year mathematics	

MATH 2800	3 credit hours of 2 nd year mathematics	A different and more advanced differential equations course will be taught on the third year level as MATH 3440
MATH 3220	MATH 3480	
MATH 3230	MATH 2180	
MATH 3240	MATH 3390	
MATH 3300	3 credit hours of 3 rd year mathematics	If both MATH 3300 and MATH 3310 have been completed with a mark of B or better, the requirements of MATH 2020 and MATH 3320 will be considered satisfied*
MATH 3310	3 credit hours of 3 rd year mathematics	If both MATH 3300 and MATH 3310 have been completed with a mark of B or better, the requirements of MATH 2020 and MATH 3320 will be considered satisfied*
MATH 3350 (6)	MATH 2020 and MATH 3320	
MATH 3400	MATH 2030 or 3 credit hours of 3 rd year mathematics	
MATH 3430	3 credit hours of 3 rd year mathematics	
MATH 3450 (6)	MATH 4450 and 3 credit hours of 3 rd year mathematics	
MATH 3530	MATH 4380	
MATH 3600	MATH 3420	
MATH 3700	MATH 3340	If a mark of B+ or better has been achieved in MATH 3700*
MATH 3710	MATH 3340	
MATH 3740 (6)	MATH 3470 and MATH 3472	If a mark of B+ or better has been achieved in MATH 3740*
MATH 3760 (6)	MATH 3470 and MATH 3472	
MATH 3800	MATH 3440	
MATH 3810	MATH 3460	
MATH 3820	MATH 2140	

MATH 4200	3 credit hours of 4 th year mathematics	
MATH 4230	MATH 4270	
MATH 4250 (6)	MATH 3410 and 3 credit hours of 4 th year mathematics	
MATH 4310	MATH 4370	
MATH 4350 (6)	6 credit hours of 4 th year mathematics	
MATH 4400	MATH 3360	
MATH 4410	3 credit hours of 4 th year mathematics	
MATH 4420	3 credit hours of 4 th year mathematics	
MATH 4430	3 credit hours of 4 th year mathematics	
MATH 4610	3 credit hours of 4 th year mathematics	
MATH 4700	3 credit hours of 4 th year mathematics	
MATH 4710	MATH 4290	
MATH 4730	MATH 4360	
MATH 4750 (6)	MATH 4260 and MATH 4280	
MATH 4800	MATH 4320	
MATH 4810	MATH 4460	
MATH 4920		Students who completed a topics course with material corresponding to a course in the new curriculum will receive credit for the corresponding new course.

*For all program substitutions requiring certain grade as described in the table, if a student has not achieved the required grade and has not completed any subsequent courses listing the course in question as a prerequisite, the student will need to repeat the course by taking the new version of the course. If a student has not achieved the required grade but has completed at least one

subsequent course listing the course in question as a prerequisite, the program substitution will be granted.

3. Transition for B.Sc. or B.A. general and Education programs

The requirements in these programs are not course specific and require certain number of mathematics courses at a certain level. Students will be able to take courses from new curriculum using already completed courses from current curriculum as prerequisites. New curriculum offers a greater variety of courses at the second year level, which will be particularly suitable for students in these programs. Students will be contacted by e-mail through their Faculties and will be referred to the corresponding section of the website of the department of mathematics describing their options in the new curriculum.

4. Transition for joint Statistics - Actuarial Mathematics Honours program, Actuarial Mathematics program in the Faculty of Science and Actuarial Mathematics program in the School of Business

In Year 1 of their programs the students will complete MATH 1220, MATH 1230, MATH 1232 or the allowed substitutions as per program description and the table in Section 1 of this document. Year 2 requirement will change from “MATH 2300, MATH 2720 and MATH 2730” to “MATH 1240 and MATH 2720”. Students beginning Year 2 in 2015/16 academic year, will complete the new requirement. Students in higher years will have the mathematics requirement completed by current curriculum; either of MATH 2300 or MATH 2730 can be considered as fulfilling the requirement of MATH 1240 in these programs. The programs do not require any mathematics courses in Years 3 and 4. There are approximately 150 students in these programs every year, they will be notified of the changes in program requirements by e-mail through their Faculty/School and through class announcements in MATH 2720, which will run exclusively for students in these programs in 2015/16.

5. Transition for Honours and Major Statistics programs

For Year 1 of these programs, transition can be performed as described in Section 1 of this document (“MATH 1200, MATH 1300, MATH 1500, MATH 1700” requirement will be changed to “MATH 1220, MATH 1230, MATH 1232, MATH 1240”). In Year 2, “MATH 2300, MATH 2720, MATH 2730” requirement will be changed to “MATH 2030, MATH 2080, MATH 2150” and in Years 3 and 4, “6 credit hours from MATH 2202, MATH 2600, MATH 2800, MATH 3230, MATH 3540, MATH 3600, MATH 3700, MATH 3740 (6), MATH 3800, MATH 3810” requirement will be changed to “6 credit hours from MATH 2140, MATH 2160, MATH 2180, MATH 3340, MATH 3440, MATH 3460, MATH 3470, MATH 3472”. For Years 2-4, transition can be performed following Section 2 of this document. There are 29 affected students, who will be notified by e-mail through the Department of Statistics.

6. Concluding remarks

This transition plan will address most of the current or prospective students in the affected programs. The structure of these programs often allows options and electives on various levels, including higher years. While all the efforts have been made to cover most situations, in some circumstances the department Head or the Dean may approve program completion by substituting courses or other means.

7. Sample completion plan

There are currently 6 students who are about to complete their 2nd year of Applied Mathematics with Economics option Program, which is the largest group of students in a specific year of a Mathematics program who will need to be transitioned to the new curriculum. (There are 5 students in their 2nd year and 1 student in his 3rd year of Mathematics honours program. There are 4 students in their 2nd year and 2 students in their 3rd year of Mathematics 4 year major program.) The table below contains a hypothetical completion plan for mathematics courses for such a student made following Sections 1 and 2 of this document, assuming the grades do not require course repetitions. The student would have yet to complete 30 credit hours of mathematics in the current program (3 credit hours from: MATH 2450 (6), MATH 2500, MATH 2552 (6), or any 3000 / 4000 level MATH course; and MATH 2400, MATH 3600, MATH 3700, MATH 3740 (6), MATH 3800, MATH 3810, MATH 3820, MATH 4310), and the completion plan also has 30 credit hours of mathematics courses to complete.

Completed courses from current program	Requirements in new program	Comments
MATH 1200	MATH 1240	fulfilled, prerequisite of MATH 1240 in MATH 2070 and MATH 2080 will be waived
MATH 1300	MATH 1220	fulfilled
MATH 1500	MATH 1230	fulfilled
MATH 1700	MATH 1232	fulfilled
MATH 2300	MATH 2090	fulfilled
MATH 2600	MATH 2160	fulfilled
MATH 2720	MATH 2150	fulfilled
MATH 2730	3 credit hours of “6 credit hours from: MATH 2030, MATH 2170, MATH 2040, or any 3000 / 4000 level MATH course”	fulfilled
MATH 2800	3 credit hours of “6 credit hours from: MATH 2030, MATH 2170, MATH 2040, or any 3000 / 4000 level MATH course”	fulfilled

Fall 2015		
	MATH 2080	strongly recommended to be completed, but can be replaced with 3 credit hours of mathematics courses at 3000 or 4000 level;
	MATH 2140	
	MATH 4370	can be taken in Fall 2016
Winter 2016		
	MATH 2070	
	MATH 2180	
	MATH 3420	can be taken in Winter 2017
Fall 2016		
	MATH 3440	
	MATH 3470	
Winter 2017		
	MATH 3340	
	MATH 3460	

Fulfilling teachable requirement with new mathematics curriculum

There are no specific mathematics courses currently required by the Faculty of Education. The strongest non-course-specific requirement (for Mathematics Major Senior Years after-degree B.Ed. program) is “30 credit hours of courses from the Departments of Mathematics and Statistics (with a minimum of 6 credit hours at the 2000-level or above)”. This note illustrates possible options for students to satisfy the above requirement using courses from the new mathematics curriculum. All proposed courses are 3 credit hour courses, which means a student needs to take **ten** courses, at least **two** at 2000-level or higher.

There are **four** 1st year mathematics courses which are core of the program and will need to be completed to obtain access to higher level courses: **MATH 1220** (or MATH 1300), **MATH 1230** (or MATH 1500), **MATH 1232** (or MATH 1700), **MATH 1240**.

The following **six** proposed 2nd year mathematics courses require only the above listed four mathematics courses as prerequisites and can likely be successfully completed by a typical general degree student with mathematics major: **MATH 2030, MATH 2040, MATH 2070, MATH 2090, MATH 2140, MATH 2160**. These courses cover various aspects of mathematics and such breadth would serve really well to a prospective mathematics teacher. On the other hand, students who are particularly interested in certain area of mathematics can easily choose to learn more in that area going through the corresponding sequence of courses. For example, with an interest in algebra, after completion of MATH 2090, one can take MATH 2020, and then have the choice of five more courses of algebraic flavour. 2nd year level courses in mathematical analysis include MATH 2080, MATH 2150, and MATH 2180, upon completion of which one can proceed to four more courses on the 3rd year level in this subject.

While the above listed (in bold font) **ten** mathematics courses can satisfy the teachable requirement, students can choose to complete several courses from the Department of Statistics instead, for instance: STAT 1000, STAT 2000, STAT 2400.

We also remark that in the current mathematics curriculum, the selection of 2nd year level mathematics courses for general degree students which use only 1st year courses as prerequisites is of the same size. Namely, there are six such courses currently offered: MATH 2300, MATH 2400, MATH 2500, MATH 2600, MATH 2720, MATH 2730.

In summary, the Department of Mathematics believes that implementation of new mathematics curriculum will not limit options of students who want to fulfil teachable requirement. We hope that in the long run the modernized and higher quality mathematics curriculum may help to improve secondary and high-school mathematics education in the province.

Mathematics

Deletions:

MATH 1190 Topics in Mathematics Cr.Hrs. 6	-6.0
MATH 2202 Fundamentals of Mathematical Analysis Cr.Hrs. 3	-3.0
MATH 2300 Linear Algebra 2 Cr.Hrs. 3	-3.0
MATH 2352 Advanced Linear Algebra Cr.Hrs. 6	-6.0
MATH 2400 Applied Graph Theory Cr.Hrs. 3	-3.0
MATH 2450 Combinatorial Mathematics Cr.Hrs. 6	-6.0
MATH 2500 Introduction to Number Theory Cr.Hrs. 3	-3.0
MATH 2552 Geometry of the Plane Cr.Hrs. 6	-6.0
MATH 2600 Numerical Mathematics 1 Cr.Hrs. 3	-3.0
MATH 2730 Sequences and Series Cr.Hrs. 3	-3.0
MATH 2750 Intermediate Calculus Cr.Hrs. 6	-6.0
MATH 2800 Ordinary Differential Equations with Applications 1 Cr.Hrs. 3	-3.0
MATH 3130 Linear Spaces for Physicists Cr.Hrs. 3	-3.0
MATH 3220 Set Theory Cr.Hrs. 3	-3.0
MATH 3230 Metric Spaces Cr.Hrs. 3	-3.0
MATH 3240 Topology 1 Cr.Hrs. 3	-3.0
MATH 3300 Modern Algebra 1 Cr.Hrs. 3	-3.0
MATH 3310 Modern Algebra 2 Cr.Hrs. 3	-3.0
MATH 3350 Advanced Algebra Cr.Hrs. 6	-6.0
MATH 3400 Combinatorics 1 Cr.Hrs. 3	-3.0
MATH 3430 Modern Geometry Cr.Hrs. 3	-3.0
MATH 3450 Theory of Numbers Cr.Hrs. 6	-6.0
MATH 3530 Mathematical Problems in the Biological Sciences Cr.Hrs. 3	-3.0
MATH 3600 Numerical Mathematics 2 Cr.Hrs. 3	-3.0
MATH 3700 Applied Complex Analysis Cr.Hrs. 3	-3.0
MATH 3710 Complex Analysis 1 Cr.Hrs. 3	-3.0
MATH 3740 Methods of Advanced Calculus Cr.Hrs. 6	-6.0
MATH 3760 Advanced Calculus Cr.Hrs. 6	-6.0
MATH 3800 Ordinary Differential Equations with Applications 2 Cr.Hrs. 3	-3.0
MATH 3810 Partial Differential Equations 1 Cr.Hrs. 3	-3.0
MATH 3820 Introduction to Mathematical Modelling Cr.Hrs. 3	-3.0
MATH 4200 Topology 2 Cr.Hrs. 3	-3.0
MATH 4230 Algebraic Topology Cr.Hrs. 3	-3.0
MATH 4250 Mathematical Logic Cr.Hrs. 6	-6.0
MATH 4310 Applied Matrix Analysis Cr.Hrs. 3	-3.0
MATH 4350 Modern Algebra Cr.Hrs. 6	-6.0
MATH 4400 Combinatorics 2 Cr.Hrs. 3	-3.0
MATH 4410 Graphs, Codes and Designs Cr.Hrs. 3	-3.0
MATH 4420 Finite Geometry Cr.Hrs. 3	-3.0
MATH 4430 Introduction to Elliptic Curves Cr.Hrs. 3	-3.0
MATH 4610 Introduction to Finite Elements and Boundary Elements Cr.Hrs. 3	-3.0
MATH 4700 Applied Functional Analysis Cr.Hrs. 3	-3.0
MATH 4710 Complex Analysis 2 Cr.Hrs. 3	-3.0
MATH 4730 Tensor and Variational Calculus Cr.Hrs. 3	-3.0
MATH 4750 Real Variables Cr.Hrs. 6	-6.0
MATH 4800 Dynamical Systems: Theory and Applications Cr.Hrs. 3	-3.0
MATH 4810 Partial Differential Equations 2 Cr.Hrs. 3	-3.0

Introductions:

MATH 1220 Linear Algebra 1 Cr.Hrs. 3 +3.0

(Laboratory required) The course is intended for students in mathematically rich disciplines including those planning to enter an Honours or Major program in Mathematics or Statistics. An introduction to vectors, matrices, systems of linear equations and three-dimensional geometry. Not to be held with MATH 1210, MATH 1211, MATH 1300, MATH 1301, MATH 1310, or the former MATH 1680. Prerequisite: Pre-calculus Mathematics 40S (70%) or the former Mathematics 40S (300) (70%), or the Mathematical Skills course taught by Extended Education (B). Applied Mathematics 40S (70%) may be used as a prerequisite to this course.

MATH 1230 Differential Calculus Cr.Hrs. 3 +3.0

(Laboratory required) The course is intended for students in mathematically rich disciplines including those planning to enter an Honours or Major program in Mathematics or Statistics. Rigorous treatment of limits, continuity, and differentiation (with epsilon-delta proofs), applications in optimization problems, related rates, l'Hopital's rule, curve sketching, Taylor polynomials. Not to be held with MATH 1500, MATH 1501, MATH 1510, MATH 1520, the former MATH 1680, or MATH 1690. Prerequisite: Pre-calculus Mathematics 40S (70%) or the former Mathematics 40S (300) (70%), or the Mathematical Skills course taught by Extended Education (B).

MATH 1232 Integral Calculus Cr.Hrs. 3 +3.0

(Laboratory required) The course is intended for students in mathematically rich disciplines including those planning to enter an Honours or Major program in Mathematics or Statistics. Integral calculus: theory and techniques of integration, curve sketching (parametric and polar), volume, arc length, surface area and partial derivatives. Sequences and series. Not to be held with MATH 1690, MATH 1700, MATH 1701, MATH 1710. Prerequisite: MATH 1230 (C) or MATH 1500 (B) or MATH 1501 (B) or MATH 1510 (B).

MATH 1240 Elementary Discrete Mathematics Cr.Hrs. 3 +3.0

(Laboratory required) The course is intended for students in mathematically rich disciplines including those planning to enter an Honours or Major program in Mathematics or Statistics. An introduction to Discrete Mathematics. Topics include mathematical induction, modular arithmetic, Boolean algebras, basic sentential logic, elementary set theory and functional notation, partial orders, basic graph theory, basic counting. Not to be held with MATH 3120. Prerequisite: Pre-calculus Mathematics 40S (60%) or the former Mathematics 40S (300) (60%), or the Mathematical Skills course taught by Extended Education (C).

MATH 2020 Algebra 1 Cr.Hrs. 3 +3.0

(Laboratory required) Groups, Rings, Fields: Elementary Concepts and Examples. Not to be held with the former MATH 3350. Prerequisite: MATH 2090 (C) or the former MATH 2352 (C) or the former MATH 2300 (B) or MATH 2301 (B).

MATH 2030 Combinatorics 1 Cr.Hrs. 3 +3.0

(Laboratory required) Introductory combinatorics, including basic counting, permutations and combinations, enumeration, inclusion-exclusion, pigeonhole principle, solving basic recursions, relations, and derangements. Not to be held with the former MATH 3400. Prerequisites: MATH 1240 (C) or [the former MATH 2202 (C) and the former MATH 2352 (C)] or consent of instructor.

