MEMORANDUM

TO: **Ms Karen Roche**
Secretary of Senate

FROM: **Dr. Rhonda Koster**
Chair, Senate Undergraduate Studies Committee

SUBJECT: **Report of Senate Undergraduate Studies Committee**

DATE: **17 February 2010**

A. CALENDAR CHANGES REFERRED FROM SENATE MEETING #2009-7 OF OCTOBER 2, 2009

1. FACULTY OF FORESTRY AND THE FOREST ENVIRONMENT

(a) New Degree and revision of an existing degree Part 1-a, Part 1-b and Part II

The Senate Undergraduate Studies Committee met on January 22 and February 5 and 12, 2010 to review the calendar entry for the proposed new Honours Bachelor of Environmental Management and extensive revisions to the Honours Bachelor of Science in Forestry, as well as all associated admission and course changes, including a revised Co-op Option. The Committee recommends approval of the calendar entry as revised in Attachment #1.

A transition option, not part of the original proposal, but integral to the admission to the new and revised programs, is still under review.

B. CALENDAR CHANGES REFERRED FROM SENATE MEETING #2009-9 OF DECEMBER 4, 2009

1. DEPARTMENT OF INTERDISCIPLINARY STUDIES

(a) New Program in Environmental Sustainability

The Committee met on January 29 and February 12, 2010 to review the calendar entry for the proposed new HBASc in Environmental Sustainability, including Co-op Option and associated new Inquiry courses. The Committee recommends approval of the proposal with revisions in Attachment #2.

C. CALENDAR CHANGES REFERRED FROM SENATE MEETING #2010-1 OF JANUARY 29, 2010

The Senate Undergraduate Studies Committee met on February 5 and 12, 2010, to review the calendar change items referred from Senate meeting #2010-1 of January 29, 2010 and makes the following recommendations:

1. FACULTY OF HEALTH AND BEHAVIOURAL SCIENCES

(a) Psychology 4531 – Name change and course description
The Committee recommends that the revised title and course description be approved.

(b) Kinesiology – Updates to Regulations
The Committee recommends that items 1 and 5 of the proposal be approved. Items 2, 3, and 4 have been referred to the Senate Academic Committee for action.

(c) Kinesiology – Co-op and Course Descriptions
The Committee recommends that Senate approve the Kinesiology course change proposal, with revisions and with the exception of item 8 (Kinesiology 3030) that is being withdrawn and item 9 (Kinesiology 3610) that is being deferred for further clarification. The first sentence of item 4, Kinesiology 1710 should use "bio-psycho-social" instead of the capitalized words. The comma should be removed from the title of Kinesiology 1711 in item 5. The capital "I" should be removed from the word "issues" in the description of Kinesiology 2059 in item 7. The course description of Kinesiology 4059 in item 10 should begin "The focus is on". The course description of Kinesiology 4179 in item 11 should begin "Special topics may be offered". In the note below Kinesiology 4220 in item 13, the "and" should be replaced with "or" in the first sentence and the word "cumulative" should be replaced with "overall". In the Note below Kinesiology 4230, item 14, the second sentence should be "Enrolment is limited in each section." In item 16, Kinesiology 4610, the capital letters should be replaced with lower case for the words "diabetes, obesity, cardiovascular disease and cancer". In item 17, the final sentence of the note below Kinesiology 4712 should be replaced with "A minimum 75% overall Kinesiology average is required to register in this course." In item 18, there is no change in the course description for Kinesiology 4713; however, the sentence starting "After initial registration..." should be moved to the Notes. In the Notes below Kinesiology 4713, the word "current" should be added before the "police criminal reference check" and the next sentence should be "A minimum of 75% overall Kinesiology average is required to register in this course." In the second sentence of the course description of Kinesiology 4714, item 19, the word "interactive" should be removed.

2. FACULTY OF EDUCATION

(a) EDUC – 3296 requirement notes
The Committee recommends that the proposed restrictive note for Education 3296 be approved.

3. FACULTY OF SOCIAL SCIENCES AND HUMANITIES

(a) History – deletions, additions and changes
The Committee deferred this item.

(b) Indigenous Learning – 1312 & 1314
The Committee deferred this item.

(c) Northern Studies – Prerequisites 3112, 3212, 3312
The Committee recommends approval of the proposed prerequisite changes.

OUTSTANDING ITEMS

In addition to the items noted above (History, Indigenous Learning, Kinesiology Co-op and Course Descriptions, item 9), the following items remain outstanding:

Calendar Changes Referred from Senate Meeting #2009-5 of May 15, 2009
Faculty of Science and Environmental Studies
BA and BSc programs – non 4-year programs

Calendar Changes Referred from Senate Meeting #2009-7 of October 2, 2009
Faculty of Forestry and the Forest Environment
-New Degree and revision of an existing degree Part 1-a, Part 1-b and Part II – Transition Option (not part of original proposal)

Calendar Changes Referred from Senate Meeting #2009-8 of November 6, 2009
Faculty of Science and Environmental Studies
- Anthropology – Adjustments
- Anthropology – A3150
- Economics – Honours BSc in Resource and Environmental Economics

Dr. Rhonda Koster, Chair

RK/ma

ATTACHMENT #1 – EDITORIAL REVISIONS TO FORESTRY PROPOSAL

ADMISSION REQUIREMENTS:
The Admission Requirements for the Honours Bachelor of Environmental Management and the revised Honours Bachelor of Science in Forestry are the same as currently published for the HBScF:

- 1 credit in Gr. 12 U English; 3 credits from: Gr. 12 U Biology, Gr. 12 U Chemistry, Gr. 12 U or M Geography*, Gr. 12 M Computer & Info Science, Gr. 12 U Advanced Functions, Gr. 12 U Calculus & Vectors, Gr. 12 U Math of Data Management, Gr. 12 U Physics; plus 2 additional Gr. 12 U or M credits
*Only one Gr. 12 U or M geography course may be used.

