

# Overview of the Forest Ecology and Management Major

University of Northern British Columbia

Beginning in September 2008, the Forestry major at UNBC will be offered in a significantly revised format, which will be characterized by greatly reduced course requirements and greatly increased flexibility in elective options (allowing for a wide range of specialized training). The new major (Forest Ecology and Management) will be mandatory for all incoming students beginning in Fall 2008. Existing "Forestry" majors will have the option to continue under the current program or to integrate into the new system. Depending upon the background education and current status of each student, it may be more beneficial to continue under the current system or to enter the new program.

Following is an overview of the new major requirements. We recommend that all existing Forestry majors acquaint themselves with the new major requirements and benefits as soon as possible. *Additionally, we strongly suggest that all current Forestry students consult with a faculty member or student advisor to assess their status as it relates to the new program.*

## **Rationale for the proposed revisions:**

Since the early 1990s, and particularly since 2000, the forestry profession in Canada has had to adapt to some difficult realities, including changing social expectations and demands about forest management, an expanding scope of responsibilities and requirements for professional foresters not covered in existing curricula, the exclusion of forestry-related specialists from the profession, and declining enrolments in accredited forestry programs across Canada.

Both the forestry profession and forestry educators began to take concrete steps to address these realities in the early part of this decade. Significant progress toward Forestry curriculum reform began with initiation of the "Inclusivity Project" by the Canadian Federation of Professional Forestry Associations (CFPFA) in 2004. The Project resulted in extensive consultations within the profession and with a high level of involvement by academic representatives. The new *Certification Standards for the Profession of Forestry in Canada* (administered by the Canadian Forestry Accreditation Board) was the outcome of this joint effort, which has been adopted by all but one of the provincial professional forestry associations.

UNBC's Forestry program will undergo its next accreditation review in 2009, which will take place under the new standards. As such, major curriculum revisions have been developed to conform with the new academic standards while at the same time emphasizing the unique strengths and expertise of UNBC faculty contributing into the program.

The core competencies of the new certification standards define the essential knowledge and skills that all entrants to the forestry profession must exhibit, and do so in a manner that reduces this core to a considerably smaller proportion of the undergraduate curriculum than at present. In this way, the instructional time freed up will be available for electives that will better meet the

interests of individual students and enable universities to designate new specialization streams (to be offered as minors at UNBC) within the accredited programs. In broad terms, the breakdown of academic credit-hours in the future will consist of approximately ½ devoted to the required core, ¼ for preparatory and supporting courses in the natural and social sciences, and ¼ for electives.

The core competency standards are organized as seven thematic categories:

1. Tree and stand dynamics
2. Forest to landscape, structure and function
3. Forest management
4. Economics and administration of forestry
5. Communication and critical reasoning
6. Information acquisition and analysis
7. Professionalism and ethics

In the development of the new forestry curriculum, the committee sought to balance the new standards requirements, course breadth, foundational requirements and the overall core reduction required in the new curriculum. Following are some key changes to UNBC forestry curriculum that reflect these considerations:

1. To represent the specific strengths of the UNBC Forestry program, we are recommending that the program name be changed to *Forest Ecology and Management*.
2. The revised forestry curriculum expands the role for social sciences and business with the inclusion of COMM 100 and COMM 230.
3. The revised forestry curriculum slightly reduces the basic science core of forestry with the deletion of PHYS 115.
4. The revised forestry curriculum explicitly recognizes natural disturbance processes as an organizing theme in forest science and forest management through creation of a new required course (FSTY 307-3 Disturbance Ecology and FSTY 317-1 Forest Disturbance Agents).
5. The revised forestry curriculum integrates several courses with overlapping content in plant ecology (combining FSTY 206 and FSTY 208 into FSTY 209 Forest Biology and Silvics) and management practices (deletion of FSTY 302 and integration of its required core content into FSTY 305).
6. The revised forestry curriculum utilizes new and existing minor offerings to provide students with a broad selection of specialized training, which reflects the diversity of management issues currently being addressed by forest professionals.

## **Major in Forest Ecology and Management**

Undergraduate students are required to take a total of **96** credit hours of program core courses in addition to a qualified minor as outlined below.

The minimum requirement for completion of a Bachelor of Science with a major in Forest Ecology and Management is **123** credit hours.

### **Program Requirements**

#### **100 Level Requirements:**

BIOL 101-4 Introductory Biology I  
BIOL 102-4 Introductory Biology II  
CHEM 100-3 General Chemistry I  
CHEM 101-3 General Chemistry II  
CHEM 120-1 General Chemistry Lab I  
CHEM 121-1 General Chemistry Lab II  
COMM 100-3 Introduction to Canadian Business  
ECON 100-3 Microeconomics  
MATH 152-3 Calculus for Non-majors  
NREM 100-3 \*Field Skills  
NREM 101-3 Introduction to Natural Resource Management and Conservation  
NRES 100-3 Communications in Natural Resources and Environmental Studies

\*Note: Applications for exemption from NREM 100-3 must be made within the first year of study in any Natural Resource Management major.