- MATH 2040 Curves and Surfaces Cr.Hrs. 3 +3.0
(Laboratory required) Curves and surfaces in the plane and space. Intrinsic geometry of curves and surfaces: Serret Frenet frames, first and second fundamental forms, curvature and the Gauss map. Geodesics and parallel transport. Theorema Egregium and Gauss-Bonnet theorems. Prerequisites: [MATH 1232 (C) or MATH 1690 (C) or MATH 1700 (B) or MATH 1701 (B) or MATH 1710 (B)] and [MATH 1220 (C) or MATH 1300 (B) or MATH 1301 (B)], or consent of instructor.
- MATH 2070 Graph Theory 1 Cr.Hrs. 3 +3.0
(Laboratory required) Introduction to graphs, digraphs, and multigraphs. Topics include trees, cycles and circuits, planarity, basic graph algorithms, and applications of graph theory to social and physical sciences. Not to be held with the former MATH 2400 or COMP 4340. Prerequisites: MATH 1240 (C) and [MATH 1220 (C) or MATH 1300 (B) or MATH 1301 (B)].
- MATH 2080 Introduction to Analysis Cr.Hrs. 3 +3.0
(Laboratory required) Fundamental properties of the real number system as a complete ordered field, Archimedean property, existence of square roots, density of rational numbers, uncountability of real numbers. Sequences, subsequences, limit theorems, monotonicity, Bolzano-Weierstrass theorem, Cauchy sequences. Rigorous treatment of limits and continuity of functions of one and several variables. Uniform continuity. Applications. Not to be held with the former MATH 2202. Prerequisites: [MATH 1232 (C) or MATH 1690 (C) or MATH 1700 (B) or MATH 1701 (B) or MATH 1710 (B)] and [MATH 1220 (C) or MATH 1300 (B) or MATH 1301 (B)] and MATH 1240 (C).
- MATH 2090 Linear Algebra 2 Cr.Hrs. 3 +3.0
(Laboratory required) The course is intended for students in mathematically rich disciplines. Abstract vector spaces, linear transformations, bases and coordinatization, matrix representations, orthogonalization, diagonalization, principal axis theorem. Not to be held with the former MATH 2300, MATH 2301, or the former MATH 2352. Prerequisite: MATH 1220 (C) or MATH 1300 (B) or MATH 1301 (B).
- MATH 2140 Modelling Cr.Hrs. 3 +3.0
(Laboratory required) Introductory course on the design and analysis of mathematical models for real-life phenomena arising in the natural, engineering and social sciences. Not to be held with the former MATH 3820 or MATH 3821. Prerequisite: MATH 1230 (C+) or MATH 1690 (C+) or MATH 1500 (B) or MATH 1501 (B) or MATH 1510 (B) or MATH 1220 (C) or MATH 1300 (B) or MATH 1301 (B).
- MATH 2150 Multivariable Calculus Cr.Hrs. 3 +3.0
(Laboratory required) The course is intended for students in mathematically rich disciplines. Parametric curves, arc length and curvature. Functions of several variables. Level curves. Partial derivatives, gradient, divergence and curl. Max/min problems. Double and triple integrals, line and surface integrals of functions and vector fields, and applications. Green's, Stokes, and divergence theorems. Not to be held with MATH 2130, MATH 2720, MATH 2721, or the former MATH 2750. Prerequisite: MATH 2080 (C) or the former MATH 2202 (C).
- MATH 2160 Numerical Analysis 1 Cr.Hrs. 3 +3.0
(Laboratory required) Elementary techniques of numerical solution of mathematical problems: solution of equations, linear systems of equations, nonlinear equations; finite and divided differences, interpolation; numerical differentiation and integration. Not to be held with MATH 2120, the former MATH 2600, or MATH 2601. Prerequisites: [MATH 1232 (C) or MATH 1690

(C) or MATH 1700 (B) or MATH 1701 (B) or MATH 1710 (B)] and [MATH 1220 (C) or MATH 1300 (B) or MATH 1301 (B)].

MATH 2170 Number Theory 1 Cr.Hrs. 3 +3.0
(Laboratory required) Prime numbers, unique factorization, linear congruences, Chinese remainder theorem, multiplicative functions, primitive roots and quadratic reciprocity. Not to be held with the former MATH 2500 or MATH 2501. Pre- or corequisite: MATH 2020 or [(the former MATH 2352 (C) or the former MATH 2300 (B) or MATH 2301 (B)) and consent of instructor].

MATH 2180 Real Analysis 1 Cr.Hrs. 3 +3.0
(Laboratory required) Introduction to metric spaces including connectedness, compactness and continuity; topics in infinite series of numbers, and sequences and series of functions. Not to be held with the former MATH 3230. Prerequisite: MATH 2080 (C) or the former MATH 2202 (C).

MATH 3320 Algebra 2 Cr.Hrs. 3 +3.0
Basic structure theory of groups, Integral domains and field extensions. Not to be held with the former MATH 3350. Prerequisite: MATH 2020 (C) or [(the former MATH 2352 (C) or the former MATH 2300 (B) or MATH 2301 (B)) and consent of instructor].

MATH 3322 Algebra 3 Cr.Hrs. 3 +3.0
A continuation of topics in Algebra 1 and Algebra 2. More structure theory of groups, general ring theory, fields and field extensions, Galois theory. Prerequisite: MATH 3320 (C) or [the former MATH 3350 (C) and consent of instructor].

MATH 3330 Computational Algebra Cr.Hrs. 3 +3.0
An introduction to the use of computers for symbolic mathematical computation, involving solving nonlinear systems and differential equations. A suitable software package will be used to explore applications. Prerequisite: MATH 2090 (C) or the former MATH 3300 (C) or the former MATH 3350 (C) or consent of instructor.

MATH 3340 Complex Analysis 1 Cr.Hrs. 3 +3.0
Analytic functions, Cauchy's theorem and integral formula, series representation of analytic functions, calculus of residues, Rouché's theorem and the principle of the argument. Not to be held with the former MATH 3710. Prerequisites: [MATH 2180 (C) or the former MATH 3230 (C)] and [MATH 2150 (C) or MATH 2720 (B) or MATH 2721 (B) or the former MATH 2750 (C)].

MATH 3360 Combinatorics 2 Cr.Hrs. 3 +3.0
Advanced topics in combinatorics, including generating functions, elementary design theory, recurrences, chains and antichains, Polya counting. The course is intended for students in mathematically rich disciplines. Not to be held with the former MATH 4400. Prerequisite: MATH 2030 (C) or the former MATH 3400 (C).

MATH 3370 Graph Theory 2 Cr.Hrs. 3 +3.0
Advanced topics in graph theory, including matchings and coverings, optimization, factors, flows, extremal graph theory, basic Ramsey theory, connectivity, and spectral graph theory. Selected applications in science and operations research are studied. The course is intended for students in mathematically rich disciplines. Not to be held with COMP 4340. Prerequisite: MATH 2070 (C) or the former MATH 2400 (B) or permission of instructor.

- MATH 3380 Introduction to Projective Planes Cr.Hrs. 3 +3.0
Affine planes and projective planes, cross ratio, complex projective plane (the great unifier), Desargues' theorem, projective planes over division rings, Pappus' theorem and commutativity, the fundamental theorem for projectivities on a line, introduction of coordinates in a projective plane. Not to be held with the former MATH 2552 or the former MATH 3430. Prerequisite: MATH 2020 (C) or the former MATH 3300 (C) or the former MATH 3350 (C) or consent of instructor.
- MATH 3390 Introduction to Topology Cr.Hrs. 3 +3.0
Topological spaces, continuity, connectedness, compactness, separation properties. Not to be held with the former MATH 3240. Prerequisite: MATH 2180 (C) or the former MATH 3230 (C) or consent of instructor.
- MATH 3410 Introduction to Mathematical Logic Cr.Hrs. 3 +3.0
Propositional and first-order logic. Recursion theory. Not to be held with the former MATH 4250. Prerequisite: MATH 2020 (C) or the former MATH 2202 (C) or the former MATH 2352 (C) or consent of instructor.
- MATH 3420 Numerical Analysis 2 Cr.Hrs. 3 +3.0
Numerical methods for eigenvalue problems, nonlinear systems, initial-value problems, boundary-value problems; finite difference methods for ordinary and partial differential equations; error analysis. Not to be held with the former MATH 3600 or MATH 3601. Prerequisites: [MATH 2090 (C) or the former MATH 2300 (B) or MATH 2301 (B) or the former MATH 2352 (C)] and [MATH 2150 (C) or MATH 2720 (B) or MATH 2721 (B) or the former MATH 2750 (C)] and [MATH 2160 (C) or the former MATH 2600 (C) or MATH 2601 (C)]. Pre- or corequisite: MATH 3440 or the former MATH 2800 or MATH 2801.
- MATH 3440 Ordinary Differential Equations Cr.Hrs. 3 +3.0
Theory and applications of ordinary differential equations; existence and uniqueness of solutions, linear systems, simple nonlinear systems. This course is theory-based and is intended for students in mathematically rich disciplines. Not to be held with the former MATH 3800. Prerequisite: MATH 2180 (C) or [(MATH 1300 (B) or MATH 1301 (B)) and (the former MATH 2730 (8) or MATH 2731 (B) or the former MATH 2750 (C))].
- MATH 3460 Partial Differential Equations Cr.Hrs. 3 +3.0
Method of characteristics for first order PDEs, wave, beam, heat and Laplace equations, derivation of PDEs, existence and uniqueness, energy estimates, well-posedness, maximum principles, separation of variables. Not to be held with the former MATH 3810. Prerequisites: [MATH 2150 (C) or the former MATH 2750 (C) or ((MATH 2720 (B) or MATH 2721 (B)) and (the former MATH 2730 (B) or MATH 2731 (B)))] and [MATH 3440 (C) or the former MATH 3800 (C)].
- MATH 3470 Real Analysis 2 Cr.Hrs. 3 +3.0
Functions of bounded variation, Riemann-Stieltjes integration and Lebesgue integration. Not to be held with the former MATH 3740 or the former MATH 3760. Prerequisites: [MATH 2150 (C) or MATH 2720 (B) or MATH 2721 (B) or the former MATH 2750 (C)] and [MATH 2180 (C) or the former MATH 3230 (C)].
- MATH 3472 Real Analysis 3 Cr.Hrs. 3 +3.0
Fourier series and Fourier transforms; orthogonal systems and L^2 theory, convergence and approximation. Multivariable calculus of maps from R^n to R^m , general chain rule and general

notion of derivative, implicit function and inverse function theorems. Not to be held with the former MATH 3740 or the former MATH 3760. Prerequisite: MATH 3470 (C).

MATH 3480 Set Theory Cr.Hrs. 3 +3.0

Axiomatic set theory. Cardinality, well-ordered sets, ordinal numbers, cardinal numbers. Axiom of Choice. Ordinal and cardinal arithmetic. Transfinite induction and recursion. Not to be held with the former MATH 3220. Prerequisite: MATH 2020 (C) or the former MATH 2202 (C) or consent of instructor.

MATH 4240 Advanced Group Theory Cr.Hrs. 3 +3.0

Representation theory of finite groups, presentations of finite and infinite groups, or other topics. Prerequisite: MATH 3322 (C) or the former MATH 3350 (C) or consent of Instructor.

MATH 4260 Abstract Measure Theory Cr.Hrs. 3 +3.0

Lebesgue and abstract measures, measurable functions, convergence theorems, absolutely continuous functions, measure spaces, the Radon-Nikodym theorem, Fubini's and Tonelli's theorems. Not to be held with the former MATH 4750. Prerequisite: MATH 3472 (C) or the former MATH 3740 (B+) or the former MATH 3760 (C).

MATH 4270 Algebraic Topology Cr.Hrs. 3 +3.0

This course will serve as an introduction to elements of homotopy or homology theory. Not to be held with the former MATH 4230. Prerequisites: [MATH 3322 (C) or the former MATH 3300 (C)] and [MATH 3390 (C) or the former MATH 3240 (C)], or consent of instructor.

MATH 4280 Basic Functional Analysis Cr.Hrs. 3 +3.0

Banach spaces, Hahn-Banach, open mapping and closed graph theorems, principle of uniform boundedness, linear operators and functionals, dual space, L_p and L_q spaces, weak and weak* topologies, Hilbert spaces and compact operators on a Hilbert space. Not to be held with the former MATH 4750. Prerequisites: [MATH 3472 (C) or the former MATH 3740 (B+) or the former MATH 3760 (C)] and [MATH 3390 (C) or the former MATH 3240 (C)], or consent of instructor.

MATH 4290 Complex Analysis 2 Cr.Hrs. 3 +3.0

Conformal mappings, normal families, harmonic and subharmonic functions, Perren's family, Dirichlet problem and Green's function. Not to be held with the former MATH 4710. Prerequisites: [MATH 3340 (C) or the former MATH 3700 (B+) or the former MATH 3710 (C)] and [MATH 3390 (C) or the former MATH 3240 (C)].

MATH 4300 Combinatorial Geometry Cr.Hrs. 3 +3.0

Topics in combinatorial geometry, including arrangements of convex bodies, introduction to polytopes, problems in discrete geometry, repeated distances, and geometric graphs. Prerequisite: MATH 3360 (C) or the former MATH 3400 (C) or consent of instructor.

MATH 4320 Dynamical Systems Cr.Hrs. 3 +3.0

Techniques for the qualitative analysis of nonlinear systems of ordinary differential equations and discrete-time systems. Not to be held with the former MATH 4800. Prerequisite: MATH 3440 (C) or the former MATH 3800 (C).

MATH 4330 Fundamentals of Approximation Theory Cr.Hrs. 3 +3.0

Theoretical aspects of approximation theory: density, existence, uniqueness; direct and inverse theorems for polynomial approximation. Prerequisites: [MATH 2080 (C) or the former MATH

2202 (C)] and [MATH 2160 (C) or the former MATH 2600 (C) or MATH 2601 (C)], or consent of instructor.

MATH 4340 Introduction to Algebraic Geometry Cr.Hrs. 3 +3.0

This course will introduce students to the basics of affine and projective varieties through a combination of basic theoretical tools and elementary examples. Prerequisite: MATH 3322 (C) or the former MATH 3350 (C) or consent of instructor.

MATH 4360 Introduction to Differential Geometry Cr.Hrs. 3 +3.0

Manifolds and submanifolds; vector and tensor fields, Lie brackets and derivatives. Also at least one of the following: exterior differential calculus and Stokes' theorem, introduction to Riemannian geometry, symplectic geometry and hamiltonian mechanics. Not to be held with the former MATH 4730. Prerequisites: [MATH 3472 (C) or the former MATH 3740 (B) or the former MATH 3760 (C)] and [MATH 3390 (C) or the former MATH 3240 (C)].

MATH 4370 Linear Algebra and Matrix Analysis Cr.Hrs. 3 +3.0

Vector and matrix norms, matrix factorizations, eigenvalues and eigenvectors, theory of non-negative matrices. Applications to differential equations, math biology, numerical analysis, digital image processing, data mining, GPS, Markov chains, graph theory, etc. will be given in this course. Not to be held with the former MATH 4310. Prerequisite: MATH 2090 (C) or the former MATH 2300 (B) or MATH 2301 (B) or the former MATH 2352 (C).

MATH 4380 Mathematical Biology Cr.Hrs. 3 +3.0

Formulation, analysis and simulation of suitable models in mathematical biology. Applications will be chosen from fields such as population dynamics, epidemiology, ecology, immunology and cellular dynamics. Not to be held with the former MATH 3530. Prerequisite: MATH 4320 (C) or the former MATH 3800 (C) or consent of instructor.

MATH 4390 Numerical Approximation Theory Cr.Hrs. 3 +3.0

Computational aspects of approximation by interpolatory polynomials, convolutions, artificial neural networks, splines and wavelets. Prerequisites: [MATH 2150 (C) or MATH 2720 (B) or MATH 2721 (B) or the former MATH 2750 (C)] and [MATH 2160 (C) or the former MATH 2600 (C) or MATH 2601 (C)], or consent of instructor.

MATH 4440 Numerical Analysis of Partial Differential Equations Cr.Hrs. 3 +3.0

Finite difference method, mathematical theory of Elliptic PDEs, finite element method, iterative solution of linear systems, spectral methods. Emphasis will be on the error analysis (stability, consistency and convergence) of the various methods. Prerequisites: [MATH 3420 (C) or the former MATH 3600 (C) or MATH 3601 (C)] and [MATH 3460 (C) or the former MATH 3810 (C)] and [MATH 3470 (C) or the former MATH 3740 (B) or the former MATH 3760 (C)], or consent of instructor. It is recommended that MATH 4370 be taken prior to or at the same time.

MATH 4450 Number Theory 2 Cr.Hrs. 3 +3.0

Algebraic number theory, arithmetic geometry and analytic number theory, Diophantine equations, examples such as arithmetic of elliptic curves and Dirichlet L -functions. Not to be held with the former MATH 3450. Prerequisites: [MATH 2020 (C) and MATH 2170 (C)] or [(the former MATH 2500 (C) or MATH 2501 (C)) and the former MATH 2202 (C) and the former MATH 2750 (C)], or consent of instructor.

MATH 4460 Partial Differential Equations 2 Cr.Hrs. 3 +3.0
Green's function, Poisson, heat, Schrodinger and wave equations in two and three spatial dimensions, variational characterization of eigenvalues, Fourier and Laplace transforms, introduction to functional analytic techniques in PDEs. Not to be held with the former MATH 4810. Prerequisites: [MATH 3460 (C) or the former MATH 3810] and [MATH 3470 (C) or the former MATH 3740 (B) or the former MATH 3760 (C)], or consent of instructor.

MATH 4470 Rings and Modules Cr.Hrs. 3 +3.0
The general theory of (non-commutative) rings, modules and algebras. Prerequisite: MATH 3322 (C) or the former MATH 3350 or consent of instructor.

Modifications:

MATH 1210 Techniques of Classical and Linear Algebra Cr.Hrs. 3 0.0
(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 (136.120), MATH 1201, MATH 1211, MATH 1220, MATH 1300 (136.130), MATH 1301, or MATH 1310 (136.131). Prerequisites: a minimum grade of 60% in Pre-calculus Mathematics 40S or the former Mathematics 40S (300), or a grade of "C" or better in the Mathematical Skills course taught by Extended Education.

MATH 1300 Vector Geometry and Linear Algebra Cr.Hrs. 3 0.0
(Lab required) An introduction to vectors, matrices, systems of linear equations and three-dimensional geometry. Not to be held for credit with MATH 1210, MATH 1211, MATH 1220, MATH 1310 (136.131), MATH 1301, or the former MATH 1680 (136.168). Prerequisite: a minimum grade of 60% in Pre-calculus Mathematics 40S or the former Mathematics 40S (300), or a grade of "C" 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 0.0
(Lab required) 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 1211, MATH 1220, MATH 1300 (136.130), MATH 1301, or the former MATH 1680 (136.168). Prerequisite: a minimum grade of 60 % in Pre-calculus Mathematics 40S or the former Mathematics 40S (300), or a grade of "C" 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 0.0
(Lab required) Differentiation and integration of elementary functions, with applications to maxima and minima, rates of change, area, and volume. Not to be held with MATH 1230, MATH 1501, MATH 1510 (136.151), MATH 1520 (136.152), the former 136.153, the former MATH 1680 (136.168), or MATH 1690 (136.169). Prerequisite: a minimum grade of 60% in Pre-calculus Mathematics 40S or the former Mathematics 40S (300), or a grade of "C" or better in the Mathematical Skills course taught by Extended Education.

