

# John H. Daniels Faculty of Architecture, Landscape and Design

## University of Toronto

### Graduate Courses in the Forestry Programs

#### INTRODUCTION

Following are descriptions of graduate courses offered by the Faculty of Forestry. Forestry's annual graduate course schedule, available at [www.forestry.utoronto.ca](http://www.forestry.utoronto.ca), provides specific sessional information regarding course availability, timing and location. Instructors should be consulted directly for additional information re: course content, prerequisites and course suitability to a student's program.

#### COURSE DESCRIPTIONS

##### **FOR1001H GRADUATE SEMINAR**

An overview of the current issues facing forest conservation, management and research is presented in guest seminars. Students will improve their writing and presentation skills as well as broaden their appreciation of forest science through written assignments and presentations. Weekly attendance at seminars and a poster presentation during the fall is required along with a written research proposal and seminar workshop the following spring. During the first fall session, the course includes select assignments in conjunction with students from the professional forest conservation program (MFC). This is a required course for all incoming research-stream graduate students (PhD, MScF) and is offered on a C/NCR basis.

Course instructor: Sandy Smith

##### **FOR1270H FOREST BIOMATERIAL SCIENCES: FUNDAMENTALS, APPLICATIONS, AND THE NEXT FRONTIER**

A key course to gain fundamental knowledge focused on forest biomaterial sciences, to have an overview of renewable materials for industrial applications, and to be exposed to leading-edge science and technologies in fields relevant to the application of forest biomaterials. Topics will cover materials science, mechanics, wood chemistry, surface sciences, adhesives, nanotechnology, and advanced analytical characterization. The course consists of seminars, student projects, and presentations according to specific topics that are selected based on student interests or thesis projects.

Course instructor: Not offered 2021-22

##### **FOR1288H DESIGN AND MANUFACTURING OF BIOMATERIALS**

This course focuses on the manufacturing processes, properties and uses of wood and agricultural fibre-based products including wood-based composites, ligno-cellulosic/thermoplastic composites and structural or engineered composites. There will be particular emphasis on the effects of adhesives and additives. Rheological behaviour of wood-furnish mats and visco-elastic behaviour of materials and final products.

Course instructor: Mohini Sain

Exclusion: FOR423H1/FOR424H1

##### **FOR1294H BIOENERGY & BIOREFINERY TECHNOLOGY**

The course focuses on technological advances and approaches in deriving biofuels and chemical feedstocks from forest and other biomass. Fundamental chemical attributes of biomass, as they affect fuel value and potential for deriving liquid, solid, and gaseous fuels from the biomass will be discussed. Processing options for valuable chemicals for other applications will also be discussed. Emphasis will be placed on the economics and processing efficiencies of these conversion technologies.

Course instructor: TBC

Exclusion: FOR410H1/FOR425H1

##### **FOR1412H NATURAL RESOURCE MANAGEMENT 1 FOR1413H NATURAL RESOURCE MANAGEMENT 2**

Directed studies (master's level) course dealing with selected aspects of natural resource management by arrangement between student and individual staff member. A maximum of one directed studies course taken with a student's supervisor can be credited toward meeting departmental degree program requirements.

Course instructor: Staff

**Note:** Prior written agreement of staff member is required to register for course (a "Request for Individual Reading and/or Research Course" form available from Faculty Office).

##### **FOR1416H FOREST FIRE DANGER RATING**

The assessment of forest fire danger is a critical aspect of forest fire management. We will review the physical, mathematical and statistical aspects of models used for forest fire danger rating in Canada, including fuel moisture, fire occurrence and fire behaviour models and will examine how these models have been developed based on field and laboratory experimentation and statistical modelling techniques. Through lectures and assignments, we will examine the assumptions underlying these models and their use and develop an understanding of how to modify or develop new models to fit new forest types or management needs.