#### **200 Level Requirements:**

BIOL 201-3 Ecology  
COMM 230-3 Organizational Behaviour  
ENSC 201-3 Introduction to Atmospheric Science  
FSTY 201-3 Forest Plant Systems  
FSTY 205-3 Introduction to Soil Science  
FSTY 207-1 Ecological Classification  
FSTY 209-4 Forest Biology and Silvics  
GEOG 205-3 Cartography and Geomatics  
or GEOG 300-3 Geographic Information Systems  
GEOG 210-3 Geomorphology  
MATH 240-3 Basic Statistics  
NREM 203-3 Resource Inventories and Measurements

#### **300 Level Requirements:**

FSTY 305-4 Silviculture  
FSTY 307-3 Disturbance Ecology and Forest Health  
FSTY 317-1 Forest Disturbance Agents  
FSTY 310-3 Forest Economics  
or NREM 306 Society, Policy and Administration

NREM 303-3 First Nations' Approaches to Resource Management  
NREM 333-3 Field Applications in Resource Management

**400 Level Requirements:**

FSTY 408-3 Forest Practices and Management  
NREM 400-4 Natural Resources Planning  
NREM 411-3 Environmental and Professional Ethics  
NRES 421-1 Professional Writing and NRES 422-2 Undergraduate Report  
or NRES 430-6 Undergraduate Thesis

**Minor Requirement in Forest Ecology and Management**

*Forest Ecology and Management students are required to complete a minor as part of their degree.* The eligible minors will allow students to gain a solid foundation in numerous specialized areas of forest management. Four minors outlined below (Natural Resources Planning and Operations, Earth Science, Biology and Conservation, and Social Dimensions of Natural Resource Management) have been specifically designed for Forest Ecology and Management students. Select minors offered by other programs have also been identified to provide Forest Ecology and Management students with appropriate options for specialized training. Eligible minors include Environmental Science, Environmental Studies, Environmental Planning, Indigenous People's Knowledge, Forest Recreation, General Business, Geographic Information Systems (GIS) and Global Environmental Change (*see student calendar for specific requirements in each minor*).

## ***Natural Resources Planning and Operations***

The **Natural Resources Planning and Operations** minor is designed for students primarily interested in operations and planning (and their governing policies) related to the management of forested and non-forested lands. Students will learn about natural resource policy, forest-management planning and operations, environmental impacts of management practices, forest productivity and timber supply, and resource sustainability along with current computer-based management tools. It is strongly recommended that students taking this minor have a background in forest ecology and management.

The minor in **Natural Resources Planning and Operations** requires the completion of 18 credit hours, of which 12 credit hours must be at the upper division (i.e., 300 or 400 level). Courses used to fulfill major requirements may not be applied toward the minor in Forest Operations and Planning.

### ***Required Courses:***

NREM 210-4 Integrated Resource Management  
ENVS 326-3 Natural Resources, Environmental Issues, and Public Engagement

***Electives:*** Four from the following (with no more than two in any program)

BIOL 325-3 Ecological Analysis  
BIOL 413-3 Wildlife Management  
ECON 305-3 Environmental Economics  
ECON 330-4 Resource Economics  
ECON 411-3 Cost-Benefit Analysis  
ENPL 204-3 Principles and Practices of Planning  
ENPL 303-3 Spatial Planning with GIS  
ENPL 304-3 Mediation, Negotiation and Public Participation  
ENPL 305-3 Environmental Impact Assessment  
ENPL 410-3 Land Use Planning  
ENPL 411-3 Planning Theory, Process and Implementation  
ENSC 453-3 Environmental Resource Management / Decision Making  
ENVS 325-3 Global Environmental Change: Science and Policy  
FSTY 310-3 Forest Economics  
FSTY 315-3 Forest Soil Management  
FSTY 405-3 Silviculture II  
FSTY 407-3 Forest Products  
GEOG 413-3 Advanced GIS  
NREM 306-3 Society, Policy and Administration  
NREM 410-3 Watershed Management  
NREM 413-3 Agroforestry

## **Earth Science**

The Earth Sciences minor provides depth in areas of earth science that support natural resource management. Students are required to complete 18 credit hours (12 of which must be 300 or 400 level) chosen from the following lists, with at least one course from each of the first three groups. A maximum of two courses (6 credit hours) used to fulfill the requirements for a major, or another minor, may also be used to fulfill requirements for this minor. It is the student's responsibility to ensure that they have the required prerequisites.