- MATH 1510 Applied Calculus 1 Cr.Hrs. 3 0.0
(Lab required) 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 1230, MATH 1500, MATH 1501 (136.150), MATH 1520 (136.152), the former 136.153, the former MATH 1680 (136.168), or MATH 1690 (136.169). Prerequisite: a minimum grade of 60% in Pre-calculus Mathematics 40S or the former Mathematics 40S (300), or a grade of "C" or better in the Mathematical Skills course taught by Extended Education; and Physics 40S (300) or a "P" in PHYS 0900 (016.090).
- MATH 1520 Introductory Calculus for Management and Social Sciences Cr.Hrs. 3 0.0
(Lab required) Differentiation and integration of functions of one variable and partial differentiation of functions of several variables. Emphasizes applications in the areas of management and social science. Not to be held with MATH 1230, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), the former 136.153, the former MATH 1680 (136.168), or MATH 1690 (136.169). Prerequisite: a minimum grade of 60% in Pre-calculus Mathematics 40S or the former Mathematics 40S (300), or a minimum grade of "C" in the Mathematical Skills course taught by Extended Education.
- MATH 1690 Calculus Cr.Hrs. 6 0.0
(Lab required) An introduction to the calculus of functions of one variable. This course covers the same material as MATH 1500 (136.150) and MATH 1700 (136.170) together, but in greater depth. Exposure to high school calculus (45S) is desirable, but not essential. This course is intended for students planning to enter an Honours or 4-year Major program in Mathematics. Not to be held with MATH 1230, MATH 1232, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), MATH 1520 (136.152), the former 136.153, the former MATH 1680 (136.168), MATH 1700, MATH 1701 (136.170), MATH 1710 (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 0.0
(Lab required) Theory and techniques of integration, curve sketching, volume, arc length, surface area and partial derivatives. Not to be held with MATH 1232, MATH 1690 (136.169), MATH 1701, MATH 1710 (136.171), or the former 136.173. Prerequisite: A grade of "C" or better in one of MATH 1230, MATH 1500, MATH 1501 (136.150), MATH 1510 (136.151), MATH 1520 (136.152), the former 136.153, or the former MATH 1680 (136.168).
- MATH 1710 Applied Calculus 2 Cr.Hrs. 3 0.0
(Lab required) Applications of integration to volumes, centres of mass, moments of inertia, 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 1232, MATH 1690 (136.169), MATH 1700 (136.170), MATH 1701, or the former 136.173. Prerequisite: A grade of "C" or better in one of MATH 1230, MATH 1500 (136.150), MATH 1501, MATH 1510 (136.151), MATH 1520 (136.152), the former 136.153, or the former MATH 1680 (136.168). Prerequisite or corequisite: PHYS 1050 or PHYS 1051.
- MATH 2720 Multivariable Calculus Cr.Hrs. 3 0.0
Calculus of several variables. For students in Actuarial Mathematics programs only. Not to be held with MATH 2721 (136.272, 136.270), the former MATH 2750 (136.275), the former MATH 2110 (136.211), MATH 2130, or MATH 2150. Prerequisites: A grade of "C" or better in one of

MATH 1220, MATH 1300 (136.130), MATH 1301, or MATH 1310 (136.131) (C); and a grade of "C" or better in one of MATH 1232, MATH 1690, (136.169), MATH 1700 (136.170), MATH 1701, MATH 1710 (136.171), or the former 136.173.

NET CHANGE IN CREDIT HOURS: -36.0

Program modifications:

The department is proposing major program modifications encompassing all of its programs, as detailed on the following pages.

**MATHEMATICS
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General remarks to be included in the Department of Mathematics' introductory section of the calendar:

The following courses may not be offered every year, but are usually offered once every second year: MATH 3370, MATH 3410, MATH 3480, MATH 4240, MATH 4300, MATH 4320, MATH 4330, MATH 4340, MATH 4360, MATH 4380, MATH 4390, MATH 4460, and MATH 4470. Please refer to Aurora Student for courses offered in the current year and to the website of the Department of Mathematics for the planned schedule of future course offerings.

All courses (unless otherwise specified) may be taken in a different year than indicated. Each program chart indicates one possible arrangement of courses and is meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses.

The website of the Department of Mathematics has specific suggestions regarding selection of mathematics electives depending on student's interests and future plans. In particular, certain courses are recommended for students interested in pursuing a graduate degree in mathematics.

Mathematics courses that are not currently offered or credit transfers from other institutions may be accepted for credit in any program of the Department of Mathematics, if specifically approved by the Department. Note that old non-honours courses or credit transfers of particularly applied mathematics courses will normally not be accepted in honours programs. Students can contact an advisor in the Department to assess their specific situation.

Program modification:

Modifications to the **Bachelor of Science (Honours) in Mathematics** are outlined on the next pages.

**MATHEMATICS
PROGRAM MODIFICATIONS
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Proposed Changes to the B.Sc. Honours Degree in Mathematics

Current Mathematics Honours Program Requirements:

To enter the Honours program in Mathematics, a student must have completed at least 24 credit hours with a minimum GPA of 3.00, and also obtained a minimum grade of "B" in the following courses: MATH 1300; and one of MATH 1700 or MATH 1690 (or equivalent).

To continue in the Mathematics Honours program, students must maintain a minimum GPA of 3.00, and complete a minimum of 9 credit hours during each Fall and Winter Term.

To graduate with the B. Sc. Honours degree, a student must maintain a minimum 3.00 GPA and achieve a minimum grade of "C" on all courses that make up the 120 credit hours of the degree.

The program for students who elect Honours in Mathematics is as follows:

Year 2 Mathematics courses as indicated in the chart below and nine (9) credit hours from such fields as physics, chemistry, actuarial mathematics, computer science, statistics, philosophy, or economics. Other fields may be elected with the approval of the department.

Year 3 Mathematics courses as indicated in the chart below and electives to be chosen from the subject fields below or a third or fourth year Mathematics course not already elected. Students performing satisfactorily in Year 2 may obtain permission to take an additional course.

Year 4 Mathematics courses as indicated in the chart below and electives to be chosen from the subject fields below or a third or fourth year Mathematics course not already elected. Students performing satisfactorily in Year 3 may obtain permission to take an additional course.

Electives normally allowed are:

Statistics: STAT 2000, STAT 2400, STAT 3470, STAT 3480, STAT 3400 (STAT 3500), STAT 3800 (STAT 3600), STAT 4100 (STAT 4140), STAT 4520, STAT 4530, STAT 4580, STAT 4590, STAT 4600, STAT 4620, STAT 4630, STAT 4690.

Physics: PHYS 2380, PHYS 2600, PHYS 2610, PHYS 2650, PHYS 3670, PHYS 3680, PHYS 3650, PHYS 3660, PHYS 3630, PHYS 3640, PHYS 3380, PHYS 4390, PHYS 4620, PHYS 4640, PHYS 4650.

Chemistry: CHEM 2280, CHEM 2290, CHEM 3360, CHEM 3370, CHEM 4640, CHEM 4650.

Economics: ECON 2530, ECON 2700, ECON 3700, ECON 3730, ECON 4120, ECON 4130.

Mechanical Engineering: MECH 3490.

Other courses may be chosen with permission of the department. Students are required to obtain the approval of the department concerning their choice of electives.

Proposed Mathematics Honours program requirements:

To enter the Honours program in Mathematics, a student must have completed at least 24 credit hours with a minimum GPA of 3.00, and also obtained a minimum grade of "B" in either MATH 1232 or MATH 1690, or a minimum grade of "A" in MATH 1700.

To continue in the Mathematics Honours program, students must maintain a minimum GPA of 3.00, and complete a minimum of 9 credit hours during each Fall and Winter Term.

To graduate with the B. Sc. Honours degree, a student must maintain a minimum 3.00 GPA and achieve a minimum grade of "C" in all courses that make up the 120 credit hours of the degree.

List of Year 2 Mathematics electives (of which two are required for the core requirements): MATH 2030, MATH 2040, MATH 2070, MATH 2140, MATH 2160, MATH 2170.

Other electives normally allowed are:

Statistics: STAT 2000, STAT 2400, STAT 3470, STAT 3480, STAT 3400 (STAT 3500), STAT 3800 (STAT 3600), STAT 4100 (STAT 4140), STAT 4520, STAT 4530, STAT 4580, STAT 4590, STAT 4600, STAT 4620, STAT 4630, STAT 4690.

Physics: PHYS 2380, PHYS 2600, PHYS 2610, PHYS 2650, PHYS 3670, PHYS 3680, PHYS 3650, PHYS 3660, PHYS 3630, PHYS 3640, PHYS 3380, PHYS 4390, PHYS 4620, PHYS 4640, PHYS 4650.

Chemistry: CHEM 2280, CHEM 2290, CHEM 3360, CHEM 3370, CHEM 4640, CHEM 4650.

Economics: ECON 2010, ECON 2030, ECON 3010, ECON 3030, ECON 4040, ECON 4042.

Mechanical Engineering: MECH 3490.

Other courses may be chosen with permission of the department. Students are required to obtain the approval of the department concerning their choice of electives.

Current Mathematics Honours Program Chart:

4.9.2 Mathematics			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
⁴ MATHEMATICS HONOURS 120 CREDIT HOURS			
¹ MATH 1300 (B) MATH 1690 (6) (B) (or MATH ¹ 1500 and MATH 1700 (B))	MATH 2202, MATH 2352 (6), MATH 2600, MATH 2750 (6), MATH 2800	⁴ 48 credit hours³ of 3000 and 4000 level Mathematics courses, which must include the following: MATH 3230, MATH 3400, MATH 3760 (6), MATH 3800; and one of the two concentrations listed below: Applied and Computational Mathematics Concentration: MATH 3300 or MATH 3350 (6); MATH 3700 or MATH 3710; and at least 12 credit hours from the former 136.351, MATH 3600, MATH 3810, MATH 3820, MATH 4310, MATH 4610, MATH 4800 or MATH 4810 Pure Mathematics Concentration: MATH 3350 (6), MATH 3710 and at least 12 credit hours from MATH 3240, MATH 4200, MATH 4350 (6), MATH 4410 or MATH 4420, MATH 4710, MATH 4750 (6)	
The following can be completed in Year 1 or Year 2: ² STAT 1000 , ² COMP 1010 6 credit hours from the Faculty of Arts, which should include the required "W" course		18 credit hours of approved electives (review above list for acceptable electives)	
30 credit hours		30 credit hours	

NOTES:

1 MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300; MATH 1710 may be taken in place of MATH 1700. MATH 1690 may be taken in place of both MATH 1500 and 1700).

2 STAT 1000 and COMP 1010 must be completed by the end of Year 2.

3 Students considering graduate work in pure mathematics should note that many graduate schools may require a student to rectify any deficiencies in MATH 4200, MATH 4210, MATH 4350, MATH 4710, MATH 4720 and MATH 4750.

4 MATH 3200, MATH 3210, MATH 3740 and MATH 3910 cannot be used in an Honours program.

5 IMPORTANT: The four year Major programs need not be completed in the manner prescribed in the charts above. Each chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. Please refer to the text above for the minimum requirements for entry to a four year Major.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Mathematics Honours Program Chart:

4.9.2 Mathematics			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
MATHEMATICS HONOURS 120 CREDIT HOURS			
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240	MATH 2020, MATH 2080, MATH 2090, MATH 2150, MATH 2180 6 credit hours from the following list: MATH 2030, MATH 2040, MATH 2070, MATH 2140, MATH 2160 ² , MATH 2170	36 credit hours of Mathematics courses, which must include the following: MATH 3320, MATH 3340, MATH 3390, MATH 3440, MATH 3470, MATH 3472; and one of the two concentrations listed below: Applied and Computational Mathematics Concentration: MATH 3420, MATH 3460, MATH 4370; and additional 9 credit hours to be chosen from: MATH 3322, MATH 3330, MATH 4280, MATH 4320 ³ , MATH 4330 ³ , MATH 4380 ³ , MATH 4390 ³ , MATH 4440, MATH 4460 ³ Pure Mathematics Concentration: MATH 3322, one of (MATH 3410 ³ or MATH 3480 ³), MATH 4260, and one of (MATH 4300 ³ or MATH 4340 ³ or MATH 4360 ³); and additional 6 credit hours to be chosen from: MATH 3360, MATH 4240 ³ , MATH 4270, MATH 4280, MATH 4290, MATH 4450, MATH 4470 ³ .	
STAT 1000, COMP 1010			
The following must be completed in Year 1 or Year 2: 6 credit hours from the Faculty of Arts, which should include the required "W" course		12 credit hours of electives from: MATH 2030, MATH 2070, MATH 2160 (if not taken as a required 2nd year elective), MATH 2170 and all Year 3 and 4 mathematics courses	
15 credit hours of electives (review above list for acceptable electives)		12 credit hours of approved (not necessarily mathematics) electives (review above list for acceptable electives)	
30 credit hours	30 credit hours	30 credit hours	30 credit hours

NOTES:

1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (A) in place of MATH 1220, MATH 1500 (A) or MATH 1510 (A) in place of MATH 1230, MATH 1700 (A) or MATH 1710 (A) in place of MATH 1232, MATH 1690 (B) in place of MATH 1230 and MATH 1232.

2 Department strongly recommends choosing MATH 2160 as one of the electives in Year 2.

3 These courses may not be offered every year, but are usually offered once every second year. Please refer to Aurora Student for courses offered in the current year and to the website of the Department of Mathematics for the planned schedule of future course offerings.

Program modification:

Modifications to the **Bachelor of Science (Major) in Mathematics** are outlined on the next pages.

**MATHEMATICS
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Proposed Changes to the B.Sc. Major Degree in Mathematics

Current Four Year Major Requirements:

To enter the four year Major in Mathematics, a student must have a "C+" in either MATH 1690 or in two of MATH 1300, MATH 1500 and MATH 1700 or any equivalent and have satisfied all Faculty requirements for entry to the program.

To continue in the Mathematics Major degree program students must maintain a minimum DGPA of 2.00.

To graduate with the B. Sc. Major degree, a student must achieve a minimum GPA of 2.00 on the 120 credit hours that contribute to the degree, and a minimum grade of "C" in each of the Major Program Specific courses (see below).

Major Program Specific Courses

MATH 1300, MATH 1500, MATH 1700, (or MATH 1690 in place of MATH 1500 and MATH 1700), MATH 2202, MATH 2352, MATH 2600, MATH 2750, MATH 2800, MATH 3300, MATH 3350, MATH 3400, MATH 3700, MATH 3710, MATH 3740, MATH 3760, and MATH 3800.

It is suggested that among their electives, students might choose courses in which mathematics is extensively used, for example, courses in physics, chemistry and certain courses in economics. For advice on this point students should talk to a faculty member in the department.

Proposed Four Year Major Requirements:

To enter the Four Year Major in Mathematics, a student must have a minimum grade of "C+" in either MATH 1232 or MATH 1690, or a minimum grade of "B" in MATH 1700, and to have satisfied all Faculty requirements for entry to the program.

To continue in the Mathematics Major degree program students must maintain a minimum DGPA of 2.00.

To graduate with the B. Sc. Major degree, a student must achieve a minimum GPA of 2.00 on the 120 credit hours that contribute to the degree, and a minimum grade of "C" in each of the Major Program Specific courses (see below).

Major Program Specific Courses

MATH 1220, MATH 1230, MATH 1232, MATH 1240, MATH 2020, MATH 2030, MATH 2080, MATH 2090, MATH 2150, MATH 2160, MATH 2180, MATH 3320, MATH 3322, MATH 3340, MATH 3360, MATH 3390, MATH 3440, MATH 3460

List of Year 2 Mathematics Electives (of which two are required for the core requirements): MATH 2030, MATH 2040, MATH 2070, MATH 2140, MATH 2160, MATH 2170.

Other electives can be chosen from the general list of approved electives, as in the honours program. Students can also use mathematics courses as electives. For advice on these points, students should talk to a faculty member in the department.

Current Mathematics Major Program Chart:

5 MATHEMATICS FOUR YEAR MAJOR 120 CREDIT HOURS		
1 MATH 1300 , MATH 1 1 1500 , MATH 1700	MATH 2202, MATH 2352 (6),MATH 2600, MATH 2750 (6),MATH 2800	MATH 3300 or MATH 3350 (6), MATH 3400, MATH 3700 or MATH 3710, MATH 3740 (6) or MATH 3760 (6), MATH 3800 and enough courses from MATH 2400, MATH 2500, STAT 2000 and all third and fourth year Mathematics courses to make 48 credit hours
The following can be completed in Year 1 or Year 2: 2 2 STAT 1000 , COMP 1010 6 credit hours from the Faculty of Arts, which should include the required "W" course 18 credit hours of approved electives		12 credit hours of approved electives

- NOTES:
- 1 MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300; MATH 1710 may be taken in place of MATH 1700. MATH 1690 may be taken in place of both MATH 1500 and 1700).
- 2 STAT 1000 and COMP 1010 must be completed by the end of Year 2.
- 3 Students considering graduate work in pure mathematics should note that many graduate schools may require a student to rectify any deficiencies in MATH 4200, MATH 4210, MATH 4350, MATH 4710, MATH 4720 and MATH 4750.
- 4 MATH 3200, MATH 3210, MATH 3740 and MATH 3910 cannot be used in an Honours program.
- 5 IMPORTANT: The four year Major programs need not be completed in the manner prescribed in the charts above. Each chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. Please refer to the text above for the minimum requirements for entry to a four year Major.
- (Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Mathematics Major Program Chart:

MATHEMATICS FOUR YEAR MAJOR 120 CREDIT HOURS		
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240	MATH 2020, MATH 2080, MATH 2090, MATH 2150, MATH 2180 6 credit hours from the following: MATH 2030, MATH 2040, MATH 2070, MATH 2140, MATH 2160, MATH 2170	A total of 48 credit hours from MATH 2030, MATH 2070, MATH 2160, MATH 2170 and any 3000/4000 level Mathematics courses, which must include: MATH 2030 (if not already taken as Year 2 elective), MATH 2160 (if not already taken as Year 2 elective), MATH 3320, MATH 3322, MATH 3340, MATH 3360, MATH 3390, MATH 3440, MATH 3460
STAT 1000, COMP 1010 15 credit hours of approved electives The following must be completed in Year 1 or Year 2: 6 credit hours from the Faculty of Arts, which should include the required "W" course		12 credit hours of approved electives

NOTES:

1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (B) in place of MATH 1220, MATH 1500 (B) or MATH 1510 (B) in place of MATH 1230, MATH 1700 (B) or MATH 1710 (B) in place of MATH 1232, MATH 1690 (C+) in place of MATH 1230 and MATH 1232.

