

Part II

Proposed Calendar Changes

2.1 Proposed Changes in Program Descriptions

We propose that the following program descriptions replace all current program descriptions in the University's Calendar, to commence in September 2010.

1. Honours Bachelor of Environmental Management

1.1 Wildlife Conservation & Management

First Year:

- (a) Forestry 0190**
- (b) Forestry 1094**
- (c) Forestry 1010, 1110, 1330,**
- (d) Biology 1110, 1130**
- (e) Chemistry 1050 or 1110**
- (f) Geology 1131**
- (g) Geography 1120**
- (h) Economics 2014**

Non-Academic requirement:

Forestry 0990 – First Aid Certificate

Second Year:

- (a) Forestry 0290**
- (b) Forestry 2094**
- (c) Forestry 2110, 2150, 2210, 2270, 2350, 2xxx, 2xxx**

(d) Biology 2050, 2210

(e) Philosophy 2013

Third Year:

(a) Forest 0390

(b) Forestry 3094

(c) Forestry 2050, 2054, 3116, 3212 or 4217, 3218, 3219 or Biology 3151,

(d) Geography 2251

(d) Elective* - One FCE elective *

***Restricted to the following courses: Biology 4231, 4435, 4211, 3251; Forestry 2170, 3217; Outdoor Recreation 3290, 3810, 4810; Psychology 3511.**

Fourth Year:

(a) Forestry 4094

(b) Forestry 4xxx, 4020, 4212, 4214, 4250, 4251

(c) One and one half FCE electives *

(d) One half FCE free elective.

*** electives restricted as follows: One FCE in Biology: (4211, 4231, 4435,); One half FCE in Zoology: (Fore-3217, Biol-3251, Psych 3511); One half FCE in Social Sciences: (Fore-2170, Outd 3290, Outd 3810 Outd 4810, GEOG 4211) and One FCE unrestricted elective**

1.2 Conservation Planning and Management

First Year:

(a) Forestry 0190

(b) Forestry 1094

- (c) Forestry 1010, 1110, 1330,**
- (d) Biology 1110, 1130**
- (e) Chemistry 1050 or 1110**
- (f) Geology 1131**
- (g) Geography 1120**
- (h) Economics 2014**

Non-Academic requirement:

Forestry 0990 – First Aid Certificate

Second Year:

- (a) Forestry 0290**
- (b) Forestry 2094**
- (c) Forestry 2110, 2150, 2210, 2270, 2350, 2xxx, 2xxx**
- (d) Biology 2050, 2210**
- (e) Philosophy 2013**

Third Year:

- (a) Forest 0390**
- (b) Forestry 3094**
- (c) Forestry 2054, 3xxx, 3xxx, 3212, 4217**
- (d) Biology 3151, 4430**
- (d) Geography 2231, 2251**
- (e) One FCE electives* .**

Fourth Year:

- (a) Forestry 4094**

(b) Forestry 4xxx, 4020, 4212, 4213, 4214, 4250

(c) Political Science 3711 or 3713

(d) One and a half FCE electives. *

*electives restricted as follows: students must take 1 course from either: Geomorphology (GEOG 2351), Conservation Geography (GEOG 4431) or Water Management (GEOG 4211). The remainder are free electives

1.3 Directed Specialization

First Year:

(a) Forestry 0190

(b) Forestry 1094

(c) Forestry 1010, 1110, 1330,

(d) Biology 1110, 1130

(e) Chemistry 1050 or 1110

(f) Geology 1131

(g) Geography 1120

(h) Economics 2014

Non-Academic requirement:

Forestry 0990 - First Aid Certificate

Second Year:

(a) Forestry 0290

(b) Forestry 2094

(c) Forestry 2110, 2150, 2210, 2270, 2350, 2xxx, 2xxx

(d) Biology 2050, 2210

(e) Philosophy 2013

Third Year:

- (a) Forestry 0390**
- (b) Forestry 3094**
- (c) Forestry 2054**
- (d) Political Science 2213 or 2212**
- (e) One and one half FCE electives**

Fourth Year:

- (a) Forestry 0490**
- (b) Forestry: 4020, 4xxx, 4212, 4213, 4214, 4250**
- (c) Two FCE electives***

Electives consist of 1 One FCE (at year level 2 or higher) in Arts; Three FCE (at year level 2 or higher) in Forestry or Science but Forestry courses must be selected from those offered within the other streams.