OLD PROGRAMS:
The current HBES and BES programs will be discontinued and phased out of the Calendar as currently-enrolled students complete their programs.

NEW AND REVISED PROGRAMS:
The program descriptions will appear as follows:

1. Honours Bachelor of Environmental Management

Four Year program
All students will take the common first and second years, then continue in one of the three specializations for the third and fourth years.

First Year:

(a) Forestry 0190 (non-credit required course)

(b) Forestry 1094

(c) Forestry 1010, 1110, 1330

(d) Biology 1110, 1130

(e) Chemistry 1050 or 1110

(f) Economics 2014

(g) Geography 1120

(h) Geology 1131

Non-Academic requirement:

Forestry 0990 – First Aid Certificate

Second Year:

(a) Forestry 0290 (non-credit required course)

(b) Forestry 2094

(c) Forestry 2051, 2055, 2110, 2150, 2210, 2270, 2350

(d) Biology 2050, 2210

(e) Philosophy 2013

(a) Specialization in Wildlife Conservation and Management

Third Year:

(a) Forestry 0390 (non –credit required course)

(b) Forestry 3094

(c) Forestry 2050, 2054, 3116, 3218

(d) Forestry 3212 or 4217

(e) Forestry 3219 or Biology 3151

(f) Geography 2251

(g) Two half-course electives (see Note below)

(h) One half-course open elective

Fourth Year:

(a) Forestry 4094

(b) Forestry 4212, 4214, 4250, 4251

(c) Forestry 4010, 4030

(d) One half-course elective (see Note below)

(e) One and one-half FCE open electives

Note:

Students in the Wildlife Conservation and Management Specialization will choose the 1.5 FCE restricted electives in third and fourth years as follows:

(a) Two half-courses from: Biology 4211, 4231, 4435
(b) One half-course from: Biology 3219, 3250, 3251, 3671, 4111, 4212, 4431; Forestry 3217; Psychology 3511, 3531

(b) Specialization in Conservation Planning and Management

Third Year:

(a) Forestry 0390 (non –credit required course)

(b) Forestry 3094

(c) Forestry 2054, 3135, 3xxx???, 3212, 4217

(d) Biology 3151, 4430

(e) Geography 2251, 2331

(f) One FCE open electives

Fourth Year:

(a) Forestry 4094

(b) Forestry 4212, 4213, 4214, 4250

(c) Forestry 4010, 4030

(d) Geography 2351, 4211, or 4431

(e) Political Science 3711 or 3713

(f) One FCE open electives

(c) Directed Learning Option

Third Year:

(a) Forestry 0390 (non –credit required course)

(b) Forestry 3094

(c) Forestry 2054, 3251

(d) Outdoor Recreation 3290

(e) Political Science 2212 or 2213

(e) Three FCE electives (see Note below)

Fourth Year:

(a) Forestry 4094

(b) Forestry 4212, 4213, 4214, 4250

(c) Forestry 4010, 4030

(d) Two FCE electives (see Note below)

Note:

Students in the Directed Learning Option must choose their 5 FCE electives in third and fourth years as follows:

(a) One FCE at the second year level or higher in Arts

(b) Three FCEs at the second year level or higher in Forestry or Science; however, Forestry courses must be selected from those required courses within other specializations

(c) One FCE open electives

2. Honours Bachelor of Science in Forestry

Four Year program
All students will take the common first and second years, then continue in one of the three specializations for the third and fourth years.

First Year:

(a) Forestry 0190 (non-credit required course)

(b) Forestry 1094

(c) Forestry 1010, 1110, 1330

(d) Biology 1110, 1130

(e) Chemistry 1050 or 1110

(f) Economics 2014

(g) Geography 1120

(h) Geology 1131

Non-Academic requirement:

Forestry 0990 – First Aid Certificate

Second Year:

(a) Forestry 0290 (non-credit required course)

(b) Forestry 2094

(c) Forestry 2051, 2055, 2110, 2150, 2210, 2270, 2350

(d) Biology 2050, 2210

(e) Philosophy 2013

(a) Specialization in Forest Management

Third Year:

(a) Forestry 0390 (non –credit required course)

(b) Forestry 3094

(c) Forestry 2054, 2170, 2330, 3178, 3211, 3212, 3214, 3215, 3218, 3219

Fourth Year:

(a) Forestry 4094

(b) Forestry 3131, 3251, 4212, 4213, 4214

(c) Forestry 4010, 4030

(d) One FCE electives (see Note below)

(e) One half-course open elective

Note:

Students in the Forest Management Specialization will choose the one FCE restricted electives from: Forestry 2310, 3116, 3234, 4217, 4230, 439, 4250, 4259, 4277; Geography 2331, 2351, 4411, 4431

(b) Specialization in Forest Health and Protection

Third Year:

(a) Forestry 0390 (non –credit required course)

(b) Forestry 3094

(c) Forestry 2054, 2170, 2330, 2370, 3xxx [???], 3212, 3213, 3217, 3218, 3219

(d) Geology 4137

Fourth Year:

(a) Forestry 4094

(b) Forestry 3131, 3251, 4212, 4213, 4214, 4239, 4250

(c) Forestry 4010, 4030

(d) One half-course open elective

(c) Specialization in Wood Science

Third Year:

(a) Forestry 0390 (non –credit required course)

(b) Forestry 3094

(c) Forestry 2054, 2170, 2330, 3178, 3211, 3212, 3215, 3218

(d) One FCE electives (see Note below)

Fourth Year:

(a) Forestry 4094

(b) Forestry 3251, 4212, 4213, 4214, 4218, 4271

(c) Forestry 4010, 4030

(d) One FCE electives (see Note below)

Note:

In consultation with the Department, students in the Specialization in Wood Science must choose their 2 FCE electives in third and fourth years as follows:

(a) One FCE in Wood Science chosen from: Forestry 4239, 4259, 4273, 4276

(b) One half-course in Chemical Engineering chosen from: Engineering 1233, 1234, or 1535 Forestry students will need to have completed Grade 12 U Physics before taking Engineering 1233, except with permission of the instructor and Chair.

(c) One half-course in International Trade and Marketing chosen from: Business 2514, 3215, 3235; Forestry 4274, 4275

Co-operative Education Option

Students in both programs and all streams may pursue their degree in a Co-operative Education format. Work term experiences gained through the HBScF or HBEM Co-op program will provide a strong foundation for future career opportunities and contribute substantially to the student's financial situation.

Minimum Admission Requirements - Applicants who meet the minimum academic admission requirements indicated below, will be reviewed by the Faculty Admissions Committee for final admission to the program.

- HBScF or HBEM students who have completed Year 1 or Year 2 of their program
- HBScF or HBEM students who have achieved a minimum of 65% cumulative overall average
- Total **enrollment in the program is limited** and the number of students admitted is based in part on projected co-op employment opportunities.
- Students interested in pursuing the Co-op Option must apply through Career and Co-operative Education Services. Students **must complete all application requirements by November 30th** of either Year 1 or Year 2 of the HBScF or HBEM program.

Admission decisions will be made by **January 21st** of the winter term **preceding** the first summer work term. For further information related to the Application Process, students should review the Co-operative Education Programs in the Admission Requirements section of this Calendar.

Once admitted, HBScF or HBEM Co-op students are required to **complete all academic requirements** outlined for their respective four year program **plus** at least four work terms.

Continuation in the Co-op Option will be contingent on maintaining an overall average of 65% in each term. A Co-op student who obtains less than a 65% average for the course work of any term or who fails any course may be placed on probation for the following academic term. A student who does not remove the probationary standing within the designated term will be dismissed from the Co-op Option. A Co-op student who fails the year (see appropriate academic regulations) will be dismissed from the Co-op Option. Work term credits are not applicable towards the completion of the regular HBSc F or HBEM degree.

Students in the Co-op Option are not guaranteed work term positions. Placements are posted in the Employment and Co-operative Education Centre; students must apply. Employers make decisions on a competitive basis.

Program Structure - Co-op students must complete a minimum of 4 work terms including two spring/summers, one fall and one winter (i.e. 16 months of appropriate work experience). The recommended schedule is shown below:

Year 1 – regular Fall and Winter courses (Terms 1 and 2) plus spring/summer work term (FORE1990)
Year 2 – regular Fall and Winter courses (Terms 3 and 4) plus spring/summer work term (FORE2990)

Year 3 – Fall work term (FORE3990) and Winter work term (FORE4990)
Year 4 – regular Fall and Winter courses (Terms 5 and 6); spring/summer work term (FORE 4993) optional
Year 5 - regular Fall and Winter courses (Terms 7 and 8)

COURSES

Forestry 1990 – First Work Term
No changes

Forestry 2990 – Second Work Term
No changes

Forestry 3990 – Third Work Term
No changes

Delete Forestry 3992 – Fourth Work Term

Forestry 4990 – Fourth Work Term
No changes

Add new course Forestry 4993 – Optional Work Term
Credit Weight: 0.5
For course description see Forestry 1990. An optional (not required) work term during the summer between the Fourth and Fifth Years of the HBScF (Co-op) and HBEM (Co-op) programs. Students taking this program are expected to complete the required co-op placements, Forestry 1990, 2990, 3990 and **4990**.

Delete Forestry 4992 – Sixth Work Term

COURSES:

Add New Courses:
Forestry 2051 – Forest Genetics
Forestry 2055 – Forest Disturbances
Forestry 3135 – Restoration Ecology
Forestry 4010 – Thesis I
Forestry 4030 – Thesis II
Forestry 4271 – Marketing of Forest Products
Forestry 4273 – Property Testing of Forest/Wood Products
Forestry 4274 – Bio-products and the Economy
Forestry 4275 – International Trade of Forest Products
Forestry 4276 – Portable Milling

Delete Courses:
Forestry 3232 – Forest Soils II
Forestry 3237 – Advanced Forest Ecology
Forestry 4020 – Undergraduate Thesis HBScF
Forestry 4040 – Undergraduate Thesis HBES
Forestry 4254 – Advanced Forest Pathology
Forestry 4256 – Forest Soils III
Forestry 4277 – Sustainably Managed Forests