Rationale for changes and explanation of changes

This reflects the comprehensive undergraduate curriculum revision of the Department of Mathematics in response to the external review of the undergraduate programs in mathematics. The new mathematics curriculum implements a common core for both programs until the second term of year three, as well as a good amount of overlap between the Honours and Four Year Major programs later on. There are several objectives to the new program requirements and courses:

- Facilitate movement between programs.
- Eliminate duplications in the Mathematics curriculum.
- Simplify the orientation of students. Students in the first two years now have fewer variations on the same topic available. In higher level courses, there is no distinction between Honours and Major courses, but an Honours student will have to take more of the highest level courses and maintain a higher GPA.

Note that all of the proposed courses are 3 credit hour courses and that all first and second year courses include one tutorial hour per week.

New Mathematics Honours program specifically lists some courses that are planned to be run every second year as required or elective courses. Regardless of the year the students enter the program, such requirements can be satisfied, as shown below, see also tentative course offerings by term and year. The courses offered every other year are in bold font.

Required courses, honours pure concentration:

- **MATH 3410** or **MATH 3480**, either one is offered at any year;
- **MATH 4340** or **MATH 4360** or **MATH 4300**, either one of MATH 4340 and MATH 4360 is offered at any year.

Elective courses, honours applied concentration:

- additional 9 credit hours to be chosen from: MATH 3330, **MATH 4380**, MATH 3322, **MATH 4330**, **MATH 4390**, **MATH 4460**, MATH 4280, **MATH 4320**, MATH 4440, here either MATH 4330 or MATH 4390 is offered at any year, and the same is true for MATH 4460 and MATH 4320.

Elective courses, honours applied concentration:

- additional 6 credit hours to be chosen from: MATH 3360, MATH 4290, MATH 4450, **MATH 4240**, **MATH 4470**, MATH 4280, MATH 4270, where either MATH 4240 or MATH 4470 is offered at any year.

Program modification:

Modifications to the **Bachelor of Science (Double Honours) in Mathematics** are outlined on the next pages.

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Proposed Changes to the B.Sc. Double Honours Degree in Mathematics

Current Double Honours Degree in Mathematics Program:

Double Honours: A student may elect Honours in Mathematics and one other field, subject to the approval of both departments. The Mathematics prescription for a Double Honours program is as indicated in the table below.

4 MATHEMATICS HONOURS DOUBLE MINIMUM 120 CREDIT HOURS (comprising courses listed in chart below, and the required courses from the other department)			
1 MATH 1300 (B), MATH 1690(6) (B) 1 (or MATH 1500 and MATH 1700 (B)) 2 STAT 1000 2 COMP 1010 Plus 6 credit hours from the Faculty of Arts, which should include the required "W" course	MATH 2202, MATH 2352 (6),MATH 2600, MATH 2750 (6),MATH 2800	MATH 3230, MATH 3350 (6),MATH 3710, MATH 3760 (6)	MATH 3800 Plus 12 credit hours from MATH 4200, MATH 4210, MATH 4350,MATH 4710, MATH 4720, MATH 47503 Plus at least an additional 3 credit hours from among the above and MATH 3220, MATH 3240, MATH 3400, MATH 3430, MATH 3450,MATH 4250, MATH 4400, MATH 4410, MATH 4420, MATH 4430,MATH 4800, MATH 4920, MATH 4960

NOTES:

1 MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300; MATH 1710 may be taken in place of MATH 1700. MATH 1690 may be taken in place of both MATH 1500and 1700).

2 STAT 1000 and COMP 1010 must be completed by the end of Year 2.

3 Students considering graduate work in pure mathematics should note that many graduate schools may require a student to rectify any deficiencies in MATH 4200, MATH 4210, MATH 4350, MATH 4710, MATH 4720 andMATH 4750.

4 MATH 3200, MATH 3210, MATH 3740 and MATH 3910 cannot be used in an Honours program.

5 IMPORTANT: The four year Major programs need not be completed in the manner prescribed in the charts above. Each chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. Please refer to the text above for the minimum requirements for entry to a four year Major.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Mathematics Double Honours Program:

Double Honours: A student may elect Honours in Mathematics and one other field, subject to the approval of both departments. The Mathematics prescription for a Double Honours program is as indicated in the table below.

MATHEMATICS HONOURS DOUBLE MINIMUM 120 CREDIT HOURS (comprising courses listed in chart below, and the required courses from the other department)			
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240 STAT 1000 COMP 1010 Plus 6 credit hours from the Faculty of Arts, which should include the required "W" course	MATH 2020, MATH 2080, MATH 2090, MATH 2150, MATH 2180 6 credit hours from the following list: MATH 2030, MATH 2040, MATH 2070, MATH 2140, MATH 2160, MATH 2170	MATH 3320, MATH 3340, MATH 3390, MATH 3440, MATH 3470, MATH 3472	15 credit hours from: MATH 2030, MATH 2070, MATH 2160 (if not taken as a required 2nd year elective), MATH 2170; and all Year 3 and 4 mathematics courses of which at least 9 credit hours must be 4000 level.

NOTES:

1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (A) in place of MATH 1220, MATH 1500 (A) or MATH 1510 (A) in place of MATH 1230, MATH 1700 (A) or MATH 1710 (A) in place of MATH 1232, MATH 1690 (B) in place of MATH 1230 and MATH 1232.

Rationale for changes and explanation of changes

This reflects the comprehensive undergraduate curriculum revision of the Department of Mathematics in response to the external review of the undergraduate programs in mathematics.

First three years of the proposed double honours program are composed of the courses that are required in the math honours program in both concentrations. The total number of required courses remains the same - in the first year there is one more course required, the same number for the years 2 and 3, and the fourth year requires one less course compared to the current program. The choice in the year 4 has been simplified due to absence of non-honours versions of the courses in the new program (like, e.g., current MATH 3740).

Program modification:

Modifications to the following programs are outlined on the next pages:

- **Bachelor of Science (Major) in Applied Mathematics – Computer Science Option**
- **Bachelor of Science (Major) in Applied Mathematics – Economics Option**
- **Bachelor of Science (Major) in Applied Mathematics – Statistics Option**

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Proposed Changes to B.Sc. Major in Applied Mathematics with Option (Computer Science, Economics, Statistics)

Current Four Year Major in Applied Mathematics with Option (Computer Science, Economics, Statistics) requirements:

These programs provide a sound general knowledge of applied mathematics together with a significant number of courses in the option area. Courses in the Computer Science option provide training in aspects of computer science which are most useful to the practicing mathematician. Courses in the Computer Sciences, Economics, and Statistics options are fundamental to each area and provide a strong, mathematical basis for further study.

To enter the four year Major in Applied Mathematics with one of the above three options, a student must have a "C+" in either MATH 1690 or two of MATH 1200, MATH 1300, MATH 1500, or MATH 1700, one of which must be either MATH 1500, or MATH 1700, and have satisfied all faculty requirements for entry to the program.

To continue in the Applied Mathematics Major degree programs, students must maintain a minimum DGPA of 2.00.

To graduate with the B. Sc. Major degree, a student must achieve a minimum GPA of 2.00 on the 120 credit hours that contribute to the degree, and a minimum grade of "C" in each of the Major Program Specific courses (see below).

Applied Mathematics Major Program Specific Courses

MATH 1200, MATH 1300, MATH 1500, MATH 1700 (or MATH 1690 in place of MATH 1500 and MATH 1700), MATH 2300, MATH 2400, MATH 2600, MATH 2720, MATH 2730, MATH 2800, MATH 3500, MATH 3600, MATH 3700, MATH 3740, MATH 3800, MATH 3810, and MATH 3820.

It is recommended that students take all 12 credit hours of 1000 level mathematics courses in their initial 30 credit hours; however, students should take at least MATH 1300, MATH 1500 and MATH 1700. See the individual charts below for additional requirements for each option.

Options List: MATH 2450, MATH 2500, MATH 2552, the former MATH 2550, or any 3rd or 4th year Mathematics course.

Proposed Four Year Major in Applied Mathematics with Option (Computer Science, Economics, Statistics) requirements:

These programs provide a sound general knowledge of applied mathematics together with a significant number of courses in the option area. Courses in the Computer Science option provide training in aspects of computer science that are most useful to the practicing mathematician. Courses in the Computer Sciences, Economics, and Statistics options are fundamental to each area and provide a strong, mathematical basis for further study.

To enter the four year Major in Applied Mathematics with one of the above three options, a student must have a minimum grade of "C+" in either MATH 1232 or MATH 1690, or a minimum grade of "B" in MATH 1700, and have satisfied all faculty requirements for entry to the program.

To continue in the Applied Mathematics Major degree programs, students must maintain a minimum DGPA of 2.00.

To graduate with the B. Sc. Major degree, a student must achieve a minimum GPA of 2.00 on the 120 credit hours that contribute to the degree, and a minimum grade of "C" in each of the Major Program Specific courses (see below).

Applied Mathematics Major Program Specific Courses

MATH 1220, MATH 1230, MATH 1232, MATH 1240, MATH 2070, MATH 2080, MATH 2090, MATH 2140, MATH 2150, MATH 2160, MATH 2180, MATH 3340, MATH 3420, MATH 3440, MATH 3460, and MATH 3470.

It is recommended that students take all 12 credit hours of 1000 level mathematics courses in their initial 30 credit hours; however, students should take at least MATH 1230, MATH 1232, and MATH 1220. See the individual charts below for additional requirements for each option.

Options List: MATH 2030, MATH 2040, MATH 2170, or any 3000 / 4000 level MATH course

Current Applied Mathematics with Computer Science Option Program Chart:

5 APPLIED MATHEMATICS FOUR YEAR MAJOR with COMPUTER SCIENCE OPTION 120 CREDIT HOURS		
MATH 1200, MATH 1300, MATH 1500, MATH 1700 1 1 1 COMP 1010, COMP 1020	MATH 2300, MATH 2600, MATH 2720, MATH 2730, MATH 2800 COMP 2140	MATH 2400, MATH 3600, MATH 3700, MATH 3740 (6), MATH 3800, MATH 3810, MATH 3820
6 credit hours from the Faculty of Arts, which should include the required "W" course 6 credit hours of approved electives	STAT 1000 and STAT 2000 6 credit hours chosen from: MATH 2450 (6), MATH 2500, MATH 2552 (6), or any 3000 / 4000 level MATH course One of the following patterns (9 credit hours): Graphics: COMP 2190, COMP 3490, COMP 4490 Software: COMP 2150, COMP 3440; and one of: COMP 2160, COMP 3380, or COMP 3020 Theoretical Computer Science: COMP 2080, COMP 2130; and one of: COMP 3170 or COMP 4530 Hardware: COMP 2160, COMP 2280; and one of: COMP 3370 or COMP 3430 Artificial Intelligence: COMP 3190; and two of: COMP 4180, COMP 4190, COMP 4200, COMP 4360 27 credit hours of electives taken during years 2, 3 and 4	

NOTES:

1 MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300; MATH 1710 may be taken in place of MATH 1700. MATH 1690 may be taken in place of both MATH 1500 and 1700).

2 STAT 1000 and COMP 1010 must be completed by the end of Year 2.

3 Students considering graduate work in pure mathematics should note that many graduate schools may require a student to rectify any deficiencies in MATH 4200, MATH 4210, MATH 4350, MATH 4710, MATH 4720 and MATH 4750.

4 MATH 3200, MATH 3210, MATH 3740 and MATH 3910 cannot be used in an Honours program.

5 IMPORTANT: The four year Major programs need not be completed in the manner prescribed in the charts above. Each chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. Please refer to the text above for the minimum requirements for entry to a four year Major.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Applied Mathematics with Computer Science Option Program Chart:

APPLIED MATHEMATICS FOUR YEAR MAJOR with COMPUTER SCIENCE OPTION 120 CREDIT HOURS		
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240 COMP 1010, COMP 1020	MATH 2080, MATH 2090, MATH 2150, MATH 2160, MATH 2180 COMP 2140	MATH 2070, MATH 2140, MATH 3340, MATH 3420, MATH 3440, MATH 3460, MATH 3470
6 credit hours from the Faculty of Arts, which should include the required "W" course 6 credit hours of approved electives	STAT 1000 and STAT 2000 9 credit hours chosen from: MATH 2030, MATH 2040, MATH 2170, or any 3000 / 4000 level MATH course One of the following patterns (9 credit hours): Graphics: COMP 2190, COMP 3490, COMP 4490 Software: COMP 2150, COMP 2160 ; and one of: COMP 3380, COMP 3440 , or COMP 3020 Theoretical Computer Science: COMP 2080, and two of: COMP 3030 , COMP 3170, COMP 3820 , or COMP 4420 Hardware: COMP 2160, COMP 2280; and one of: COMP 3370 or COMP 3430 Artificial Intelligence: COMP 3190; and two of: COMP 4180, COMP 4190, COMP 4200, COMP 4360 27 credit hours of electives taken during years 2, 3 and 4	

NOTES:

1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (B) in place of MATH 1220, MATH 1500 (B) or MATH 1510 (B) in place of MATH 1230, MATH 1700 (B) or MATH 1710 (B) in place of MATH 1232, MATH 1690 (C+) in place of MATH 1230 and MATH 1232.

Current Applied Mathematics with Economics Option Program Chart:

<div>5</div> APPLIED MATHEMATICS FOUR YEAR MAJOR with ECONOMICS OPTION 120 CREDIT HOURS		
MATH 1200, MATH 1310, MATH 1500, MATH 1700 1 1 1 ECON 1010, ECON 1020 (or ECON 1210, ECON 1220)	MATH 2300, MATH 2600, MATH 2720, MATH 2730, MATH 2800	MATH 2400, MATH 3600, MATH 3700, MATH 3740 (6), MATH 3800, MATH 3810, MATH 3820, MATH 4310
9 credit hours of electives	STAT 1000, STAT 2000 COMP 1010 ECON 2530, ECON 3730 3 credit hours from: MATH 2450 (6), MATH 2500, MATH 2552 (6), or any 3000 / 4000 level MATH course 6 credit hours from: ECON 2450, ECON 2460, ECON 2470 and ECON 2480 24 credit hours of approved electives taken during years 2, 3 and 4	
3 credit hour "W" course must be taken in Year 1 or Year 2		

NOTES:

1 MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300; MATH 1710 may be taken in place of MATH 1700. MATH 1690 may be taken in place of both MATH 1500 and 1700).

2 STAT 1000 and COMP 1010 must be completed by the end of Year 2.

3 Students considering graduate work in pure mathematics should note that many graduate schools may require a student to rectify any deficiencies in MATH 4200, MATH 4210, MATH 4350, MATH 4710, MATH 4720 and MATH 4750.

4 MATH 3200, MATH 3210, MATH 3740 and MATH 3910 cannot be used in an Honours program.

5 IMPORTANT: The four year Major programs need not be completed in the manner prescribed in the charts above. Each chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. Please refer to the text above for the minimum requirements for entry to a four year Major.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Applied Mathematics with Economics Option Program Chart (combined with Economics proposal):

<div>5</div> APPLIED MATHEMATICS FOUR YEAR MAJOR with ECONOMICS OPTION 120 CREDIT HOURS		
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240 ECON 1010 and ECON 1020, or ECON 1210 and ECON 1220	MATH 2080, MATH 2090, MATH 2150, MATH 2160, MATH 2180	MATH 2070, MATH 2140, MATH 3340, MATH 3420, MATH 3440, MATH 3460, MATH 3470, MATH 4370
9 credit hours of electives	STAT 1000, STAT 2000 COMP 1010 ECON 2030 ECON 3030 6 credit hours from: MATH 2030, MATH 2040, MATH 2170, or any 3000 / 4000 level MATH course 6 credit hours from: ECON 2010 ECON 2020 ECON 3010 ECON 3020	
	24 credit hours of approved electives taken during years 2, 3 and 4	
3 credit hour "W" course must be taken in Year 1 or Year 2		

NOTES:

1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (B) in place of MATH 1220, MATH 1500 (B) or MATH 1510 (B) in place of MATH 1230, MATH 1700 (B) or MATH 1710 (B) in place of MATH 1232, MATH 1690 (C+) in place of MATH 1230 and MATH 1232.

Current Applied Mathematics with Statistics Option Program Chart:

5 APPLIED MATHEMATICS FOUR YEAR MAJOR with STATISTICS OPTION 120 CREDIT HOURS		
MATH 1200, MATH 1300, MATH 1500, MATH 1700 STAT 1000	MATH 2300, MATH 2600, MATH 2720, MATH 2730, MATH 2800 STAT 2000	MATH 2400, MATH 3600, MATH 3700, MATH 3740 (6), MATH 3800, MATH 3810, MATH 3820 STAT 2400, STAT 3400, STAT 3470, STAT 3480, STAT 3800
6 credit hours from the Faculty of Arts, which should include the required "W" course	COMP 1010 6 credit hours from: MATH 2450 (6), MATH 2500, MATH 2552 (6), or any 3000 / 4000 level MATH course 6 credit hours of 3000 or 4000 level Statistics courses	
9 credit hours of electives	18 credit hours of approved electives taken during years 2, 3 and 4	

NOTES:

1 MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300; MATH 1710 may be taken in place of MATH 1700. MATH 1690 may be taken in place of both MATH 1500 and 1700).

2 STAT 1000 and COMP 1010 must be completed by the end of Year 2.

3 Students considering graduate work in pure mathematics should note that many graduate schools may require a student to rectify any deficiencies in MATH 4200, MATH 4210, MATH 4350, MATH 4710, MATH 4720 and MATH 4750.

4 MATH 3200, MATH 3210, MATH 3740 and MATH 3910 cannot be used in an Honours program.

5 IMPORTANT: The four year Major programs need not be completed in the manner prescribed in the charts above. Each chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their programs with a view to satisfying the prerequisites of the required courses. Please refer to the text above for the minimum requirements for entry to a four year Major.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Applied Mathematics with Statistics Option Program Chart:

APPLIED MATHEMATICS FOUR YEAR MAJOR with STATISTICS OPTION 120 CREDIT HOURS		
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240 STAT 1000	MATH 2080, MATH 2090, MATH 2150, MATH 2160, MATH 2180 STAT 2000	MATH 2070, MATH 2140, MATH 3340, MATH 3420, MATH 3440, MATH 3460, MATH 3470 STAT 2400, STAT 3400, STAT 3470, STAT 3480, STAT 3800
6 credit hours from the Faculty of Arts, which should include the required "W" course	COMP 1010 9 credit hours from: MATH 2030, MATH 2040, MATH 2170, or any 3000 / 4000 level MATH course 6 credit hours of 3000 or 4000 level Statistics courses	
9 credit hours of electives	18 credit hours of approved electives taken during years 2, 3 and 4	

NOTES:

1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (B) in place of MATH 1220, MATH 1500 (B) or MATH 1510 (B) in place of MATH 1230, MATH 1700 (B) or MATH 1710 (B) in place of MATH 1232, MATH 1690 (C+) in place of MATH 1230 and MATH 1232.