One FCE elective not restricted.

2. Honours Bachelor of Science in Forestry

2.1 Forest Management

First Year:

- (a) Forestry 0190**
- (b) Forestry 1094**
- (c) Forestry 1010, 1110, 1330,**
- (d) Biology 1110, 1130**
- (e) Chemistry 1050 or 1110**

- (f) Geology 1131**
- (g) Geography 1120**
- (h) Economics 2014**

Non-Academic requirement:

Forestry 0990 - First Aid Certificate

Second Year:

- (a) Forestry 0290**
- (b) Forestry 2094**
- (c) Forestry 2110, 2150, 2210, 2270, 2350, 2xxx, 2xxx**
- (d) Biology 2050, 2210**
- (e) Philosophy 2013**

Third Year:

- (a) Forestry 0390**
- (b) Forestry 3094**
- (c) Forestry 2054, 2170, 2330, 3178, 3211, 3212, 3214, 3215, 3219**

Fourth Year:

- (a) Forestry 4094**
- (b) Forestry 3251, 4xxx, 4020, 4212, 4213, 4214, 3131**
- (c) One FCE restricted electives**
- (d) One half FCE elective free elective**

1.5 FCE electives restricted to:

Forestry 2310, 3116, 3234, 3237, 4217, 4230, 4239, 4250, 4259, 4277

One half FCE elective not restricted

2.2 Forest Health and Protection

First Year:

(a) Forestry 0190

(b) Forestry 1094

(c) Forestry 1010, 1110, 1330,

(d) Biology 1110, 1130

(e) Chemistry 1050 or 1110

(f) Geology 1131

(g) Geography 1120

(h) Economics 2014

Non-Academic requirement:

Forestry 0990 – First Aid Certificate

Second Year:

(a) Forestry 0290

(b) Forestry 2094

(c) Forestry 2110, 2150, 2210, 2270, 2350, 2xxx, 2xxx

(d) Biology 2050, 2210

(e) Philosophy 2013

Third Year:

(a) Forestry 0390

(b) Forestry 3094

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

(d) Geology 3410 or Geology 4137

Fourth Year:

(a) Forest 0490

(b) Forestry 3131, 3251, 4xxx, 4020, 4212, 4213, 4214, 4239, 4250

(c) One half FCE elective with no restrictions

2.3 Wood Science

First Year:

(a) Forestry 0190

(b) Forestry 1094

(c) Forestry 1010, 1110, 1330,

(d) Biology 1110, 1130

(e) Chemistry 1050 or 1110

(f) Geology 1131

(g) Geography 1120

(h) Economics 2014

Non-Academic requirement:

Forestry 0990 – First Aid Certificate

Second Year:

(a) Forestry 0290

(b) Forestry 2094

(c) Forestry 2110, 2150, 2210, 2270, 2350, 2xxx, 2xxx

(d) Biology 2050, 2210

(e) Philosophy 2013

Third Year:

(a) Forestry 0390

(b) Forestry 3094

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

(d) One FCE restricted electives in consultation with the department (listed at the bottom of the program).

Fourth Year

(a) Forestry 4094

(b) Forestry 3251, 4020, 4xxx, 4212, 4213, 4214, 4218, 4xxx

(c) One FCE restricted electives (as listed below) in consultation with the department.

Restricted Electives:

(a) One FCE from the following electives:

Wood Science:

- Forestry 4xxx (Portable Milling), 4xxx (Property, Quality & Testing of Forest/Wood Products), 4239, 4259

(b) One half FCE in Chemical Engineering (selected under department supervision, where ENG 1233 requires grade 12 U Physics or permission of instructor):

- Engineering 1233 or 1234 or 1535

(c) One half FCE in International Trade and Marketing:

Forestry 4xxx (International Trade of Forest Products in the 21st Century), 4xxx (Bio-products & the Economy), 4259, Business 2514, 3215, 3235.

2.2 Proposed Changes on Course Descriptions

2.2.1 Summary of Changes in Courses to be Offered

In Table 4 (below), the list of courses to be added, dropped, or simply changed in description is presented. Those courses to be changed in description are horizontally adjacent to one another in the Table 4. There are 23 such changes proposed. The course titles and descriptions have been changed to reflect the broadening of subject matter from “forestry” to “natural resources management”.