Revisions to Existing Courses:
(a) Revise titles for Forestry 1010, 2110/Biol 2110, 2150, 2270, 2350, 2054/Indi 2054, 3178, 3211, 3215 4213
(b) Revise hours of instruction for Forestry 2210/Enst 2211
(c) Revise titles and hours of instruction for Forestry 1110, 1330, 4218
(d) Revise titles and course descriptions for Forestry 1071, 2050/Biol 2051, 4212, 4214
(e) Revise titles and delete prerequisites for Forestry 3131
(f) Revise titles and prerequisites for Forestry 3218
(g) Revise hours of instruction and perquisites for Forestry 2170
(h) Delete asterisk that indicates an elective course for Forestry 4217 and revise title

Forestry 1010
Canadian Forest Plant Species
2-3; 0-0
An introduction to the identification of trees of Canada including important introduced species. Lab instruction builds upon field school experience and emphasizes identification, classification, site requirements and uses of important species. Lecture instruction emphasizes relevant conifer and hardwood morphology, taxonomy, Canadian forest vegetation and elementary ecological concepts. Scientific names and terminology are used in lectures, laboratory work and examinations. Each student is required to complete a plant collection and to pass an outdoor tree identification test.

Forestry 1071
Economics and Business
0-0; 3-0
An introductory course including the following: statement of the economic problem, theory of the firm, theory of demand, operation of markets and determination of prices.

Forestry 1110
Natural Resources Inventory I
2-3; 0-0
General principles of measurement; theory and use of mensurational instruments; measurement of length, area and volume; construction of standard and local volume tables; estimation of stand volume from simple sampling designs; measurement of non timber resources.

Forestry 1330
Natural Resources Biometrics I
0-0; 3-3
Applications of microcomputer spreadsheets and software for data management and statistical analysis in environmental and forest resources analysis will be introduced. Included in this course are the use of electronic data capturing devices, graphics, spatial distributions, intervals, frequency distributions, measures of central tendency and dispersion, sampling techniques, regression and correlation as they apply to forest conservation and resources.

Forestry 2050/Biology 2051
Dendrology II: Flowering Plant Taxonomy
0-0; 2-3
An introduction to the evolutionary relationships among the flowering plants and the processes that gave rise to their existing taxonomic hierarchy. The systematic identification of Ontario's major flowering plant families is learned in labs. The methods, rules and history of flowering plant taxonomy are presented in lectures. An individual herbarium project is also completed.

Forestry 2051
Forest Genetics
2-3; 0-0
An introduction to the principles of genetics and natural variation of forests. The basic principles and processes of Mendelian, molecular, population and quantitative genetics. The causes and sources of natural variation in forest tree species. The fundamentals of tree improvement and the responsibilities for genetic conservation are stressed.

Forestry 2054/Indigenous Learning 2054
Aboriginal Peoples and Natural Resources
2-3; 0-0
An overview of Aboriginal Peoples and Forestry. Sustainable forest management includes the recognition and protection of aboriginal and treaty rights and a commitment to increase Aboriginal participation in the forest sector. Topics covered include: historical and modern-day treaties and their impacts on forest management; what it means to incorporate Aboriginal and treaty rights in forest management; Aboriginal Peoples' relationship to forest land and resources, policy developments and practices related to Aboriginal forest issues at international, national, regional and local levels, Aboriginal/non-Aboriginal relationships including governments, the forest industry and forest-dependent communities.

Forestry 2055
Forest Disturbances
0-0; 3-0
An introduction to major agents of disturbance in forest: insects, fire and pathogens. Students are expected to understand the conditions that create a disturbance, as well as how disturbances fit into a cycle, how species are adapted to disturbance, and how disturbance relates to biodiversity.

Forestry 2110/Biology 2110
Forest Soils and Water I
2-3; 0-0
An introductory course dealing with soil development, soil description and soil classification. Physical, chemical and biological properties of soils. Site quality and forest soil properties are assessed using routine field and laboratory methods.

Forestry 2150
Natural Resources Biometrics II
0-0; 3-3
Prerequisite: Forestry 1330
The design and analysis of forestry experiments including CRD, RCBD, split-plot and nested (or hierarchical) design structures along with one-way and factorial treatment structures. Data analysis topics include the analysis of residuals, data re-expression, the analysis of means and an introduction to regression analysis.

Forestry 2170
Forest Economics
3-0; 0-0
Prerequisite: Forestry 1071or permission of the instructor
Introduction to the economics of production, distribution and consumption of goods and services produced by, and dependent on, the forest resource. Course objectives are to appreciate the management of forests as an economic activity; to apply some of the concepts and tools of economic analysis to the management of forest resources; and to analyze and critically appraise important forest policy issues from an economic perspective.

Forestry 2210/Environmental Studies 2211
Forest Ecology and Silvics
0-0; 2-3
An introduction to the concepts of structure and function in a forest context. Principles of 1) production ecology, 2) biogeochemical cycling in forest systems, 3) community dynamics and succession and 4) ecosystem ecology will be explored. Impacts of human-induced and natural disturbance events will be discussed. The laboratory portion will emphasize the scientific approach to investigation including literature reviews, collection of data, application of statistical tests and interpretation of results.

Forestry 2270
Photogrammetry/Remote Sensing
2-3; 0-0
An introductory course in the theory and use of photogrammetry and aerial photography principles, techniques and analysis as applied to forest and related data acquisition. Field and laboratory work will culminate in an aerial photo forest typing project.

Forestry 2350
GIS in Management Planning
0-0; 2-3
A study in the utility of operational remote sensing and geographic information systems standards and procedures. The emphasis of the course is to provide the student with an understanding of the transition from interpreted aerial photographs and classified digital satellite imagery to a digital database, and its utilization within a GIS for forest resource management. Forestry applications include forest resource inventory mapping and analysis, terrain analysis, depletion mapping, as well as disease detection and monitoring.