Rationale for changes and explanation of changes

This reflects the comprehensive undergraduate curriculum revision of the Department of Mathematics in response to the external review of the undergraduate programs in mathematics.

The total number of required mathematical courses remains the same in all three proposed programs. The overall content of the required courses also remains the same, however, the level of exposition becomes higher. One of the notable differences is that MATH 2080 Introduction to Analysis becomes a required course, while its current counterpart MATH 2202 is not required in the applied mathematics with option programs.

In Phase 2 of the curriculum revision, more applied versions of some courses (e.g. numerical analysis) may become available. At that time we will consider allowing such courses for credit in this program.

There is a slight rearrangement of order of courses compared to the current program, in particular, MATH 3440 Ordinary Differential Equations is a third year course, while MATH 2800 is a second year course. On the other hand, MATH 2180 replaces MATH 3740 (or 3760) part A. As a result, the total number of required mathematics courses in the first and second year categories remain the same. As for the third/fourth year, there is one less required course due to optimization of differential equations sequence of courses. In place of former MATH 2800, MATH 3800 and MATH 3810, two new courses are required: MATH 3440 and MATH 3460, which do cover the key material of the three former courses. Hence the number of math electives is increased.

In the proposed theoretical computer science pattern COMP 2130 is no longer required and some other courses have been added as suggested by the department of Computer Science. Also, in Software pattern, COMP 2160 has been switched with COMP 3340 since COMP 2160 is a prerequisite for the required COMP 2150.

The Department of Economics plans a comprehensive curriculum revision to be implemented starting with Fall 2015. For Economics option, the proposed program includes the corresponding changes in the Economics portion of the program, as proposed by the Department of Economics.

Program modification:

Modifications to the following programs are set out on the next pages:

- **Bachelor of Science (General) in Mathematics**
- **Minor in Mathematics**

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Proposed Changes to the B.Sc. General Degree and Minor Requirements (Faculty of Science):

Current Mathematics General Degree and Minor Requirements:

THREE YEAR GENERAL (90 CREDIT HOURS)	
	18 credit hours of 2000, 3000, and (or) 4000 level Mathematics courses (subject to the Faculty requirement that of the 36 credit hours to be completed in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level.)"
MINOR	
1	1
MATH 1300 , MATH 1500 , MATH 1700	plus a minimum of 9 credit hours from: MATH 1200 and 2000 and (or) 3000 level Mathematics courses

1 MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300; MATH 1710 may be taken in place of MATH 1700. MATH 1690 may be taken in place of both MATH 1500 and 1700).

Proposed Mathematics General Degree and Minor Requirements:

THREE YEAR GENERAL (90 CREDIT HOURS)	
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240 ¹	18 credit hours of 2000, 3000, and (or) 4000 level Mathematics courses (subject to the Faculty requirement that of the 36 credit hours to be completed in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level.)"
MINOR	
1	1
MATH 1220 , MATH 1230 , MATH 1232	plus a minimum of 9 credit hours from: MATH 1240 and 2000 and (or) 3000 level Mathematics courses

1 MATH 1500 or MATH 1510 may be taken in place of MATH 1230; MATH 1300 may be taken in place of MATH 1220; MATH 1700 or MATH 1710 may be taken in place of MATH 1232. MATH 1200 may be taken in place of MATH 1240, but these courses are not equivalent, i.e., students should note that MATH 1240 is a prerequisite to some 2nd year mathematics courses for which MATH 1200 is not a prerequisite.

Rationale for changes and explanation of changes:

This reflects the comprehensive undergraduate curriculum revision of the Department of Mathematics in response to the external review of the undergraduate programs in mathematics.

Three year general. New first year courses are explicitly listed as required. For a student with weaker background, the choice of 18 credit hours on the 2nd and higher year level may be from courses that require only first year courses as prerequisites, for instance, MATH 2030, MATH 2040, MATH 2070, MATH 2140, MATH 2160. On 3rd year level, a student may choose MATH 3420 (in case MATH 2160 has been completed), MATH 3330 or MATH 3380 (in case MATH 2090 has been completed), MATH 3360 (in case MATH 2030 has been completed). We anticipate that even more choice will be available after we complete Phase 2 (Engineering and other service courses) of the revision, which will include, in particular, a more applied version of numerical analysis course and a practical introduction to ordinary differential equations. Note that this program can be completed without taking the more challenging MATH 2080. However, a mathematically inclined student can choose more advanced courses that are required in the mathematics honours and major programs.

Minor. The proposed requirements are consistent with the current requirements, with the difference that new first year courses are listed as required, with the footnote that the current first-year courses would still be allowed.

Program modification:

Modifications to the **Bachelor of Science Joint Honours in Mathematics – Computer Science** are set out on the next pages:

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Proposed Changes to the B.Sc. Joint Honours in Mathematics – Computer Science

Current Mathematics – Computer Science Joint Honours Program:

Mathematics - Computer Science Joint Honours Program (Including Co-op if selected)			
The departments of Computer Science and Mathematics offer a joint Honours program for in-depth study in both Computer Science and Mathematics.			
Honours Requirements			
To enter the Joint Honours Computer Science-Mathematics program, the student must have a minimum grade of "B" in each of COMP 1020, MATH 1300 and MATH 1700 (or any equivalent), and have satisfied the Faculty of Science requirements for entry to the honours program. It is recommended that STAT 2000 be completed in Year 1 as an elective.			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS (Including Cooperative Option if selected) 120 CREDIT HOURS			
COMP 1010 and COMP 1020(B) 1 MATH 1300 (B), MATH 1690(6) (B), 1 (or MATH 1500 and MATH 1700 (B)) STAT 1000 (C) 6 credit hours from the Faculty of Arts, which should include the required 3 credit hour "W" 2 course 6 credit hours of electives	3 COMP 2080 , COMP 2140,COMP 2160, COMP 2280 MATH 2202, MATH 2352 (6),MATH 2750 (6) one of: MATH 2600 or MATH 2800 Work Term (if Co-op 4 Selected) : COMP 2980	COMP 3030, COMP 3170, COMP 3370, COMP 3430, COMP 4340 (or COMP 4420) Three of: COMP 3020, COMP 3290, COMP 3350, COMP 3380, COMP 3720 Two of: COMP 4020, COMP 4050 , COMP 4290, COMP 4350,COMP 4380, COMP 4720 MATH 3740 (6) or MATH 3760 (6); and MATH 3350 (or MATH 3300 and MATH 3310) (6); and MATH 3400; and whichever of MATH 2600 or MATH 2800 not yet taken 12 credit hours of 3000 or 4000 level Mathematics courses, of which at least 3 credit hours must be 4000 level Work Term (if Co-op 4 Selected) : COMP 3980	4 Work Term (if Co-op Selected) : COMP 4980
30 Hours	30 Hours	30 Hours	30 Hours
NOTES:			
1 MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1310 may be taken in place of MATH 1300; MATH 1710 may			

be taken in place of MATH 1700.

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

3 Students in this program will not take COMP 2130 or COMP 3130. COMP 2130 is waived as a prerequisite for students in this program.

4 When chosen, the Cooperative Option work terms (2980, 3980, 4980) will normally be completed during the Summer Terms following years 2, 3, and 4 respectively. (Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Mathematics - Computer Science Joint Honours Program (combined with Computer Science proposal):

Mathematics - Computer Science Joint Honours Program (Including Co-op if selected)			
<p>The departments of Computer Science and Mathematics offer a joint Honours program for in-depth study in both Computer Science and Mathematics.</p> <p>Honours Requirements</p> <p>To enter the Joint Honours Computer Science-Mathematics program, the student must have a minimum grade of "B" in each of COMP 1020, either MATH 1232 or MATH 1690 (or a minimum grade of "A" in MATH 1700), and have satisfied the Faculty of Science requirements for entry to the honours program. It is recommended that STAT 2000 be completed in Year 1 as an elective.</p>			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS (Including Cooperative Option if selected) 120 CREDIT HOURS			
<p>COMP 1010 and COMP 1020(B)</p> <p>MATH 1220¹, MATH 1230¹, MATH 1232¹, MATH 1240</p> <p>STAT 1000 (C)</p> <p>6 credit hours from the Faculty of Arts, which should include the required 3 credit hour "W" course</p> <p>3 credit hours of approved electives</p>	<p>2</p> <p>COMP 2080 , COMP 2140, COMP 2160, COMP 2280</p> <p>MATH 2020, MATH 2080, MATH 2090, MATH 2150, MATH 2180</p> <p>3 credit hours of approved electives</p>	<p>COMP 3030, COMP 3170, COMP 3370, COMP 3430</p> <p>Three of: COMP 3010, COMP 3020, COMP 3290, COMP 3350, COMP 3380, COMP 3190, COMP 3440, COMP 3490, COMP 3820</p> <p>Three of: COMP 4020, COMP 4140, COMP 4180, COMP 4190, COMP 4290, COMP 4300, COMP 4340, COMP 4350, COMP 4360, COMP 4380, COMP 4490, COMP 4510, COMP 4580, COMP 4690, COMP 4710</p> <p>MATH 2030, MATH 2160, MATH 3320, MATH 3322, MATH 3440, MATH 3470, MATH 3472</p> <p>9 credit hours from MATH 2070, MATH 2170, any 3000 or 4000 level Mathematics courses, of which at least 3 credit hours must be 4000 level</p>	<p>3</p> <p>Work Term (if Co-op Selected) :</p> <p>COMP 4980</p>
30 Hours	30 Hours	30 Hours	30 Hours
<p>NOTES:</p> <p>1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (A) in place of MATH 1220, MATH 1500 (A) or MATH 1510 (A) in place of MATH 1230, MATH 1700 (A) or MATH 1710 (A) in place of MATH 1232, MATH 1690 (B) in place of MATH 1230 and MATH 1232.</p> <p>2 Students in this program will not take COMP 2130. COMP 2130 is waived as a prerequisite for students in this program.</p> <p>3 When chosen, the Cooperative Option work terms (2980, 3980, 4980) will normally be completed during the Summer Terms following years 2, 3, and 4 respectively.</p> <p>(Letters in brackets indicate minimum grade required for further study. The number 6 in brackets indicates a 6 credit hour course.)</p>			

Program modification:

Modifications to the **Bachelor of Science Joint Honours in Mathematics – Economics** are outlined on the following pages.

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Proposed Changes to the B.Sc. Joint Honours in Mathematics – Economics

Current Mathematics – Economics Joint Honours Program:

The Department of Mathematics along with the Department of Economics (Faculty of Arts) offer a joint Honours program for students wishing in depth study in Mathematics and Economics. For Economics course listings, refer to the Faculty of Arts chapter in the Calendar.			
To enter the Joint Honours Mathematics - Economics program, the student must have a minimum grade of "B" in: ECON 1010 ¹ and ECON 1020 (or ECON 1210 and ECON 1220), MATH 1300 ¹ , MATH 1700 ¹ and have satisfied the Faculty of Science requirements for entry to the honours program.			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS			
ECON 1010, ECON 1020 (or ECON 1210 and ECON 1220) MATH 1300 ¹ , MATH 1500 ^{1,2} , MATH 1700 ^{1,2} STAT 1000 ³ COMP 1010 ³	ECON 2700, ECON 2800 MATH 2202, MATH 2352 (6), MATH 2750 (6), MATH 2800	ECON 3700, ECON 3800, ECON 3180 ⁷ (or STAT 2000) ³ MATH 2600 ³ , MATH 3230, MATH 3300 ⁵ , MATH 3400, MATH 3700 (or MATH 3710), MATH 3740 (or MATH 3760) (6) 24 credit hours of approved Economics courses ⁴ 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, MATH 4310, or any Mathematics course at the 4000 level.	
9 credit hours of electives ⁶ , including the required "W" course.	6 credit hours of approved electives ⁶		
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 The combination of MATH 1500 ¹ and MATH 1700 ¹ 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 24 credit hours of electives in Economics in Years 3 and 4, no more than 6 credit hours may be at the 2000 level (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.

7 The prerequisite of ECON 3170 is waived for students in this program.

(The number 6 in brackets indicates a 6 credit hour course.)

Proposed Mathematics – Economics Joint Honours Program - (combined with Economics proposal):

The Department of Economics plans a comprehensive curriculum revision to be implemented starting with Fall 2015. The proposed program includes the corresponding changes in the Economics portion of the program, as proposed by the Department of Economics.

The Department of Mathematics along with the Department of Economics (Faculty of Arts) offer a joint Honours program for students wishing in depth study in Mathematics and Economics. For Economics course listings, refer to the Faculty of Arts chapter in the Calendar.			
To enter the Joint Honours Mathematics - Economics program, the student must have a minimum grade of "B" in: ECON 1010 and ECON 1020 (or ECON 1210 and ECON 1220), either MATH 1232 or MATH 1690 (or a minimum grade of "A" in MATH 1700), and have satisfied the Faculty of Science requirements for entry to the honours program.			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS			
Both ECON 1010 and ECON 1020, or both ECON 1210 and ECON 1220 MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ , MATH 1240 3 STAT 1000 3 COMP 1010 6 credit hours of electives, including the required "W" course.	ECON 2010 ECON 2020 MATH 2020, MATH 2080, MATH 2090, MATH 2150, MATH 2180 9 credit hours of approved electives	ECON 3010 ECON 3020 ECON 3040 ³ MATH 2030, MATH 2160, MATH 3320, MATH 3340, MATH 3440, MATH 3470, MATH 3472, 24 credit hours of approved Economics courses ³ 3 credit hours from MATH 2140, MATH 3420, MATH 3460, MATH 4370, or any Mathematics course at the 4000 level. 3 credit hours of Mathematics courses at the 3000 or 4000 level.	
30 Hours	30 Hours	30 Hours	30 Hours
NOTES:			
1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (A) in place of MATH 1220, MATH 1500 (A) or MATH 1510 (A) in place of MATH 1230, MATH 1700 (A) or MATH 1710 (A) in place of MATH 1232, MATH 1690 (B) in place of MATH 1230 and MATH 1232.			
2 Some courses may be taken in a different year than indicated; STAT 1000, COMP 1010, ECON 3040 may be taken in Year 2. The normal prerequisite for ECON 3040 is ECON 2040 [or the former ECON 3170 (018.317)], which will be waived for students in this program who have completed Year 1.			
3 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 and at least 6 credit hours must be at the 4000 level. Students are encouraged to take ECON 4010, ECON 4020 and			

Rationale for changes and explanation of changes

The Mathematics changes reflect the comprehensive undergraduate curriculum revision of the Department of Mathematics in response to the external review of the undergraduate programs in mathematics.

In the new proposal, there are 4 core mathematics courses in the first year, and 5 in the second. This is the same total amount of required mathematics courses in the first and second year compared to the current program (where it is 3+6). Consequently, we propose to change the number of electives in the first and second year appropriately, keeping the same totals as before.

The total number of hours and content of the required mathematics courses remains the same as in the current program.

Program modification:

Modifications to the **Bachelor of Science Joint Honours in Mathematics – Physics and Astronomy** are outlined on the following pages.

**MATHEMATICS
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Proposed Changes to the B.Sc. Joint Honours in Mathematics – Physics and Astronomy Program

Current Mathematics – Physics and Astronomy Joint Honours Program:

Honours Requirements			
<p>To enter the Joint Honours Mathematics – Physics Honours program the student must have a minimum grade of "B" in: MATH 1300¹, MATH 1510¹, MATH 1710¹ (or MATH 1690), PHYS 1050 (or "B+" in PHYS 1020) and PHYS 1070.</p> <p>To graduate with the B. Sc. Honours degree, a student must achieve a minimum DGPA of 3.00 and a minimum grade of "C+" in each of the Honours Program Specific courses, and a minimum grade of "C" on all remaining courses that contribute to the 129 credit hours of the degree. See the Calendar entry for each of the Department of Mathematics and the Department of Physics and Astronomy for the Honours Program Specific courses.</p>			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 129 CREDIT HOURS (129 credit hours)			
<p>MATH 1300¹ (B), MATH 1510¹ (B), MATH 1710¹ (B)</p> <p>PHYS 1050 (B) (or PHYS 1020(B+)) and PHYS 1070 (B)</p> <p>STAT 1000</p> <p>COMP 1010</p> <p>6 credit hours from the Faculty of Arts, which should include the required "W" course⁴</p>	<p>PHYS 2260, PHYS 2380, PHYS 2600, PHYS 2610, PHYS 2650</p> <p>MATH 2202, MATH 2352 (6), MATH 2750 (6), MATH 2800</p>	<p>MATH 3230, MATH 3350 (6) (or MATH 3300 and MATH 3310), MATH 3700 or MATH 3710, MATH 3760 (6)</p> <p>PHYS 3670, PHYS 3680, PHYS 3650, PHYS 3630, PHYS 3380</p> <p>3 credit hours from 3000 and 4000 level Physics Honours courses</p>	<p>MATH 3800, MATH 4810</p> <p>9 credit hours of 3000 or 4000 level Mathematics courses, of which 3 credit hours must be at the 4000 level</p> <p>PHYS 3430 (6), PHYS 3640⁵, PHYS 3660, PHYS 4390</p> <p>3 credit hours from 3000 and 4000 level Physics Honours courses</p>
27 Hours	33 Hours	36 Hours	33 Hours
<p>NOTES:</p> <p>1 MATH 1310 may be taken in place of MATH 1300; MATH 1500, or MATH 1520 may be taken in place of MATH 1510; MATH 1700 may be taken in place of MATH 1710. MATH 1690 may be taken in place of both MATH 1510 and 1710.</p> <p>2 PHYS 1030 is not suitable for entry to the 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.</p> <p>3 The corequisite of PHYS 2490 is waived. It is recommended that students audit PHYS 2390 and PHYS 2490 in second year.</p> <p>4 As there are no electives in Year 2 of the program, students should complete the university written English requirement in Year</p>			

1. If not completed in Year 1, a "W" course must be completed prior to Year 3 in addition to the required Year 2 courses.