Course instructor: Mike Wotton

Exclusion: FOR419H1

##### **FOR1575H URBAN FOREST CONSERVATION**

Course objective: to provide background on the many challenges facing those charged with the responsibility of managing urban forest ecosystems. A major theme will be the need to address these challenges within the context of planning and legislative processes, specifically addressing community engagement and urban forest management planning. Topics: the role of tree and green spaces in urban environments; socio-economic and environmental benefits; stresses acting on trees in the urban environment, and potential remedial measures.

Course instructor: Danijela Puric-Mladenovic

Exclusion: FOR416H1/FOR421H1

##### **FOR1585H URBAN FOREST CONSERVATION FIELD CAMP**

The Urban Forest Conservation Field Camp will consist of five days examining urban forestry issues in the GTA and 5-7 additional days visiting municipalities in southern and eastern Ontario, Quebec as well as the northern USA. Topics will include urban forest inventories, nursery production, arboricultural techniques, urban woodland management, urban forest health, urban forest administration, urban dendrology and urban forestry research.

**Note:** Summer session course/activity.

Course instructor(s): TBC

Exclusion: FOR418

### **JFG1610H SUSTAINABLE FOREST MANAGEMENT AND CERTIFICATION**

The field and practice of sustainable forest management and certification are rapidly evolving. This course is designed to provide an overview of sustainable forest management policies and programs from a provincial, national and international perspective. Through the implementation of policies and programs, various outcomes can be achieved (ecological sustainability, biodiversity conservation, economic stability, community longevity). Historical perspectives, current initiatives and future opportunities are reviewed. The successes achieved through such implementation are measured through the use of criteria and indicators and certification processes. The ISO, SFI, the Canadian Standards Association, the Forest Stewardship Council and other certification processes are studied.

Course Instructor: Ben Kuttner (RPF)

### **FOR1900H ADVANCED TOPICS IN FORESTRY 1 FOR1901H ADVANCED TOPICS IN FORESTRY 2**

A directed studies and/or research course at the advanced (Ph.D.) level by arrangement between student and individual staff member. A maximum of one directed studies course taken with a student's supervisor can be credited toward meeting departmental degree program requirements.

Course instructor: Staff

**Note:** Prior written agreement of staff member is required to register for course (using a "Request for Individual Reading and/or Research Course" form available from Faculty office).

### **FOR3000H CURRENT ISSUES IN FOREST CONSERVATION**

Major approaches and challenges facing effective conservation of the world's forests are addressed through critical analysis of Canadian and international forest management and practices, including global land use conflicts within inhabited and pristine landscapes, aboriginal communities and the forest industry. Guest lectures and professional-based assignments are used to investigate ENGO and governmental perspectives in topical areas including climate change, carbon sequestration, endangered species legislation, value-added wood product technology, and biomolecular advances.

Course instructor: Sandy Smith

### **FOR3001H BIODIVERSITY OF FOREST ORGANISMS**

Introduction to systematics, identification and classification of plants and animals comprising the main taxonomic groups of forest organisms: trees, fungi, bryophytes, lichens, ferns, conifers and other gymnosperms, angiosperms, insects, other arthropods, amphibia, reptiles, birds and mammals. Community ecology, diversity and function in relation to forest management planning are addressed through field trips, lectures & a team-based consultant report. The course is composed of a 8-day field camp at the beginning of term, followed by lectures and field trips covering topics in biodiversity of forested landscapes and ecosystems.

Course instructor: Jay Malcolm

### **FOR3002H APPLIED FOREST ECOLOGY AND SILVICULTURE**

An examination of the natural processes that determine the structure and function of forest ecosystems at the tree, stand and landscape scale, and approaches to integrating ecological theory in forest management practice. Topics include silvics and functional ecology of tree species, forest succession, soils and biogeochemical cycles, stand dynamics, growth and yield modelling, silvicultural systems and forest conservation ecology. The emphasis will be on northern temperate forests with select examples from other regions. Field and laboratory exercises will provide practical experience in forest biometrics and inventory, silvicultural experimental design, stand management prescriptions and the use of forest landscape databases and models.