Forestry 3131
Tree Improvement and Conservation
2-3; 0-0
An introduction to genetic principles and their application in forestry practice. Background areas of Mendelian, population and quantitative genetics are covered, as well as the causes and sources of genetic variation in forest trees. The fundamentals of tree improvement are covered including assessment of geographic variation, plus-tree selection, progeny testing, seed orchards, tree breeding, gene conservation and economic justification.

Forestry 3135
Restoration Ecology
3-0; 0-0
An introduction to the theory and practice of restoration ecology. The major topics covered in this course include: the integration of ecological theory and restoration, challenges and methods of restoring populations and communities, restoration of ecological functions, and statistical issues and study design in ecological restoration.

Forestry 3178
Wood Science
0-0; 2-3
Principles of tree growth and wood formation through to wood identification, manufacturing and end uses of forest products. Topics covered include: tree growth and wood formation; cell wall formation and structure; comparative anatomy and ultrastructure of wood and bark; macro and microscopic features of wood; wood quality; variability in wood within and between species; identification methods for softwood and hardwood timbers; physical, mechanical and chemical properties of wood; principles of manufacturing lumber, wood based panels, wood composites and pulp and paper.

Forestry 3211
Forest Operations
2-3; 0-0
The study of methods, systems and organizations employed in the harvesting of wood, and the actual planning of harvesting operations. The layout and planning of forest roads, as well as the secondary transport of wood are also dealt with in detail. Emphasis will be placed on harvesting in the boreal forest. The Occupational Health and Safety Act, and legislation related to harvesting operations will also be reviewed.

Forestry 3215
Forest Succession
0-0; 2-3
Fundamental principles and detailed concepts of even- and uneven-aged forest management are dealt with by this course. Forest management models will be studied to determine their capabilities as analytical tools for forest regulation purposes. Both classical and modern methods of forest regulation and scheduling will be examined. Inter-relationships between the regulation of the forest, growth and yield models, geographic information systems will be studied.

Forestry 3218
Natural Resources Inventory II
2-3; 0-0
Prerequisites: Biology 2050, Forestry 1110 and 2210
Topics include: sampling designs, inventory planning and execution, non-probability sampling, forest growth and yield including individual trees and stands as dynamic biological systems, stem analysis procedures, measures of site productivity, early models of growth and yield, application of applied projection models. Students will participate in field studies and make use of computers in the completion of their laboratory reports.

Forestry 4010
Thesis I
An introduction to the manner in which knowledge is advanced and communicated through research. Lectures cover topics such as the scientific method, hypothesis testing, data collection, data analysis, defining a research topic, and writing a literature review. Students must complete a major literature review.

Forestry 4030
Thesis II
0-0; 0-6
Prerequsite: Forestry 4010
Working under the guidance of a faculty supervisor, students will complete the thesis designed in Thesis I.

Forestry 4212
Management Planning I
2-3; 0-0
Lectures will focus on the principles of planning for the sustainable use of natural resources: such as adaptive management, the planning process, and indicators of sustainability. In labs, students will learn how to analyze questions and alternatives of sustainable resource management using various decision modeling software packages.

Forestry 4213
Policy and Legislation in Natural Resources
2-3; 0-0
This course will consider relationships between forest resource policy and legislation, and an understanding of forest policy and analysis and development. Analysis, development and implementation of policy and legislation for forests and other natural resources are examined. A range of current issues in forest policy, and the institutions and stakeholders involved, will be examined.

Forestry 4214
Management Planning II
0-0; 2-3
In weekly seminars, students will address a set of assigned questions on an assigned set of peer-reviewed journal articles. The objective is to delve somewhat more deeply into the assumptions underlying the introductory principles covered in FORE 4212. In the labs, teams of 4 students each will produce a management plan to be handed in at the end of term.

Forestry 4217
Remote Sensing Applications
[Delete asterisk beside course number that indicates an elective course and make title change – no other revisions]

Forestry 4218
Advanced Wood Science
0-0; 2-3
Prerequisite: Forestry 3178
A more in-depth knowledge in wood structure and morphology. Variability within and between species, growth defects and the impact of silvicultural treatments on wood quality are studied through lab exercises consisting of physical and mechanical property testing using standard procedures for physical tests and using a Universal Wood Testing Machine to study the mechanical properties of different timbers and engineered products. Also students will be involved in projects aimed to display different aspects of the forest products industry. A term paper reporting all the activities during the course is required.

Forestry 4271
Marketing of Forest Products
3-0; 0-0
An introduction to the basic marketing principles. The course will help students learn the concepts for conducting market research and developing marketing intelligence for the forestry sector. Firm's marketing environment is explored to develop a market cover strategy over a value-added forest product's life cycle.

Forestry 4273
Property Testing of Forest/Wood Products
2-3; 0-0
Prerequisite: Forestry 3178
An in-depth look at international standards testing of forest and wood product anatomic, physical and mechanical properties. Hands-on-labs and term experiments utilize standard state-of-the-art industry testing equipment.

Forestry 4274
Bio-products and the Economy
0-0; 3-0
An overview of the use of renewable biological resources and bioprocesses for more sustainable and eco-efficient manufacturing of goods. The contribution of novel bioproducts and bioprocesses to the economy is explored as a source of diversification for the Canadian forest industry.