5 The prerequisite of PHYS 2490 is waived.

6 The prerequisite of MATH 3810 has been waived for students who have completed PHYS 3630, PHYS 3640 and PHYS 3380.

(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)

Proposed Mathematics – Physics and Astronomy Joint Honours Program

Honours Requirements			
<p>To enter the Joint Honours Mathematics – Physics Honours program the student must have a minimum grade of "B" in: either MATH 1232 or MATH 1690 (or a minimum grade of "A" in MATH 1700), PHYS 1050 (or "B+" in PHYS 1020) and PHYS 1070.</p> <p>To continue in the Honours program, students must maintain a minimum GPA of 3.00, complete a minimum of 9 credit hours during each Fall and Winter Term.</p> <p>To graduate with the B. Sc. Honours degree, a student must achieve a minimum DGPA of 3.00, and a minimum grade of "C+" in each of the Honours Program Specific courses, and a minimum grade of "C" on all remaining courses that contribute to the 129 credit hours of the degree. See the Calendar entry for each of the Department of Mathematics and the Department of Physics and Astronomy for the Honours Program Specific courses.</p>			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 129 CREDIT HOURS (129 credit hours)			
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ (B), MATH 1240 PHYS 1050 (B) (or PHYS 2 1020(B+)) and PHYS 1070 (B) STAT 1000 COMP 1010 6 credit hours from the Faculty of Arts, which should include the required "W" 4 course	PHYS 2260, PHYS 2380,PHYS 3 2600, PHYS 2610,PHYS 2650 MATH 2020, MATH 2080, MATH 2090, MATH 2150, MATH 2180	MATH 3320, MATH 3340, MATH 3440, MATH 3460, MATH 3470, MATH 3472 PHYS 3670, PHYS 3680,PHYS 3650 , PHYS 3630 , PHYS 3380 3 credit hours from 3000 and 4000 level Physics Honours courses	MATH 3322 12 credit hours from: MATH 2030, MATH 2070, MATH 2160, MATH 2170, or any 3000 or 4000 level Mathematics courses, of which 3 credit hours must be at the 4000 level 5 PHYS 3430 (6), PHYS 3640 ,PHYS 3660, PHYS 4390 3 credit hours from 3000 and 4000 level Physics Honours courses
30 Hours	30 Hours	36 Hours	33 Hours
NOTES: 1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (A) in place of MATH 1220, MATH 1500 (A) or MATH 1510 (A) in place of MATH 1230, MATH 1700 (A) or MATH 1710 (A) in place of MATH 1232, MATH 1690 (B) in place of MATH 1230 and MATH 1232. 2 PHYS 1030 is not suitable for entry to the 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 The corequisite of PHYS 2490 is waived. It is recommended that students audit PHYS 2390 and PHYS 2490 in second year. 4 As there are no electives in Year 2 of the program, students should complete the university written English requirement in Year 1. If not completed in Year 1, a "W" course must be completed prior to Year 3 in addition to the required Year 2 courses. 5 The prerequisite of PHYS 2490 is waived.			

(Letters in brackets indicate minimum grade required for further study. The number 6 in brackets indicates a 6 credit hour course.)

Rationale for changes and explanation of changes

The Mathematics changes reflect the comprehensive undergraduate curriculum revision of the Department of Mathematics in response to the external review of the undergraduate programs in mathematics.

Total number of required mathematical courses remains the same, as well as the topics, there are some changes in the order of the material.

There will be one more math course in the first year and one less in the second year. Number of hours adjusted.

MATH 3440 and MATH 3460 are in third year now. MATH 4460 (every other year) cannot be required, therefore the number of math electives in the fourth year has been increased. MATH 3322 moved to the fourth year.

Year 3 of this program is quite loaded. In reality, many student do this program in five years.

Program modification:

Modifications to the **Bachelor of Science Joint Honours in Mathematics – Statistics** are outlined on the next pages.

**MATHEMATICS
PROGRAM MODIFICATIONS
EFFECTIVE 2015 FALL TERM**

Proposed Changes to the B.Sc. Joint Honours in Mathematics – Statistics

Current Mathematics – Statistics Joint Honours Program:

4.9.2.11 Mathematics - Statistics Joint Honours Program			
The departments of Statistics and Mathematics offer a joint Honours program for students wishing in depth study in Statistics and Mathematics.			
<p>To enter the Honours program students must have satisfied the Faculty of Science requirements for entry to the program, and have completed STAT 1000, MATH 1300 and either MATH 1690, or MATH 1500 and MATH 1700 or any equivalent with a minimum grade of "B" in each of STAT 1000 and MATH 1690 (or a "B" average in MATH 1500 and MATH 1700).</p> <p>To graduate with the B. Sc. Honours degree, a student must achieve a minimum DGPA of 3.00 and a minimum grade of "C+" in each of the Honours Program Specific courses, and a minimum grade of "C" on all remaining courses that contribute to the 120 credit hours of the degree. See the Calendar entry for each of the Department of Statistics and the Department of Mathematics for the Honours Program Specific courses.</p>			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
<p>1 MATH 1300 (B), MATH 1690(6) (B) (or MATH 1500 and MATH 1700 (B))</p>	<p>2 STAT 2000 , STAT 2400</p> <p>MATH 2202, MATH 2352 (6),MATH 2600, MATH 2750 (6),MATH 2800</p>	STAT 3050, STAT 3470, STAT 3480, STAT 3400, STAT 3800	STAT 4100, STAT 4520, STAT 4530
<p>The following courses must be taken in Year 1 or Year 2:</p> <p>STAT 1000 (B), COMP 1010</p> <p>6 credit hours from the Faculty of Arts, which should include the required "W" course</p> <p>12 credit hours of approved electives</p>		<p>Plus a total of 30 credit hours from: MATH 2400 and any 3000 / 4000 level Mathematics courses, which must include at least 3 credit hours at the 4000 level and must also include MATH 3230, MATH 3740 (6)(or MATH 3760 (6)), MATH 3350 (6) (orMATH 3300), MATH 3700 (or MATH 3710), MATH 3400 andMATH 3800</p> <p>6 credit hours of approved electives</p>	
30 Hours	30 Hours	30 Hours	30 Hours
<p>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 1710may be taken in place of MATH 1700.</p> <p>2 STAT 2000 may be taken in Year 1.</p> <p>(Letters in brackets indicate minimum prerequisite standing for further study. The number 6 in brackets indicates a 6 credit hour course.)</p>			

Proposed Mathematics-Statistics Joint Honours Program:

4.9.2.11 Mathematics - Statistics Joint Honours Program			
The departments of Statistics and Mathematics offer a joint Honours program for students wishing in depth study in Statistics and Mathematics.			
<p>To enter the Honours program students must have satisfied the Faculty of Science requirements for entry to the program, and have obtained a minimum grade of "B" in STAT 1000, either MATH 1232 or MATH 1690 (or a minimum grade of "A" in MATH 1700).</p> <p>To graduate with the B. Sc. Honours degree, a student must achieve a minimum DGPA of 3.00, a minimum grade of "C+" in each of the Honours Program Specific courses, and a minimum grade of "C" on all remaining courses that contribute to the 120 credit hours of the degree. See the Calendar entry for each of the Department of Statistics and the Department of Mathematics for the Honours Program Specific courses.</p>			
YEAR 1	YEAR 2	YEAR 3	YEAR 4
JOINT HONOURS 120 CREDIT HOURS (comprising courses listed in chart below, and electives)			
MATH 1220 ¹ , MATH 1230 ¹ , MATH 1232 ¹ (B), MATH 1240	2 STAT 2000 , STAT 2400 MATH 2020, MATH 2080, MATH 2090, MATH 2150, MATH 2160, MATH 2180	STAT 3050, STAT 3470, STAT 3480, STAT 3400, STAT 3800	STAT 4100, STAT 4520, STAT 4530
<p>The following courses must be taken in Year 1 or Year 2:</p> <p>STAT 1000 (B), COMP 1010</p> <p>6 credit hours from the Faculty of Arts, which should include the required "W" course</p> <p>12 credit hours of approved electives</p>		<p>Plus a total of 30 credit hours from: MATH 2070, MATH 2170 and any 3000 / 4000 level Mathematics courses, which must include at least 3 credit hours at the 4000 level and must also include</p> <p>MATH 2030, MATH 3320, MATH 3322, MATH 3340, MATH 3470, MATH 3472, MATH 3440, MATH 3460</p> <p>6 credit hours of approved electives</p>	
30 Hours	30 Hours	30 Hours	30 Hours
<p>NOTES:</p> <p>1 Students are strongly advised to take MATH 1220, MATH 1230, and MATH 1232. The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved: MATH 1300 (A) in place of MATH 1220, MATH 1500 (A) or MATH 1510 (A) in place of MATH 1230, MATH 1700 (A) or MATH 1710 (A) in place of MATH 1232, MATH 1690 (B) in place of MATH 1230 and MATH 1232.</p> <p>2 STAT 2000 may be taken in Year 1.</p> <p>Letters in brackets indicate minimum grade required for further study.</p>			

Rationale for changes and explanation of changes:

This reflects the comprehensive undergraduate curriculum revision of the Department of Mathematics in response to the external review of the undergraduate programs in mathematics.

Total number of required mathematical courses remains the same, as well as the topics, there are some changes in the order of the material.

One more core math course in the first year (MATH 1240), one less on the second year due to the fact that ODE will be taught in 3rd year (on higher level).

Report of the Senate Committee on Curriculum and Course Changes RE: Modifications to the Basic Faculty Regulations for the B.A. General, Advanced, and Honours Degrees concerning the Science Requirement, Faculty of Arts

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 meetings on April 1 and April 2, 2015, the committee considered a proposal from the Faculty of Arts to modify its Basic Faculty Regulations for the Bachelor of Arts General, Advanced, and Honours Degrees. In particular, the Faculty is proposing changes to the Science requirement for the B.A. degrees.

Observations:

1. The current Basic Faculty Regulations for the B.A. General, Advanced, and Honours Degrees specify that students must complete a minimum of six (6) credit hours of coursework offered by the Faculty of Science. The Faculty is proposing that the Regulations be amended to require that students complete a minimum of six (6) credit hours from a list of specific courses that would satisfy the Bachelor of Arts Science Requirement, as set out in the proposal. In addition to all courses in particular subjects in the Faculty of Science (BIOL, CHEM, COMP, FORS, MATH, MBIO, PHYS, and STAT), the list would also include selected courses offered by the Faculties of Agricultural and Food Sciences; Environment, Earth and Resources; and Engineering.
2. The objectives of the proposed changes are: (i) to address a reduction over time in the availability of Faculty of Science courses that are suitable options for Arts students; (ii) to provide Arts students with greater choice and flexibility in meeting the science requirement, and (iii) to begin to address the pressure for space in 1000-level courses offered by the Faculty of Science that are completed by students in other faculties, including Arts, as science requirements or electives.
3. The Faculty of Arts attributes the reduction in the number of Science course options for Arts students in recent years to (i) the creation of the Faculty of Environment, Earth and Resources, which resulted in courses in environmental sciences and geological sciences no longer being offered by the Faculty of Science, (ii) the introduction of Grade 12 Mathematics as a prerequisite for many 1000-level Science courses, and (iii) fiscal constraints that have led to a reduction in course sections and spaces in many Science elective courses that typically have been used by Arts students to meet the current Science requirement.
4. The criteria established by the Faculty, to identify courses that would satisfy the Bachelor of Arts Science Requirement, are that: (i) the course is offered by a faculty other than the Faculty of Arts, (ii) there is some reasonable avenue for an Arts students to complete the course, given constraints imposed by prerequisites and enrolment opportunities, and (iii) the course provides instruction in one or more topics that fall

under the twelve Natural Sciences or Engineering (NSE) topics identified by NSERC, and as outlined in Appendix II of the proposal. Additionally, the Committee was informed that courses that would satisfy the Bachelor of Arts Science Requirement must have a strong component of training in scientific methodologies. The criteria have been established to ensure that students would acquire a breadth of knowledge in their program, including instruction in the natural sciences.

5. The SCCCC was informed that a working group struck by the Associate Deans Undergraduate / University Liaison Officers last year is currently investigating the possibility of defining criteria to identify science-based course offerings that might be used to meet the science requirement in various programs across the University. The committee considered the possibility that the Faculty of Arts should wait for the working group to finish its work before modifying the Science requirement for B.A. degrees. The Committee decided against this on the basis that: (i) there is some urgency to expand the number of courses that Arts students could be used to meet the Science requirement, in response to bottlenecks in first year courses in the Faculty of Science, (ii) any faculty should be able to identify courses that would meet its own requirements for science course(s) and would provide the education or training students are expected to acquire in their program, (iii) the course list for the Bachelor of Arts Science Requirement would not be unique, as other faculties have previously established lists of courses that would satisfy requirements for science electives in their programs, and (iv) the revised regulation would benefit Arts students.
6. The SCCCC was assured that, should the University subsequently establish criteria for, and identify a list of, science-based courses that could be used to satisfy science requirements across University programs, the Faculty of Arts would modify the list of courses that satisfy the Bachelor of Arts Science Requirement to ensure that it was consistent with the University-level list of science-based courses.

Recommendation:

The Senate Committee on Curriculum and Course Changes recommends:

THAT Senate approve modifications to the Basic Faculty Regulations for the Bachelor of Arts General, Advanced, and Honours Degrees, Faculty of Arts, to expand the list of courses that would satisfy the six credit hour Science requirement, effective September 1, 2015.

Respectfully submitted,

Professor G. Smith, Acting Chair
Senate Committee on Curriculum and Course Changes

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

Faculty of Arts

Dean's Office
3rd Floor Fletcher Argue Building
University of Manitoba
Winnipeg, Manitoba
Canada R3T 5V5
Telephone (204) 474-9100
Facsimile (204) 474-7590
Email Arts-inquiry@ms.umanitoba.ca

DATE: January 27, 2015
TO: J. Taylor, Dean, Faculty of Arts
FROM: A. Osborne, Chair, Faculty of Arts Academic Regulations Policy Committee
SUBJECT: Report of the Faculty of Arts Academic Regulations Policy Committee
Proposal #1 – Science Requirement in Bachelor of Arts Degrees

The following proposal was approved at Arts Executive on February 4, 2015 followed by approval at Arts Faculty Council on February 12, 2015.

PREAMBLE

The terms of reference of the above Committee stipulate that it shall recommend to Faculty Council, through the Arts Executive Committee, with respect to undergraduate regulations relating to admissions, degree programs (General, Advanced, Honours, and Integrated Studies), examinations, grading systems, required performance levels and all requirements for receiving degrees. At its meeting of January 23, 2015, the Committee discussed the following matters.

1. Proposal from the Dean's Office to expand the list of courses that Faculty of Arts students can use to satisfy the six (6) credit hour Science requirement in Bachelor of Arts degrees.

Background:

Current, long-standing Faculty of Arts regulations state that students must complete a minimum of six (6) credit hours of course work offered by the Faculty of Science as part of their program of study.

Over the past several years, budgetary constraints, prerequisite changes, and the formation of the Clayton H. Riddell Faculty of Earth, Environment and Resources have contributed to the reduction and availability of courses normally used by Arts students to satisfy their Science requirement. The number of suitable "Science courses for Arts students" continues to shrink so the Dean's Office regularly receives appeals from Arts students asking that they be allowed to complete a science-related or scientific course (not offered by the Faculty of Science) that does not satisfy the "taught by Science" requirement. Unfortunately, our current regulations force the denial of these requests.

The Dean's Office recently reviewed science requirements in Bachelor of Arts degrees at several Canadian universities and courses offered at the University of Manitoba that could be considered scientific in nature - even though they are not taught by the Faculty of Science.

Observations:

This proposal comes from a desire to provide Arts students with more choice and greater flexibility in completing the science component of their degree. The Science requirement exists, in part, to ensure that students experience a certain breadth of study as part of their formal education. Expanding the current options to include courses offered by units other than the Faculty of Science, yet still considered scientific in nature would continue to provide Arts students with the intended breadth of study. The observations made by the Dean's office over the past several years that have led us to suggest this change are listed below.

1. Over the past several years, the number of Science options for Arts students has decreased. As a result, the Faculty of Arts regularly receives requests from students seeking permission to use courses from Environmental Science, Geological Sciences, Soil Science, etc. to satisfy, in whole or in part, the Faculty of Science course requirement. Current regulations prevent the Dean's Office from granting these requests.

There are several reasons for the reduction in available courses available to satisfy the current Bachelor of Arts Science requirement.

- a. With the creation of the Clayton H. Riddell Faculty of Earth, Environment, and Resources, courses offered by the departments of Environmental Science and Geological Sciences no longer satisfy the Science requirement because the Faculty of Science is no longer the faculty offering these courses.
 - b. The Faculty of Science has introduced Grade 12 mathematics as a prerequisite for almost all of its first-year courses. Many students admitted to Arts without a grade 12 math credit now lack the basic prerequisite for most first-year Science courses.
 - c. Recent budget constraints have resulted in the reduction of space in many Science courses not specifically required in Science programs. For example, COMP 1260 and MATH 1020, extremely popular choices amongst Faculty of Arts students, have had the number of sections and spaces reduced.
2. The vast majority of Canadian institutions we reviewed that have a science requirement in their Arts programs allow students to complete courses that are scientific in nature rather than requiring students to complete courses taught by a specific unit on campus, e.g., the Faculty of Science (see Appendix I for a summary of the institutions reviewed and applicable regulations). The Dean's Office views this as a reasonable way of having our students satisfy the Science requirement in Arts degrees.
 3. Many faculties, including Science, suffer from a lack of space in their first-year offerings. Allowing Arts students to select from a larger range of courses to satisfy the Science requirement could relieve some of this pressure.

It was unanimously RECOMMENDED that:

The Bachelor of Arts degree requirement stating that students must complete six credit hours of coursework taught in the Faculty of Science change to a requirement that would have students complete six credit hours of coursework from a specific list of courses considered to be scientific in nature. See Appendix II for information on the method used for creating the proposed list of courses.