In addition, 8 new courses are to be offered—3 of which are electives in the Wood Science Specialization.

Finally, 7 courses are to be removed from the calendar entirely.

The 8 new courses are:

- 1. Forestry 2xxx--Forest Disturbances**
- 2. Forestry 3xxx--Restoration Ecology**
- 3. Forestry 4xxx--Thesis I**
- 4. Forestry2xxx—Forest Genetics**
- 5. Forestry 4xxx--International Trade of Forest Products**
- 6. Forestry 4xxx--Bio-products and the Economy**
- 7. Forestry 4xxx--Marketing of Forest Products**

8. Forestry 4xxx--Property Testing of Forest/Wood Products

The 7 courses to be removed from the calendar are:

Course Description Dropped	Courses Description Added
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- 1. Forestry 1050—Contemporary Forest Issues**
- 2. Forestry 3232--Forest Soils II**
- 3. Forestry 4277--Sustainably Managed Forests**
- 4. Forestry 3237--Advanced Forest Ecology**
- 5. Forestry 4040--Undergraduate Thesis HBES**
- 6. Forestry 4254--Advanced Forest Pathology**
- 7. Forestry 4256--Forest Soils III.**

Table 4 (below) is a record of all our intended course changes.

Table 4: Proposed calendar changes for courses.

<p>Forestry 1010 Dendrology I: Tree Identification 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.</p>	<p>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.</p>
<p>Forestry 1050 Contemporary Forest Issues 3-2; 0-0 The course provides students with frameworks for understanding the nature of problems, issues and challenges facing the contemporary forest community. Part 1 - forests as ecosystems. Part II - forest management systems for society's multiple and often conflicting uses. Part III - social, economic, legal and political contexts for forest management.</p>	<p>.</p>

<p>Forestry 1110 Forest Mensuration I 0-0; 2-3</p> <p>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.</p>	<p>Forestry 1110 Natural Resources Inventory I 2-3; 0-0</p> <p>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.</p>
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<p>Forestry 1071 Forestry Business and Equipment 0-0; 3-0</p> <p>The introduction of basic business principles, business plans, equipment costing and replacement, and forest products industry. Also presented are the types, uses and limitations of equipment used in forest harvesting, and the major forest products manufacturing processes and equipment.</p>	<p>Forestry 1071 Economics and Business 0-0; 3-0</p> <p>Statement of the economic problem. Theory of the firm. Theory of demand. Operation of markets and determination of prices.</p> <p>The introduction of basic business principles, business plans, equipment costing and replacement, and forest products industry. Also presented are the types, uses and limitations of equipment used in forest harvesting, and the major forest products manufacturing processes and equipment.</p>
<p>Forestry 1330 Forest Biometrics I: Introduction 3-3; 0-0</p> <p>Applications of microcomputer spreadsheets and software for data management and statistical analysis in environmental and forest resources</p>	<p>Forestry 1330 Natural Resources Biometrics I 0-0; 3-3</p> <p>Applications of microcomputer spreadsheets and software for data management and statistical analysis in environmental and forest resources</p>

<p>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.</p>	<p>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.</p>
<p>Forestry 2110/Biology 2110 Forest Soils 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.</p>	<p>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.</p>
<p>Forestry 2150 Forest Biometrics II: ANOVA 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.</p>	<p>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.</p>
<p>Forestry 2270 Photogrammetry 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.</p>	<p>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.</p>

<p>Forestry 3131 Genetics/Tree Improvement 2-3; 0-0 Prerequisite: Forestry 2150 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.</p>	<p>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.</p>
	<p>Forestry 2xxx 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.</p>
<p>Forestry 2210/<u>Environmental Studies 2211</u> Forest Ecology and Silvics 2-3; 0-0 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</p>	<p>Forestry 2210/<u>Environmental Studies 2211</u> 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-</p>

<p>approach to investigation including literature reviews, collection of data, application of statistical tests and interpretation of results.</p>	<p>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.</p>
<p>Forestry 2350 Geographic Information Systems 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.</p>	<p>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.</p>