Forestry 4275
International Trade of Forest Products
0-0; 3-0
An introduction to the main theories in international trade of forest products. The empirical relevance of international trade theories and their role for increasing the competitiveness of the Canadian forest industry.

Forestry 4276
Portable Milling
Principles and practices in portable wood milling through classes detailing wood structure, wood properties in the tree, variability in wood properties along the length of a tree, growth stresses (recognition and dealing with them), growth and sawing defects and how to use this information to aid in milling. Milling training will include the basis of portable milling, portable mills, production on a mill, sawing techniques, maximizing recovery and custom sawing. Aspects of drying and dealing with wood following milling will also be discussed.

ATTACHMENT #2 – EDITORIAL REVISIONS TO ORILLIA HBASC IN ENVIRONMENTAL SUSTAINABILITY PROPOSAL

In addition to the original proposal, the Department of Interdisciplinary Studies included further revisions to the programs and courses in an Addendum 1 and 2. As well, the Committee made the following revisions. It is also understood that the program and course descriptions will follow the standard calendar format.

ADMISSION REQUIREMENTS

Replace "Science" with "Chemistry" in the recommended Grade 12 U courses.

ACADEMIC REGULATIONS

Add "in a discipline" to the bracketed phrase "(a major comprises a set of 10 FCEs...) in Regulation 5.
In the new Regulation 6, replace 16 FCEs with 15.5 FCEs and remove the word "core".
In the new Regulation 15, the second sentence should be "To graduate with an HBASc disciplinary major, a student must have a minimum overall grade average of 70% in the major." The following sentence should be "To graduate with an HBASc in Environmental Sustainability, a student must have a minimum overall grade average of 70% in the required courses of the program."

CONCURRENT PROGRAMS WITH EDUCATION

Add a sentence that "The HBASc (Environmental Sustainability Major) is not offered concurrently with a Bachelor of Education.

CO-OP EDUCATION OPTION

The introduction will be revised as:

Continuation in the Co-op Option will be contingent on maintaining an overall average of 70% in each term. A Co-op student who obtains less than a 70% average for the course work of any term or who fails any course may be placed on probation for the following academic term. A student who does not remove the probationary standing by the end of the next academic term will be dismissed from the Co-op Option. A Co-op student who fails the year will be dismissed from the Co-op Option. Work term credits are not applicable towards the completion of the non co-op HBASc Environmental Sustainability degree.

Graduation from the Co-operative Option of the HBASc in Environmental Sustainability requires, in addition to all academic requirements, satisfactory completion of Inquiry 1993, 2993,3993, and 4993 (see course descriptions for further details). Students unable to complete all co-op placements will graduate with a non co-op degree.

Students in the Co-op Option are not guaranteed work term positions. Placements are posted in the Employment and Co-operative Education Centre; students must apply. Employers make decisions on a competitive basis.

INTRODUCTORY INFORMATION

The paragraph regarding the Writing Across the Curriculum component of the HBASc (Environmental Sustainability Major), with the exception of the final sentence, will be added to the introductory information in the Calendar and the sentence "This is a writing-intensive course" will be added to the course descriptions of Inquiry 1033, 2033, 3053and 4033.

Addendum 1: Revisions to The 4-year HBASc Curriculum in Environmental Sustainability

Changes appear in yellow and bold

A total of 20 full course equivalents (FCEs) is required for graduation. Students must take 16 FCEs of required courses as stipulated below. A total of 4.0 FCEs (See item 9& 10, program regulations) of elective courses may be chosen from within or outside of the Department (see recommended list of electives). Up to two of these electives may be taken from any faculty.

First Year:

a) Biology 1110 Plant Biology
b) Geography 1120 Environmental Issues: A Geographical Approach
c) Biology 1130 Animal Biology
d) Inquiry1010 Foundations of Inquiry
e) Inquiry 103X Inquiry into Environmental Choices
f) Geology 1130 Crust of the Earth
g) ~~Chemistry1050 Foundations of Chemistry I or CHEM 1110 Modern Chemistry I~~**Math 0210: Quantitative Methods for the Social Scientist**
h) Forestry 1010 Dendrology I: Tree Identification
i) ~~One half course in English at first year level~~ **One half course in Area I (strongly recommended: Indigenous Learning 1314 [formerly 3437]:** Native People and the Issues)

Second Year:

a) Biology 2210 Introductory Ecology
b) Philosophy 2013 Environmental Philosophy
c) Biology 2711 Biology of Microorganisms
d) Geography 2351 Geomorphology or Geog 3313 Introduction to Soil Science
e) Geography 2331 Climatology
f) Forestry 2270 Photogrammetry
g) Forestry / Indigenous Learning 2054 Aboriginal Peoples and the Forest
h) Economics 2212 Environmental Economics

i) Inquiry 203x Inquiry into Environmental Methods
j) ~~One half course in Statistics (Math 0210 (0.5FCE) or Inquiry 205x Environmental Statistics (0.5 FCE)~~ **Chemistry 2610: Northern Environmental Chemistry**

Third Year:

a) Inquiry 301x Environmental Biotechnology
b) Political Science 3332 Environmental Politics
c) Biology 3610 Environmental Biology
d) Inquiry 305X Aquatic Resources Planning and Management
e) Geography 3471 Environmental Assessment and Management
f) Inquiry 303x Inquiry into Environmental Conservation
g) Inquiry 307x Field School in Environmental Sustainability I
h) 1.5 FCEs elective

Fourth Year:

a) Inquiry 4010 Honours Seminar
b) Biology 4710 Limnology
c) Biology 4711 Applied & Environmental Microbiology
d) Inquiry 403x Honours research in Environmental Sustainability
e) Inquiry 401X Field School in Environmental Sustainability II
f) 2.5 FCEs elective

Admission Requirements

See Requirements for Admission to Undergraduate Degree Programs in the Admission Requirements and Registration section of this Calendar, page 27. Requirements: Grade 12U English and 5 additional Grade 12U or M courses. At least one Grade 12U Science, Biology, Geography or Mathematics credit is recommended.