### *Hydrology:*

ENSC 202-3 Introduction to Aquatic Systems  
ENSC 451-3 Groundwater Hydrology  
ENSC 454-3 Snow and Ice  
GEOG 310-3 Hydrology *or* NREM 410-3 Watershed Management

### *Geomorphology:*

GEOG 311-3 Concepts in Geomorphology  
GEOG 405-3 Fluvial Geomorphology  
GEOG 411-3 Advanced Elements in Geomorphology  
GEOG 412-3 Geomorphology of Cold Regions  
GEOG 414-3 Weathering Processes

### *Soil Science:*

FSTY 315-3 Forest Soil Management  
FSTY 425-3 Soil Formation and Classification  
FSTY 455-3 Biogeochemical Processes in Soil Systems

### *Other:*

ENSC 425-3 Global Change Science  
GEOG 413-3 Advanced GIS  
GEOG 432-3 Remote Sensing  
GEOG 457-3 Advanced Remote Sensing

## **Biology and Conservation**

The minor in Biology and Conservation will provide students with a background in ecological principles and techniques associated with the management and conservation of animal and plant populations and communities associated with a range of ecosystems. Upon completion of the minor, students will have a broad background in genetics and evolution, population and community dynamics, ecological analysis, and the key problems and approaches for conserving biological diversity.

The minor in Biology and Conservation requires the completion of a minimum of 24 credit hours of study. A maximum of two courses (6 credit hours) used to fulfill the requirements for a major, or another minor, may also be used to fulfill requirements for this minor. It is the student's responsibility to ensure that they have the required prerequisites.

### ***Required Courses***

BIOL 210-3 Genetics  
BIOL 325-3 Ecological Analysis  
BIOL 410-3 Population and Community Ecology  
BIOL 411-3 Conservation Biology

### ***Electives: Five from the following, three of which must be listed as Biology courses:***

NREM 204-3 Introduction to Wildlife and Fisheries  
BIOL 303-3 Plant Physiology  
BIOL 305-3 Plant Morphology and Anatomy  
BIOL 307-3 Ichthyology and Herpetology  
BIOL 308-3 Ornithology and Mammalogy  
BIOL 321-3 Animal Physiology  
BIOL 323-3 Evolutionary Biology  
BIOL 350-3 Ethnobotany  
BIOL 401-3 Plant-Microbial Interactions  
BIOL 402-3 Aquatic Plants  
BIOL 404-3 Plant Ecology  
BIOL 406-3 Fish Ecology  
BIOL 412-3 Wildlife Ecology  
BIOL 440-3 Internship  
ENPL 305-3 Environmental Impact Assessment  
ENVS 325-3 Global Environmental Change  
NREM 413-3 Agroforestry

## **Social Dimensions of Natural Resources Management**

The Minor in Social Dimensions of Natural Resources Management will prepare students to engage the public and First Nations in collaborative processes dealing with the range of values encompassed within the practice of natural resources management. Upon completion of the minor, students will be familiar with planning policy and practice as it applies to natural resources management, the range of values and social considerations that apply to a number of resource sectors, and tools for soliciting and involving multi-stakeholder interests.

The minor in Social Dimensions of Natural Resources Management requires the completion of a minimum of 24 credit hours of study. A maximum of two courses (6 credit hours) used to fulfill the requirements for a major, or another minor, may also be used to fulfill requirements for this minor. It is the student's responsibility to ensure that they have the required prerequisites.

### **Required**

ENPL 401-3 Environmental Law  
ENPL 304-3 Mediation, Negotiation and Public Participation  
or ENVS 301-3 Natural Resources, Environmental Issues, and Public Engagement

One of:

POLS 332-3 Community Development  
POLS 434-3 Resource Communities in Transition

Five of the following:

BIOL 350-3 Ethnobotany  
ENPL 104-3 Introduction to Planning  
ENPL 304-3 Mediation, Negotiation and Public Participation  
ENPL 409-4 Advanced First Nations Community and Environmental Planning  
ENPL 419-3 Social Research Methods  
ENVS 301-3 Natural Resources, Environmental Issues, and Public Engagement  
ENVS 325-3 Global Environmental Change: Science and Policy  
FNST 203-3 Introduction to Traditional Ecological Knowledge  
FNST 304-3 First Nations Environmental Philosophy and Knowledge  
FSTY 440-3 Internship  
GEOG 401-3 Resource Geography  
GEOG 403-3 Aboriginal Geography  
GEOG 424-3 Social Geography of Northern Communities  
HIST 421-3 Wilderness, Parks and Aboriginal Peoples  
NREM 413-3 Agroforestry  
ORTM 200-3 Sustainable Outdoor Recreation and Tourism  
POLS 220-3 Canadian Law and Aboriginal Peoples  
POLS 316-3 Community, Government and Politics  
POLS 332-3 Community Development  
POLS 434-3 Resource Communities in Transition