If this recommendation is adopted, the following sections of the Undergraduate Calendar will require modification as outlined below:

Modify Point #2 in each of the following sections:

- 3.1.4 Ten Faculty Requirements for Graduating with a B.A. General Degree
- 3.2.4 Ten Faculty Requirements for Graduating with a B.A. Advanced Degree
- 3.3.4 Four Faculty Requirements for Graduating with a B.A. Honours Degree
- 4.5 Eight Faculty Requirements for Graduating with a B.A.I.S Degree

From:

2) There must be at least six credit hours from subject fields designated Humanities and at least six credit hours from subject fields designated Social Science, and at least six credit hours from ~~subject fields offered by the Faculty of Science~~ (see Section 5.1.1).

To:

2) There must be at least six credit hours from subject fields designated Humanities, at least six credit hours from subject fields designated Social Science, and at least six credit hours from **the list of courses that satisfy the Science requirement.** (See Section 5.1.1).

Modify Section 3.4, Requirement 7 of the Bachelor of Arts Program Requirement Chart:

From:

Requirement 7: Sciences Requirement

- 6 credit hours ~~from course subjects taught by the Faculty of Science~~

To:

Requirement 7: Science Requirement

- 6 credit hours **of coursework that satisfies the Science requirement (See Section 5.1.1 for a list of courses that satisfy the Bachelor of Arts Science Requirement)**

Modify Section 5.1.1 (4):

From:

Sciences

4) ~~Course subjects taught by the Faculty of Science that can be used towards the **Science** requirement: Astronomy, Biological Sciences, Biotechnology, Botany, Chemistry, Computer Science, Forensic Science, Mathematics, Microbiology, Physics, Statistics, and Zoology. (For details, see the Faculty of Science chapter of this *Calendar*.)~~

To:

4) Students may complete any combination of the courses listed below adding up to six hours to satisfy the Bachelor of Arts Science requirement.

Faculty of Science

All courses offered in these subjects in the Faculty of Science: BIOL, CHEM, COMP, FORS, MATH, MBIO, PHYS, STAT;

or courses taught by other faculties that can be used toward the Bachelor of Arts Science requirement:

Faculty of Agricultural and Food Sciences

AGRI 1500, AGRI 1510

ENTM 1000, ENTM 2050

PLNT 1000, PLNT 2500

SOIL 3060, SOIL 3520, SOIL 3600

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

ENVR 1000, ENVR 2000

GEOG 1290, GEOG 2200, GEOG 2250, GEOG 2272, GEOG 2520, GEOG 2530, GEOG 2540, GEOG 2550, GEOG 2700, GEOG 3390

GEOL 1340, GEOL 1400, GEOL 1410, GEOL 1420, GEOL 2390, GEOL 2440, GEOL 2500, GEOL 2540, GEOL 2570, GEOL 3310

Faculty of Engineering

ENG 1440, ENG 1450, ENG 1460

(Course titles and descriptions can be found by searching the Undergraduate Calendar on-line at:

<http://umanitoba.ca/calendar>)

Appendix I (Proposal #1)

Science Requirements at Other Canadian Institutions:

University of Winnipeg

c. The Science Requirement

Students must complete a minimum of 6 credit hours in Science courses at or above the 1000 level in the Bachelor of Arts, Bachelor of Business Administration, Bachelor of Kinesiology, and Bachelor of Physical and Health Education degrees and 18 credit hours at or above the 1000 level in the Bachelor of Science degree. In some cases, students may fulfil the Science Requirement and the Major Requirement with the same courses. In others, additional courses identified by the department must be taken. (Cross-listed courses will fulfil the Science requirement if one of the course numbers is designated as Science.)

The following University of Winnipeg subject area courses fulfil the Science requirement:

Anthropology:

Only ANTH-2300(3); ANTH-2304(3); ANTH-3207(3); ANTH-3302(3); ANTH-3306(3); ANTH-3308; ANTH 3309(3); ANTH-4212(3); ANTH-4302(3); ANTH-4303(3); ANTH-4305(3); ANTH-4307(3); ANTH-4308(3); ANTH-4309(3); ANTH-4311(3).

Applied Computer Science:

All courses except ACS-1453(3), ACS-1803(3), ACS-2916(3).

Biology: All courses

Chemistry: All courses except CHEM-0100(3)

Environmental Studies and Sciences:

Only ENV-1600(3); ENV-2603(3); ENV-2604(3); ENV-3476(3)

Geography:

Only GEOG-1201(3); GEOG-1202(3); GEOG-2207(3); GEOG-2210(3); GEOG-2213(3); GEOG-2214(3); GEOG-2215(3); GEOG-2216(3); GEOG-2218(3); GEOG-2219(3); GEOG-2304(3); GEOG-2306(3); GEOG-2316(3); GEOG-3210(3); GEOG-3215(3); GEOG-3306(3); GEOG-3307(3); GEOG-3319(3); GEOG-4203(3); GEOG-4212(3); GEOG-4231(3); GEOG-4320(3); GEOG-4321(3); GEOG-4322(3);.

History:

Only HIST-2900(6).

Kinesiology and Applied Health:

Only KIN-2201(3); KIN-2202(3); KIN-2204(3); KIN-2301(3); KIN-2304(3); KIN-2500(3); KIN-2501(3); KIN-3106(3); KIN-3107(3); KIN-3201(3); KIN-3304(3); KIN-3500(6); KIN-3501(3); KIN-3502(3); KIN-3505(3); KIN-4201(3); KIN-4207(3); KIN-4301(3); KIN-4500(6); KIN-4501(3); KIN-4502(3)

Mathematics:

All courses except MATH-2305(3)

Physics: All courses

Psychology:

Only PSYC-2101(3); PSYC-2102(3); PSYC-2600(3); PSYC-2610(3); PSYC-2620(3); PSYC-2800(3); PSYC-2900(3); PSY-2920(3).

Sociology:

Only SOC-2125(3)

Statistics: All courses

Note:

The following courses do not fulfil the Science requirement for the BA degree: Courses offered by the History Department in the History of Science area other than HIST-2900(6). Note: HIST-2900(6) and MATH/PHIL-2901(3) can be used to fulfil either the Humanities requirement or the Science requirement.

University of British Columbia

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,197,282,55>

Science Requirement

It is important that students understand and appreciate scientific methods, applications and reasoning.

The requirement can be met by successful completion of 6 credits chosen from:

1. Courses within the Faculty of Science
2. These courses in the Faculty of Arts:
 1. ASIC 200
 2. GEOB 102, 103, or any other GEOB courses
 3. LING 209
 4. PSYC science courses (263, 348, 360, 361, 363, 364, 365, 366, 367, 368, 448, 460, 461, 462, 463, 465, 466, 467, 469)
 5. GRSJ 201 (cross-listed with CPSC 101)
3. These courses in the Faculty of Forestry: FRST 303, 304
4. These courses in the Faculty of Land and Food Systems: APBI 244, 260, 311, 327, 328; FNH 200, 250.
5. These courses in the Faculty of Medicine: ANAT 390, 391; CAPS 390, 391.

Students may take any combination of the courses listed above adding up to 6 credits to satisfy the Science Requirement.

Important Note: The Faculty of Science offers several courses with overlapping content. Students may not earn credits for two courses with significant overlap. Students are advised to review the [Science Credit Exclusion Lists](#) to avoid registering in overlapping courses.

University of Regina

Credit hours	Core requirements summary, see details above	Student's record of courses completed
3.0	Any course in MATH, STAT, CS (except CS 100), PHIL 150, 352, 450, 452, 460, SOST 201, ECON 224	
3.0	Any course in ASTR, BIOL, CHEM, GEOL or PHYS that has a laboratory component, or GEOG 121	

Brandon University

<https://www.brandonu.ca/calendar/files/2010/04/Undergraduate-Calendar-2013-141.pdf> (p.40)

6.3.1 LIBERAL EDUCATION REQUIREMENTS

All students in the Faculties of Arts and Science must fulfill a minimum of six credit hours of specified courses in each of the areas of the Humanities, Social Sciences and Natural Sciences...

...c) Students who have met the requirements for a Major in Biology, Chemistry, Computer Science, Geology, Mathematics, Physics, or Distributed Major will not be required to complete a further 6 credit hours of courses in the Natural Sciences.

d) Students who major in Geography who seek the B.Sc. degree will not be required to take a further six credit hours in the Natural Sciences. Students majoring in Geography who seek the B.A. degree will not be required to take a further six credit hours in the Social Sciences....

C. Natural Sciences

15:132 Human Anatomy and Physiology 6	15:151 The Biology of Life 3
15:152 Biological Diversity 3	15:162 Cells, Genetics and Evolution 3
15:163 Biodiversity, Functions and Interactions 3	18:160 General Chemistry I 3
18:170 General Chemistry II 3	38:170 Introduction to Physical Geography 3
38:190 Intro to Weather and Climate 3	42:160 Intro to Earth Science 3
42:161 Historical Geology 3	42:162 Our Dynamic Earth 3
42:163 This Old Earth: A Trip Through Time 3	62:160 Computer Science I 3
62:161 Computer Science II 3	62:181 Calculus I 3
62:182 Introduction to Linear Algebra 3	74:151 General Physics I 3
74:152 General Physics II 3	74:161 Foundations of Physics I 3
74:162 Foundations of Physics II 3	74:184 Solar System Astronomy 3
74:185 The Galaxy and the Universe 3	

University of Western Ontario

<http://www.uwo.ca/arts/counselling/img/pdf/science.pdf>

Breadth Requirements

In first year, students must include 1.0 course from each of two of the three categories A, B, and C, noted below. Prior to graduation, students must successfully complete 1.0 course from each of Categories A, B, and C.

The Categories

CATEGORY A (Social Science / Interdisciplinary / Multidisciplinary)...

CATEGORY B (Arts / Humanities / Languages)...

CATEGORY C

Engineering

Chemical and Biochemical Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, Engineering Science, Green Process Engineering, Mechanical and Materials Engineering, Software Engineering

Medical Science

Anatomy and Cell Biology, Biochemistry, Epidemiology and Biostatistics, Medical Biophysics, Medical Sciences, Microbiology and Immunology, Pathology, Pathology and Toxicology, Pharmacology and Toxicology, Physiology Science Actuarial

Science

Applied Mathematics, Astronomy, Biology, Calculus, Chemistry, Computer Science, Differential Equations, Earth Sciences, Environmental Science, History of Science, Linear Algebra, Mathematics, Physics, Planetary Science, Statistical Sciences

Various

Communication Sciences and Disorders

**Students who completed Childhood and Family Relations, International and Comparative Studies, and Linguistics prior to September 1, 2007 are permitted to graduate with these courses recognized as Category B.*

*** Writing courses restricted to English as a Second Language students (e.g., Writing 0001F/G, 0002F/G, 1021F/G, 1022F/G) do not qualify as Category B courses.*

Need a Category C/Science course?

- Click [HERE](#) for the printable PDF version

Many of the following courses are courses students take to fulfill their Science requirement.

Check your program to see whether you need a specific course. You must also check the prerequisites and anti-requisites in the calendar to be sure you are eligible for the course.

Note that some of the courses are not sufficient to prepare you for senior level courses in the same subject. You can tell by reviewing the course description and the prerequisites of senior courses.

** Courses which require no previous Science background.*

- Actuarial Science 1021A/B*
- Astronomy 1021*
- Biology 1201A, 1202B, 1225* (Online), 1229F/G*, 1290B
- Calculus 1000A/B, 1100A/B, 1301A/B
- Chemistry 1027A/B*, 1100A/B

- Computer Science 1101A/B*, 1026A/B*, 1033A/B
- Earth Science 1022A/B*, 1023A/B*, 1070A/B, 1081A/B*, 1083F/G*, 1086F/G (Online), 1088F/G*, 1089F/G*
- Environmental Science 1021F/G*
- Mathematics 0110A/B, 1120A/B, 1225A/B, 1228A/B, 1229A/B, 1600A/B
- Physics 1021*, 1028A/B
- Statistical Science 1023A/B, 1024A/B

Senior Level Courses (Check for Prerequisites)

- Actuarial Science 2053
- Astronomy 2021A/B*, 2022A/B*
- Biology 2001A/B*
- Computer Science 2050F/G
- Earth Science 2123A/B*
- History of Science 2200E*, 2220*
- Philosophy 2203E* (cross listed with History of Science 2200E)
- Physics 2032A/B*, 2065A/B*, 2070A/B*
- Statistical Science 2037A/B*

Appendix II (Proposal #1)

Method used to identify U of M Courses that can satisfy the B.A. Science Requirement

For the purposes of this proposal and based primarily on the accepted national definition and framework for defining scientific study in the natural sciences and engineering, the Faculty of Arts defines any course as meeting the Science requirement for Bachelor of Arts Degrees if all four of the following conditions apply:

1. The course is offered by a faculty other than the Faculty of Arts;
2. The course appears on the official Faculty of Arts list of approved courses that meet the Science requirement;
3. There is some reasonable avenue for an Arts student to complete the course, given constraints imposed by prerequisites and enrolment opportunities; and,
4. The course provides instruction in one or more of the topics that fall under the 12 Natural Sciences or Engineering (NSE) topics listed below.

Topics that correspond to the NSE guidelines and are eligible for NSERC funding include:

1. Genes, Cells, and Molecules
2. Biological Systems and Functions
3. Evolution and Ecology
4. Chemistry
5. Physics
6. Geosciences
7. Computer Science
8. Mathematics and Statistics
9. Civil, Industrial, and Systems Engineering
10. Electrical and Computer Engineering
11. Materials and Chemical Engineering
12. Mechanical Engineering

For a full listing of subjects covered under the NSE umbrella, please visit NSERC's list of evaluation groups and research topics found here: <http://bit.ly/NSERCEvalRes>

Note #1: Should a University-wide committee be struck to identify a specific set of courses that satisfy a science requirement, the Faculty of Arts will adjust the above list of courses accordingly.

Note #2: The Faculty of Arts Policy Committee discussed the possibility of expanding the list of acceptable courses to include HNSC 1200 and HNSC 1210. Upon further review of course titles and descriptions, and the NSE guidelines, the Policy Committee felt comfortable leaving them off of the list of acceptable courses that can be used to satisfy the Science requirement in an Arts degree.

Supporting Documentation from the Faculty of Agriculture

From: Jared Carlberg
Sent: December 19, 2014 12:31 PM
To: Jason Leboe-McGowan
Cc: Karin Wittenberg; Wendy Kramer
Subject: Re: Arts Proposal

Dear Dr. Leboe-McGowan,

I am writing in response to your email below and your memo dated September 29th, 2014 in which you request permission from the Faculty of Agricultural and Food Sciences to list a subset of our courses as among those which would be eligible to partially satisfy your Faculty's requirement that students take six credit hours of Science courses as part of their degree programs. Our Faculty values the service that Arts provides to our students and welcomes the opportunity to have your students learn more about the disciplines in Agricultural and Food Sciences. Accordingly, be advised that we not only do not object to the inclusion of the courses identified in your memo (AGRI 1500 and 1510, ENTM 1000 and 2050, PLNT 1000 and 2500, SOIL 3060, 3520, and 3600), but also would encourage you to consider including some others that we believe would be appropriate to satisfy your Science requirement. Examples of such courses are HNSC 1200, 1210 and 2130 (all available online) and FOOD 1000 (there may be others). Please be aware that many of our courses have laboratory components, and that you should carefully review the calendar entries and/or course outlines for each to ensure it does in fact qualify to help satisfy your Science requirement.

Given that space in some of these courses is very tight (AGRI 1500 is perhaps the best example; it is among our Faculty core requirements and is always full & often over-subscribed), and to ensure that the needs of students in our own degree programs are met, we will ask you to submit reserve requests to us for those courses for which you would like Arts students to have access. After consideration, we will assign reserve space based on your request and the Guidelines for Management of Reserved Seats.

Please do not hesitate to let me know if you have any further questions or concerns about this matter.

Sincerely,

Jared Carlberg, Ph.D.
Acting Associate Dean (Academic)
Faculty of Agricultural and Food Sciences
261 Agriculture Building
University of Manitoba
204.474.9395
Jared.Carlberg@Umanitoba.ca

Supporting Documentation from the Clayton H. Riddell Faculty of Earth, Environment, and Resources

From: Norman Halden

Date: October 7, 2014 at 3:40:33 PM CDT

To: Jason Leboe-McGowan

Cc: Jason Jorgenson, Mary Benbow

Subject: Courses that Satisfy the Faculty of Arts Science Requirement

Dear Dr. Leboe-McGown,

Further to your memo of September 29th regarding Faculty of Arts Science Requirements, we have no difficulty with you identifying the courses in your memo as meeting the Faculty of Arts Science requirement. On discussing this in our dean's office, you may also wish to consider:

GEOG 2200 Introduction to Thematic Cartography (TS) Cr.Hrs. 3

GEOG 3390 Introduction to Climate Change and Its Causes (PS) Cr.Hrs. 3

GEOL 3310 Paleontology Cr.Hrs. 3 (Lab Required) (Formerly 007.331)

Norman M. Halden Ph.D., P.Geo., F.G.S., Dean

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

440 Wallace Building

University of Manitoba

Winnipeg, MB R3T 2N2

Phone 204 4 7 4 7248

email: nm_halden@umanitoba.ca

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Supporting Documentation from the Faculty of Engineering

From: Jonathan Beddoes

Date: October 6, 2014 at 9:51:01 AM CDT

To: Jason Leboe-McGowan

Cc: Nariman Sepehri

Subject: Courses that Satisfy the Faculty of Arts Science Requirement

Jason,

Your memo of 29 September 2014 requests that the following engineering courses:

ENG 1440

ENG 1450 and

ENG 1460

be added to the list of courses that satisfy the requirement for BA students to take 6 credit hours of courses that are scientific in nature.

The academic content of all courses in the Faculty of Engineering is categorized in terms of the major curriculum components. The courses above have the following components:

ENG 1440 - 100% Engineering Science

ENG 1450 - 100% Engineering Science

ENG 1460 - 25% Natural Science and 75% Engineering Science

For information:

Natural Science content is intended to impart an understanding of natural phenomena and relationships through the use of analytical and/or experimental techniques.

Engineering Science subjects involve the application of mathematics and natural science to practical problems.

Based on this curriculum information, I will leave it to your Faculty to decide if these courses satisfy your requirement for courses that appear to be scientific in nature.

It should be noted that all three of these courses have strict prerequisite requirements. For all three courses the prerequisites are high school completion with a minimum grade of 60% of Mathematics 405, Physics 405 and Chemistry 405. Students without these prerequisites will not be allowed to register in these courses as their probability of success will be very low.