Academic Regulations

A student may enter, proceed in, and graduate from the HBASc program in accordance with stipulations outlined in the University Regulations.

Co-op Education Option

The program is currently being developed in consultation with the Career & Co-operative Education Services of Lakehead University. The suggested model for the Co-op option is as follows:

- Required work terms in ~~May of year 2, January of year 3, May of year 3, May of year 4~~ **summer of year 2, summer of year 3, fall of year 4, winter of year 5 .**
- Optional work term in ~~winter of year 5~~ **summer of year 4**
- Each work term is 4 months in duration

Full details of the Co-op Option will be developed over the upcoming term.

a) First Year (Term 1 Fall, Term 2 Winter)

First Year:

(a) Biology 1110

(b) Geography 1120

(c)Biology 1130

(d) Inquiry 1010

(e) Inquiry 103X

(f) Geology 1130

(g) ~~Chemistry 1110 or Chemistry 1050~~ Math 0210: Quantitative Methods for the Social Scientist

(h) Forestry 1010

(i)~~One half course in English at first year level~~ **One half course in Area I (strongly recommended: Indigenous Learning 1314 [formerly 3437]: Native People and the Issues)**

Second Year (Term 3 Fall, Term 4 Winter)

Second Year:

(a) Biology 2210

(b) Philosophy 2013

(c) Biology 2711

(d) Geography 2351 or Geog 3313

(e) Geography 2331

(f) Forestry 2270

(g) Forestry 2054

(h) Economics 2212

(i) Inquiry 203x

(j) ~~One half course in Statistics (Math 0210 (0.5FCE) or Inquiry 205x Environmental Statistics (0.5 FCE)~~ **Chemistry 2610: Northern Environmental Chemistry**

Second Year (Term 5 Summer)
(a) Inquiry 19xx (Co-op)

Third Year (Term 6 Fall)
(a) Inquiry 301x
(b) ~~**Political Science 3332**~~**Inquiry 303x**
(c)Biology 3610
(d) Inquiry 305X
(e) Inquiry 4010

Third Year (Term 7 Winter)
No longer work term
~~**(b) Inquiry 39xx (Co-op)**~~

(a) ~~**Inquiry 303x**~~ **Political Science 3332**
(b) Inquiry 307x
(c) 1.5 FCEs Elective

Third Year Term 8 Summer)
(a) Inquiry 29xx (Co-op)

Fourth Year (Term 9 Fall)
Now work term
(a)Inquiry 39xx (Co-op)

Fourth Year (Term 10 Winter)
(a) Biology 4711
(b)Inquiry 403x
(c) 1.5 FCE elective

Fourth Year (Term 11 Summer)
(a) ~~Inquiry 49xx (Co-op)~~ **Optional Work Term**

Fifth Year (Term 12 Fall)
(a) Geog 3471
(b)Biology 4710
(c) Inquiry 401X
(d) 1.0 FCEs Elective

Fifth Year ~~(Optional work term:~~ Term 13 Winter)

(a) Inquiry 49xx (Co-op)

Recommended list of Electives (Subject to availability)

~~Technical writing I (Engl 1074)~~ Composition (ENGL 1011)
~~Technical Writing II (Engl 1238)~~ Rhetoric (ENGL 1031)
Environmental History: A Global View (HIST 2010)
Sediments and Sedimentary rocks (Geology 2214)
Geographical Inquiry & Interpretation (Geog 2251)
~~Northern Environmental Chemistry (Ch 2610)~~ Modern Chemistry (CHEM 1110 and 1130)
Plant Ecology (Biology 3114)
Biogeography (Biology 3151)
Environmental Psychology (Psych 3211)
Native People and the Land (INDI / ENST 3435)
Environmental Geology (Geol 3311)
Environmental geomorphology (Geog 3311)
Environmental Climatology (Geog 3331)
Depositional environments (Geol 3410/ ENST 3410)
Resource management (Geog 3411)
Geography of Energy (Geog 3431)
Urban Residential Structure (Geog 3731)
Evolutionary Concepts (Biology 3671)
English special topics (Eng 3911): Environmental Literature
Ecological and Environmental Anthropology (Anthro 4111)
Human Impacts on the Environment (Anthro 4114)
Ecology of disturbed habitats (Biology 4115)
Advances in contemporary ecology (Biology 4117)
Principles of Fishery Management (Biology 4213)
Climatology: Climate Change (Geog 4351)
Climatology: Local and Microclimates (Geog 4371)
Science under scrutiny (Biology 4371)
Wetland Ecology (Biology 4430)
Society, Culture and Nature (Sociology 4507)
Sustainable communities (Geog 4771)

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Addendum 2: Revised new courses for HBASc (Environmental Sustainability) – changes in yellow

1. Inquiry 1033: Inquiry into Environmental choices

Credit Weight: 0.5
Prerequisite: INQU 1010
0-0; 3-0
Description:
Building upon Inquiry 1010, students will apply multidisciplinary strategies to address, in a collaborative setting, complex problems with respect to environmental choices, such as pollution, waste management, and energy efficiency. Special consideration will be given to Aboriginal cultural and ethical perspectives with respect to the land.