	<p>Forestry 2xxx Forest Disturbances 0-0; 3-0 An introduction to major agents of disturbance in forest: insects, fire and pathogens. The objectives of the course are for students to understand the conditions of disturbance, disturbances as part of a cycle, how species are adapted to disturbance and how disturbance relates to biodiversity.</p>
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<p>*Forestry 2050/<u>Biology 2051</u> Dendrology II: Forest Plant Taxonomy 0-0; 2-3</p>	<p>Forestry 2050/Biology 2051 Dendrology II: Flowering Plant</p>
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<p>An introduction to the principles of plant taxonomy. Lab instruction is in the systematic study and identification of major seed plant families of Canada's forests. Lecture instruction emphasizes the history, methods, and rules of plant taxonomy. Evolutionary relationships among the families and the processes that gave rise to these groups are stressed.</p> <p><i>Note: A plant collection is required; contact the instructor for further information.</i></p>	<p>Taxonomy 0-0 2-3</p> <p>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 lab. The methods, rules and history of flowering plant taxonomy are presented in lecture. An individual herbarium project is also completed.</p>
<p><u>Forestry 2054/Indigenous Learning 2054</u> Aboriginal Peoples and the Forest 2-3; 0-0</p> <p>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.</p>	<p><u>Forestry 2054/Indigenous Learning 2054</u> Aboriginal Peoples and Natural Resources 2-3; 0-0</p> <p>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.</p>

<p>Forestry 2170 Forest Economics 0-0; 3-0 Prerequisite: Economics 2014 or 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.</p>	<p>Forestry 2170 Forest Economics 3-0; 0-0 Prerequisite: Forestry 1071 or 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.</p>
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<p>Forestry 3178 Wood Technology/Utilization 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.</p>	<p>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.</p>
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Forestry 3211
Forest Harvesting I
 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 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.

<p>Forestry 3215 Forest Regulation and Scheduling 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.</p>	<p>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.</p>
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<p>Forestry 3218 Forest Mensuration II 2-3; 0-0 Prerequisites: Biology 2050, Computer Science 0412, Forestry 1110, 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.</p>	<p>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.</p>

	<p>Forestry 3xxx</p> <p>Restoration Ecology</p> <p>3-0; 0-0</p> <p>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.</p>
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<p>*Forestry 3232</p> <p>Forest Soils II</p> <p>0-0; 2-3</p> <p>Prerequisite: Forestry 2110 or permission of the instructor</p> <p>An advanced course on forest soils. Emphasis is placed on soil water and soil fertility. Topics covered include soil water, forest hydrology, site degradation, nutrient cycling, soils and silviculture, and effects of fire. Laboratory exercises deal with soil water, soil chemistry, site quality evaluation, and use of soil survey reports.</p> <p><i>To be offered in even-numbered sessions.</i></p>	
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<p>Forestry 4212</p> <p>Forest Management Plan I</p> <p>2-3; 0-0</p> <p>Students will produce a draft plan incorporating the principles of integrated forest resources including relevant practices related to timber, wildlife, recreation and other forest land based resources.</p>	<p>Forestry 4212</p> <p>Management Planning I</p> <p>2-3; 0-0</p> <p>Students will receive lectures on the principles of planning for the sustainable use of natural resources: adaptive management, the planning process, indicators of sustainability, etc. In labs, students will learn how to analyze questions and alternatives of sustainable resource management using various decision modeling software packages.</p>
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<p>Forestry 4213 Forest Policy and Legislation 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.</p>	<p>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.</p>
<p>Forestry 4214 Forest Management Plan II 0-0; 2-3 The draft plan produced in Forest Management Plan I (Forestry 4212) will be modified to produce a final plan. Planning, implementation and control of forestry operations within project, annual and operational time frames will be stressed.</p>	<p>Forestry 4214 Management Planning II 0-0; 2-3 The lecture portion of this course will be conducted as a seminar where 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, students will divide themselves into teams of 4 and produce a management plan to be handed in at the end of term.</p>
<p>*Forestry 4217 Remote Sensing Applications in Forestry 0-0; 2-3 Prerequisite: Forestry 2350 An in-depth lecture-seminar-laboratory course in digital remote sensing. The relationships between tree physiology, vigor, and reflectance are stressed, as well as generalized soil and water spectra. Acquisition technology (passive and active) is covered in detail. Enhancement and classification techniques are taught and evaluated. A thorough understanding of technology limitations to forestry is emphasized. Case studies include multi-temporal and analysis (depletion mapping), vigor assessment, as well as cover-type identification.</p>	<p>Forestry 4217 Remote Sensing Applications in Forestry 0-0; 2-3 Prerequisite: Forestry 2350 An in-depth lecture-seminar-laboratory course in digital remote sensing. The relationships between tree physiology, vigor, and reflectance are stressed, as well as generalized soil and water spectra. Acquisition technology (passive and active) is covered in detail. Enhancement and classification techniques are taught and evaluated. A thorough understanding of technology limitations to forestry is emphasized. Case studies include multi-temporal and analysis (depletion mapping), vigor assessment, as well as cover-type identification.</p>