These three courses are compulsory for all engineering programs. Each academic year the Faculty offers five sections of each course for a total capacity of 400 students. Given demand for engineering programs, all three courses are currently oversubscribed with many students not able to register in these courses.

I trust the foregoing is useful. If you have any questions, please do not hesitate to contact me.

Regards,

Jonathan Beddoes



UNIVERSITY
OF MANITOBA

Faculty of Science

Office of the Dean
239 Machray Hall
Winnipeg, Manitoba
Canada R3T 2N2
Telephone: 204-474-8256
Fax: 204-474-7618
Toll Free: 1-800-432-1960 ext. 8256

October 20, 2014

Dear Greg,

Thank-you for the opportunity to review the proposal from the Faculty of Arts to provide a larger sample of courses acceptable for students in the Faculty of Arts rather than being limited to "courses offered by the Faculty of Science". While we recognize the challenge with finding space in these courses available to Arts students, we regret that resources have not been sufficient to provide the required space. We support the proposal in principle and hope to work toward achieving the objective in the near future. However, we have a number of concerns with the timing of the proposal and the choice of courses without considering input from the university community.

In general, we feel that this proposal is premature since a university committee was developed last Spring to address the science ("s") based course offerings and provide specific criteria that may be used to designate science based courses. The timing of this proposal by the Faculty of Arts would set in motion similar proposals from a number of other Faculties, each with their own, and perhaps skewed, concept of what constitutes a science based course. Similar proposals for arts ("a") based courses may also follow, ultimately resulting in a random selection of course choices required by each Faculty within the university. If a random course selection is the desired end result, then the proposal may achieve its goal. However, if the purpose of the requirement is breadth in undergraduate student education (which is stated in the proposal), then a more careful selection of criteria by the entire university community for science and arts based courses is needed.

The concerns may be summarized as follows:

- 1) There is a need for a thorough understanding of the reason for the requirement that students take 6 CR from the Faculty of Science (and 6 CR from the Faculty of Arts) to ensure the purpose of the requirement is maintained.
- 2) The course selection for those designated as science (or arts) based courses needs specific criteria defined, as a guideline for selecting courses, to be consistent with the original intention of the requirement.
- 3) The selection of criteria needs a concerted effort from all parties involved simultaneously in order to avoid a random course selection and departure from the underlying reason behind the purpose of the requirement.
- 4) It would be in the best interest of everyone if a standing committee was formed on "s" and "a" based course selection to ensure course introductions and modifications conform to the established criteria.

While we support the proposal in principle, we feel it is premature because the university level committee has not had sufficient time to complete its task. We would be happy to work with the Faculty of Arts and the university community to develop criteria for course selection of "s" and "a" based courses to improve the available choice of courses for all students.

Sincerely,

A handwritten signature in cursive script, reading "Michele Piercey-Normore".

Michele Piercey-Normore
Associate Dean (undergraduate studies)



UNIVERSITY
OF MANITOBA

Faculty of Arts

Dean of Arts
310 Fletcher Argue Bldg.
Winnipeg, Manitoba
Canada R3T 5V5
Tel. (204) 474-9271
Fax (204) 474-7590
Email jeff_taylor@umanitoba.ca

DATE: 29 April 2015

TO: Stefi Baum, Dean of Science

FROM: Jeff Taylor, Dean of Arts

SUBJECT: Science Requirements in the Bachelor of Arts Program

This is to confirm that the Faculty of Arts will accept as satisfying the science requirement in the Faculty of Arts all of and only the 'S' (Science) courses that result from the work of the Associate Deans Undergraduate 'S'-based Courses Subcommittee and are approved by Senate, with the following exception. The Faculty of Arts may choose to determine, consistent with all relevant Senate policies, that some or all 'S' courses offered by the Faculty of Arts do not satisfy this requirement in the Bachelor of Arts, in the event that any courses in the Faculty of Arts are so designated.

Report of the Senate Committee on Instruction and Evaluation RE: Proposed Policy on Non-Academic Requirements for Graduate Nursing Programs

Preamble:

1. The terms of reference for the Senate Committee on Instruction and Evaluation (SCIE) are found on the web at:
http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/502.htm
2. At its meeting on March 19, 2015, the Committee considered a Report from the Faculty Council of Graduate Studies on Program and Curriculum Changes concerning a proposal, from the College of Nursing, to establish a policy on Non-Academic Requirements for Graduate Programs in Nursing.

Observations:

1. The College of Nursing is proposing to establish a policy on Non-Academic Requirements for Graduate Nursing programs, that would require that students admitted to graduate Nursing programs demonstrate that they meet a number of non-academic admission requirements, including: Criminal Record Search Certificate including Vulnerable Sector Search, Adult and Child Abuse Registry Checks, immunizations, Cardiopulmonary Resuscitation (CPR) Certification at the Health Care Provider level, Respiratory Mask-Fit Testing, and Winnipeg Regional Health Authority (WRHA) Personal Health Information Act (PHIA) Training. Students who did not submit the required documentation by July 15 would be put on hold and would not be able to register in courses before the requirements were met.
2. In addition, the policy requires that returning students whose CPR certification would expire before the end of the following academic year would have to be recertified and submit proof of their certification by June 1 of the current year. Students who would complete a clinical practice course in the summer term would be required to submit proof of their certification by April 15. Students who did not meet the requirements by the appropriate deadline would be put on hold, which would prevent them from registering for courses.
3. The objective of the policy is to ensure compliance with the requirements of the WRHA that students who will complete a clinical placement at a WRHA facility have completed the non-academic requirements described in observation 1.

Recommendation:

The Senate Committee on Instruction and Evaluation recommends:

THAT Senate approve the Report of the Senate Committee on Instruction and Evaluation concerning a proposed policy on Non-Academic Requirements for Graduate Nursing Programs, effective September 1, 2015.

Respectfully submitted,
Dr. Janice Ristock, Chair
Senate Committee on Instruction and Evaluation

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

Report of the Faculty Council of Graduate Studies on Program and Curriculum Changes

Preamble:

1. The Faculty of Graduate Studies has responsibility for all matters relating to the submission of graduate course, curriculum and program changes. Recommendations for new programs or changes are submitted by the Faculty Council of Graduate Studies for the approval of Senate.
2. The Faculty Council of Graduate Studies voted via email on February 18, 2015 to consider a proposal from the College of Nursing.

Observations

1. The **College of Nursing** proposes to implement a policy and procedures document addressing non-academic requirements for all graduate programs in Nursing. This is as follows:

The Winnipeg Regional Health Authority (WRHA) has mandated that all students attending their facilities as a student must meet the following requirements according to their standards:

- Criminal Record Search Certificate, including Vulnerable Sector Search
- Adult Abuse Registry Check
- Child Abuse Registry Check
- Immunizations
- CPR at the Health Care Provider Level
- Respiratory Mask Fit Testing
- WHRA Personal Health Information Act (PHIA) Training

In order to meet these standards, the Curriculum Governance & Quality Assurance Committee: Graduate Programs is recommending the following policy and procedure for students in the graduate Nursing programs:

Students admitted to the graduate Nursing programs will be required to submit, by the published deadline, the following non-academic admission requirements: Criminal Record Search Certificate including Vulnerable Sector Search, Adult and Child Abuse Registry Checks, immunizations, CPR certification, Respiratory Mask-Fit Testing, and WHRA Personal Health Information Act (PHIA) Training.

Students who do not meet the requirements and submit documentation by July 15 will be placed on hold and not permitted to register for courses until the requirements are met.

Report of the Faculty Council of Graduate Studies on Program and Curriculum Changes

CPR certification at the Health Care Provider Level must be current to the end of the following academic year (i.e., April). Returning students whose CPR expires prior to April of the next academic year will be required to recertify and submit proof of certification by June 1st of the current year. All students taking a clinical practice course in the summer term will be required to submit their CPR by April 15. Students who fail to submit their CPR as required will be placed on hold, thus prohibiting registration for courses or starting classes.

Rationale for the policy and procedures:

1. If students do not meet all of the requirements, they would be unable to complete the clinical practice requirement of some of the courses, and data collection or other work as a student in a WRHA facility.
2. The majority of the students work as Registered Nurses for the WRHA; however, the WRHA administration is not vigilant about ensuring that staff meet the requirements.
3. A significant number of students fail to comply with the current immunization and CPR policies in a timely way. This situation creates additional work for student services staff and the associate dean, who must respond to numerous emails and telephone calls from students who either do not wish to meet the requirements or who think they have met the requirements and ignore repeated requests for the missing information.
4. The policy would ensure that all graduate Nursing program students would meet the requirements before registration for courses.

Approved by the Curriculum Governance & Quality Assurance Committee: Graduate Programs; May 27, 2014

Approved by the College of Nursing Executive Committee; September 10, 2014

Recommendations

The Faculty Council of Graduate Studies recommends THAT: the program changes from the unit listed below be approved by Senate:

College of Nursing

Respectfully submitted,

Dean J. Doering, Chair
Graduate Studies Faculty Council

/ak

Report of the Senate Committee on Instruction and Evaluation RE: Revised Policy on Immunization for the Bachelor of Nursing Program, College of Nursing

Preamble:

1. The terms of reference for the Senate Committee on Instruction and Evaluation (SCIE) are found on the web at: http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/502.htm
2. At its meeting on March 19, 2015, the Committee considered a proposal from the College of Nursing, to revise its Immunization policy for the Bachelor of Nursing program.

Observations:

1. The College of Nursing is proposing to revise its Immunization policy for the Bachelor of Nursing program, to require that students registered in the program obtain an influenza vaccination each year, and submit documentation of the vaccination by the published deadline. Students who are unable to receive the influenza vaccination for health reasons would be exempt, but would be required to provide supporting documentation from a health care provider by the published deadline.
2. Currently, the College recommends that students obtain the influenza vaccination, but a significant number of students fail to do so. The revised policy would specify that students who did not submit the required documentation by the deadline would not be able to participate in clinical practice courses in the Winter Term.
3. The influenza vaccination is available each fall, normally in October, so it cannot be required for courses that begin in the Fall Term.
4. The objective of the revised policy is to reduce the chances that a student would transmit the influenza virus to vulnerable patients during clinical practice.
5. The revised policy would be in keeping with immunization requirements for students registered in other programs in the Faculty of Health Sciences.
6. It was noted at the meeting that the influenza vaccination is readily available including at influenza vaccination clinics held in the College of Nursing and can also be obtained from public health nurses, pharmacists, nurse practitioners, and physicians.

Recommendation:

The Senate Committee on Instruction and Evaluation recommends:

THAT Senate approve revisions to the Immunization policy for the Bachelor of Nursing program, College of Nursing, effective September 1, 2015.

Respectfully submitted,

Dr. Janice Ristock, Chair
Senate Committee on Instruction and Evaluation

Comments of the Senate Executive Committee:

The Senate Executive Committee endorses the report to Senate.

Faculty of Health Sciences; College of Nursing
Bachelor of Nursing Program
Proposed Revision to Required Immunizations - Mandatory Influenza Vaccination
Effective for Fall Term 2015

An influenza vaccination is required annually of students in the Colleges of Dentistry, Medicine, Pharmacy, and Rehabilitation Sciences in the Faculty of Health Sciences, but it is not currently required by students in the College of Nursing. An influenza vaccination helps to prevent the spread of influenza by healthcare provider students in clinical facilities. The College of Nursing is proposing the following addition to its immunization requirements in order that patient safety is protected and that its requirements are consistent with those of the other colleges.

This policy would be effective Fall 2015 for current and newly-admitted students to the College of Nursing Bachelor of Nursing program.

Recommendation:

All students in Bachelor of Nursing Program are required to obtain an annual influenza vaccination and submit documentation confirming the vaccination by the published deadline.

Students who do not submit documentation of the flu vaccination by the published deadline may not participate in clinical practice courses in Winter Term.

Rationale for Revision:

1. Students are healthcare providers who can transmit diseases to vulnerable patients. The influenza virus can be transmitted before students experience symptoms and know they have the infection.
2. Students in the College of Nursing should meet the same immunization requirements as other Faculty of Health Sciences students, as they are in contact with vulnerable patients during clinical practice.
3. A significant number of students fail to comply with requirements by the deadline. Therefore, a deadline with consequences for non-compliance is necessary.
4. The flu vaccination is available every autumn; therefore, it cannot be required for courses beginning in September.

Procedure:

1. The College of Nursing will set the deadline annually. This deadline will be published on the College website.
2. All students in the Bachelor of Nursing program will be sent notification of the deadline and a copy of the flu vaccination reporting form via the University of Manitoba email.
3. The flu vaccination can be obtained from a public health nurse, pharmacist, nurse practitioner, College of Nursing flu vaccination clinics, or physician. The signature of the health care professional administering the vaccine will be required on the flu vaccination reporting form.
4. Those students who are unable to receive the flu vaccination due to health reasons must submit supporting documentation from their health care provider.
5. Students who do not obtain the flu vaccination and submit the form, or supporting documentation prohibiting the vaccination, by the published deadline will be de-registered from Winter Term clinical practice courses. Students may continue with other courses.

March 19, 2015

Advisors-Undergrad\Policies & Regulations\Mandatory Flu Vaccination –for Senate Executive

Report of the Senate Committee on Instruction and Evaluation RE: Revised Policy on Cardiopulmonary Resuscitation (CPR) Certification for the Baccalaureate Program for Registered Nurses, College of Nursing

Preamble:

1. The terms of reference for the Senate Committee on Instruction and Evaluation (SCIE) are found on the web at: http://umanitoba.ca/admin/governance/governing_documents/governance/sen_committees/502.htm
2. At its meeting on March 19, 2015, the Committee considered a proposal from the College of Nursing, to revise the Cardiopulmonary Resuscitation (CPR) Certification policy for the Baccalaureate Program for Registered Nurses (BPRN program).

Observations:

1. The College of Nursing is proposing to revise the Cardiopulmonary Resuscitation (CPR) Certification policy for the Baccalaureate Program for Registered Nurses (BPRN program), to require that students' CPR certification, at the Health Care Provider Level, be current to the end of the following Winter Term (i.e. April). Returning students whose CPR certification would expire before April of the next academic year would be required to recertify and submit proof of their certification by the published deadline. Normally that deadline would be June 1. Students who would complete a clinical practice course in the summer term would be required to submit proof of their certification by April 15. Students who did not meet the requirements by the appropriate deadline would be put on hold, which would prevent them from registering for courses.
2. The current policy stipulates that registered nurses are to maintain current certification at the required level, but many students fail to comply. This results in additional administrative work on the part of student services staff in the College and the Associate Dean, who must ensure that this requirement has been met before students attend a clinical agency as part of their clinical course work.
3. Students are required by the Winnipeg Regional Health Authority (WRHA) to have current CPR certification in order to attend a clinical agency. The revised policy would ensure that all returning BPRN students would meet this requirement before registering for any courses, including clinical courses.
4. The revised policy for the BPRN program is consistent with the existing CPR Certification policy for the Bachelor of Nursing program and with the requirements for CPR certification in the proposed policy on Non-academic Requirements for Graduate Nursing Programs endorsed by SCIE at the same meeting.

Recommendation:

The Senate Committee on Instruction and Evaluation recommends:

THAT Senate approve the Report of the Senate Committee on Instruction and Evaluation concerning revisions to the Cardiopulmonary Resuscitation (CPR) Certification policy for the Baccalaureate Nursing Program for Registered Nurses, College of Nursing, effective June 1, 2015.

Respectfully submitted,

Dr. Janice Ristock, Chair
Senate Committee on Instruction and Evaluation

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

**University of Manitoba – College of Nursing
Baccalaureate Program for Registered Nurses
Cardiopulmonary Resuscitation (CPR) Certification
Effective June 2015**

Students in the College of Nursing are required by the Winnipeg Regional Health Authority (WRHA) to have current CPR certification in order to attend a clinical agency. Students in the Bachelor of Nursing program and the graduate nursing programs are required to submit, upon admission, proof of CPR certification that is current to the end of the upcoming Winter Term, and updated CPR certification by June 1 in subsequent years as required in order that CPR is current throughout each Fall and Winter term. Students in the Baccalaureate Program for Registered Nurses (BPRN) are required to submit CPR upon admission only. In order to ensure that the BPRN students also have current CPR certification to attend clinical agencies as required for their Nursing courses, the following policy is recommended:

Policy Recommendation:

CPR certification at the Health Care Provider Level must be current to the end of the following Winter Term (i.e., April). Returning students whose CPR expires prior to April of the next academic year will be required to recertify and submit proof of certification by the published deadline. All students taking a clinical practice course in the summer term will be required to submit their CPR by April 15. Students who fail to submit their CPR as required will be placed on hold, thus prohibiting registration for courses or starting classes.

Rationale:

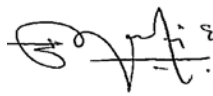
1. A significant number of students fail to comply with the requirements, creating unnecessary work by student services staff and the Associate Dean, who must follow up with students who do not meet the requirements.
2. It is difficult to track when students would take a course that would require them to attend a clinical agency. This policy would ensure that all of the BPRN students would meet the CPR requirements before registering for courses.
3. Students may be asked to leave a clinical agency if they do not meet the CPR requirements. Ensuring that students meet the CPR requirements before registering will prevent students from being interrupted in their course.
4. This policy ensures consistency with CPR requirements in all programs at the College of Nursing.

OFFICE OF THE
VICE-PRESIDENT (RESEARCH
AND INTERNATIONAL)

207 Administration Building
Winnipeg, MB R3T 2N2
Telephone: (204) 474-6915
Fax: (204) 474-7568
www.umanitoba.ca/research

MEMORANDUM

TO: Mr. Jeff Leclerc, University Secretary

FROM: Digvir Jayas, Vice-President (Research and International)
and Chair, Senate Committee on University Research 

DATE: April 14, 2015

SUBJECT: Periodic Review of Research Centres and Institutes: University of Manitoba
Transport Institute

According to the Policy on *Research Centres, Institutes, and Groups*, research centres and institutes will undergo reviews approximately every five years. The University of Manitoba Transport Institute has requested an extension for the review of the Institute.

The Senate Committee on University Research, at its March 12, 2015 meeting, moved to recommend the Institute be granted an additional 6-month extension of the term end date. New term end date is December 31, 2015.

Please include this recommendation on the next Senate agenda. Please feel free to contact me should you require any further information.

Thank you.

Thank you.

DSJ/nis

Cc: Michael Benarroch, Dean, I.H. Asper School of Business

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