2. Inquiry 2033: Inquiry into Environmental methods

Credit Weight: 0.5
Prerequisite: INQU 1033
3-0; or 3-0
Description:
Students will be introduced to theoretical and practical aspects of tools and techniques used in environmental research. Themes include Quality Assurance and Quality Control (QA/QC) procedures and certifications, Geographic Information Systems, basic scientific methods, and tools and techniques used in quantitative as well as qualitative research in the environmental field.

~~**3. Inquiry 205x Environmental Statistics**~~

[deleted since we are using MATH 0210]

~~**Credit Weight: 0.5**~~
~~**3-0; or 3-0**~~
~~**Description:**~~
~~An introduction to statistical methods. Measures of relationship, variability, probability, dispersion, and location will be included as well as standard deviations, normal, t, chi-square and f tests, ANOVA, contingency tables, regression and correlation, parametric and nonparametric statistics. Emphasis will be given to application of statistical methods to analyze environmental data.~~

3. Inquiry 3013: Field School in Environmental Sustainability I

Credit Weight: 0.5
Prerequisite: INQU 2033
3-0; 0-0
Description:
Students will participate in a five to seven day excursion or a series of day excursions to examine ecological, socio - economic and cultural characteristics of the environment. Sites visited will vary depending on the central theme chosen for the course. The field component is followed by a classroom component involving identification and assessment of concepts and issues arising from the field excursion, oral presentations and discussions, and the submission of a research essay.
Notes: A fee is assessed to cover travel and accommodation costs.

4. Inquiry 3033: Aquatic Resources Planning and Management

Credit Weight: 0.5
Prerequisite: INQU 1033
3-0; 0-0
Description:
Students will investigate biological, chemical and physical aspects of aquatic resources and human control systems. Emphasis will be placed on complex management challenges, derived from the interaction between the water cycle and human control agencies. Major themes include water supply, water quality, hydropower, flood control, and Aboriginal issues with respect to water resources. Each theme will be examined across a range of scales, technologies, and ~~societies~~ communities.

5. Inquiry 3053: Inquiry into Environmental Conservation

Credit Weight: 0.5
Prerequisite: INQU 2033
3-0; or 3-0
Description:

Students will be introduced to environmental conservation concepts, theories, issues and strategies. Major themes will include environmental law, ~~and~~ management, and Aboriginal-government relations. Lectures will discuss historical (including traditional Aboriginal perspectives), conceptual, empirical, and experimental approaches to environmental conservation. Oral presentations, written reports and investigative assignments will include case studies as well as the practical application of conservation principles.

6. Inquiry 3073: Environmental Biotechnology

Credit Weight: 0.5
3-0; or 3-0
Prerequisite: BIOL 1130 and BIOL 2711
Description:

Students will investigate current technical, cultural, and ethical issues in environmental biotechnology, including plant biotechnology and genetically modified foods, mammalian cloning, reproductive technologies, gene therapies, drug development and approval processes, implications of cloning to biodiversity and lateral gene flow, and bioremediation using genetically modified organisms.

7. Inquiry 4013: Field School in Environmental Sustainability II

Credit Weight: 0.5
Prerequisite: INQU 3013: Field School I
3-0; 0-0
Description:

Students are required to complete a minimum of three weeks field program. The normal time for this course is during August, after completion of the third year. Location of the project areas may vary from year to year, but, generally regions adjacent to Orillia will be visited. The students will be exposed to a variety of field techniques in interdisciplinary (e.g. biological, geographical and geological) settings and will be required to formalize field observations in reports.

8. Inquiry 4033: Honours Research in Environmental Sustainability

Credit Weight: 0.5
Prerequisite(s): INQU 4010
0-0; 3-0
Description:

Students will carry out the research project proposed (and approved) in Inquiry 4010. Students enrolled in the Environmental Sustainability program are required to select their research proposal appropriately in consultation with the department. Various research clusters will be identified such as Land Management, Water Resources Management, Urbanization, Aboriginal Environmental Concerns, Traditional Ecological Knowledge Systems, Environmental Manipulation, Conservation Biology, Energy, Biodiversity and may vary from year to year. A written report and oral presentation will be required.

9. Inquiry 1913: First Work Term

The student will participate in Pre- and Post-Work Term Preparation sessions and activities as designated by the department. Once placed, the student is responsible for meeting the academic requirements of the work term (e.g. Job Description and Training Plan, Performance Appraisal, Work Term Report).

10. Inquiry 2913: Second Work Term

Prerequisite: INQU 1913

Once placed, the student is responsible for meeting the academic requirements of the work term (e.g. Job Description and Training Plan, Performance Appraisal, Work Term Report).

11. Inquiry 3913: Third Work Term

Prerequisite: INQU 2913

Once placed, the student is responsible for meeting the academic requirements of the work term (e.g. Job Description and Training Plan, Performance Appraisal, Work Term Report).

12. Inquiry 4913: Fourth Work Term

Prerequisite: INQU 3913

Once placed, the student is responsible for meeting the academic requirements of the work term (e.g. Job Description and Training Plan, Performance Appraisal, Work Term Report).

Honours Bachelor of Arts and Science in Environmental Sustainability
(Started September 2010)

	Fall	Winter	Summer
Year 1	1	2	
Year 2	3	4	X
Year 3	5	6	X
Year 4	7	X	
Year 5	X	8	