<p>*Forestry 4218 Advanced Wood Technology 2-3; or 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.</p>	<p>Forestry 4218 Advanced Wood Science 0-0; or 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.</p>
<p>*Forestry 4256 Forest Soils III 2-3; 0-0 Prerequisite: Forestry 2110 or permission of the instructor This course will review various methods for estimating site quality, and the interrelationships among site quality, forest yields and landscape classification. Concepts of tree mineral nutrition and diagnostic techniques will be examined through soil, foliar, and vector analyses. Strategies for soil conservation and site quality enhancement will be discussed through exercises dealing with erosion control, compaction, and fertilization. <i>To be offered in even-numbered sessions.</i></p>	
<p>*Forestry 4277 Sustainably Managed Forests 0-0; 2-3 Prerequisite: Forestry 2330 A focus on the principles of production ecology, nutrient and dynamic characteristics of forest ecosystems and their responses to forest management. Assessment of sustainability of net primary production, site productivity and yield under different management scenarios, soils and climatic regimes using ecosystem-level simulation models.</p>	
	Forestry 4xxx

	<p>Thesis I 3-0; 0-0 An introductory course on how 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.</p>
<p>Forestry 4020 Undergraduate thesis HBScF 0-6;0-6 Under direct supervision of a Faculty member.</p>	<p>Forestry 4xxx Thesis II 0-0; 0-6 Working under the guidance of a faculty supervisor, students will complete the research project designed in Thesis I.</p>

	<p>Forestry 4xxx 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.</p>
	<p>Forestry 4xxx Bio-products and the Economy 0-0; 3-0 An overview of the use of renewable</p>

	<p>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.</p>
	<p>Forestry 4xxx</p> <p>Marketing of Forest Products</p> <p>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.</p>
	<p>Forestry 4xxx</p> <p>Property Testing of Forest/Wood Products</p> <p>2-3; 0-0</p> <p>Prerequisite: Fore-3178</p> <p>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.</p>

<p>Forestry 4040 Undergraduate Thesis HBES</p> <p>Remove entire course and description from calendar.</p>	
<p>Forestry 4254 Advanced Forest Pathology</p> <p>Remove entire course and description from calendar. .</p>	

3.3 Transition Plan

The new programs will be introduced gradually; i.e., one year at a time, thus ensuring that all undergraduate students currently enrolled in all undergraduate programs have the opportunity to graduate from the program in which they are currently enrolled.

Table 5 (below) lists the years in which the older programs, by year, will be taught.

Table 5: Academic years and program-years in which the older undergraduate programs will be offered.

Old Program Year To be Taught	Academic Year			
	2010-2011	2011-2012	2012-2013	2013-2014
	2 nd year			
	3 rd year	3 rd year		
	4 th year	4 th year	4 th year	

Table 6 (below) lists the academic years and program-years in which the new programs will be taught.

Table 6: Academic years and program-years in which the new undergraduate programs will be offered.

Revised Program Year to be Taught	Academic Year			
	2010-2011	2011-2012	2012-2013	2013-2014
	1 st	1 st	1 st	1 st
		2 nd	2 nd	2 nd
			3 rd	3 rd
			4 th	

Hence, there will be no increased teaching load arising from the transition to the revised programs. Should students currently enrolled in a program fail a course which cannot be made up through the revised program, we will ensure that the students be offered an equivalent course in the revised program.