Course instructor: Sean Thomas

### **FOR3003H ECONOMICS OF FOREST ECOSYSTEMS**

The focus of the course is to build theoretical foundations of economic issues related to forest ecosystems and to develop an understanding of their applications to real life situations of forest conservation. The different economic concepts related to forest ecosystems are taught in a three-step process - theory, practice, and application. First, some basic concepts of economics, such as consumer choice, firm behaviour, and competitive markets are introduced. The second part is organized in five units – one each on welfare theory, rent theory, cost-benefit analysis, forest rotation, and international trade of forest products.

Course instructor: Rasoul Yousefpour

### **FOR3004H FOREST MANAGEMENT DECISION SUPPORT SYSTEMS**

The use of analytical methods and mathematical modelling in the planning for sustainable management of forests and integration of the ecological, economic and social issues related to forest management. Introduction of various decision-making techniques such as linear programming, computer simulation and geographic information systems.

Course instructor: David Martell

### **FOR3005H STRESSES IN THE FOREST ENVIRONMENT**

The natural functioning of forest systems with emphasis on the disruption caused by stress factors in tree and forest development. Classification and identification of important stress factors including abiotic pollution, hydrology, forest pests, diseases, and competing vegetation are included. The role of environmental factors that influence forest health will be considered at the level of the cell, tree, and stand. Students will apply the principles and techniques of managing disturbed forests to both urban and general forest situations. An integrated approach to sustaining forest health will be taken through exposure to strategies of decision-making in appropriate laboratory and project assignments.

Course instructors: John Caspersen

### **FOR3006H CASE STUDY ANALYSIS IN FOREST MANAGEMENT**

The course focuses on developing skills in integrating forest management related knowledge from natural and social sciences, and offers opportunities, through discussion of case studies, to learn applications of knowledge from natural and social sciences to the solution of real-life multi-dimensional forest management problems. Concepts related to integration science and case study analysis are introduced and many case studies, related to forest conservation, forests for industrial production, forestry NGOs, international forestry, trade of forest products, wildlife management, public participation, and Aboriginal forestry are discussed.

Course instructor: Ben Kuttner

### **FOR3007Y INTERNSHIP IN FOREST CONSERVATION**

A guided research practical internship to take place in the summer following the first winter session to provide students with experience in applying concepts, principles and methods acquired in formal courses to the solution of practical forest management problems. Students, individually or in groups, will carry out detailed analyses of practical problems in forest conservation at a field location in Canada or abroad. The internship will include interaction with forest managers and individuals, or groups involved in forest-related issues. The results of the internship will be used in the subsequent fall semester to prepare practical recommendations incorporated in a consulting report, management plan or research paper, (see FOR3008F). This is a CR/NCR course.

Course coordinator: Sally Krigstin

**Note:** Summer session course/activity.

### **FOR3008H CAPSTONE PROJECT IN FOREST CONSERVATION**

This course will involve analysing information and preparing a formal report or applied forest conservation project, in consultation with individual faculty supervisors. The work is commonly based on the summer internship experience but can also be on an associated or completely different topic. Students are encouraged to identify a potential supervisor as they set up their summer internship (if not before) to ensure optimal productivity. A final seminar on the findings must be presented and its applicability defended to a broad, professionally-based audience.

Course coordinator: Patrick James

### **FOR3009H FOREST CONSERVATION BIOLOGY**

This course provides students with an understanding of the distribution and ecology of the world's major forested ecosystems and a broad grasp of major conservation biology issues in each. A summary of global physical geography and ecosystem classification in the opening weeks is followed by lectures, presentations, and discussions on key conservation biology issues organized into three modules: tropical forests, subtropical forests, and temperate forests. Topics include the evolution of concepts of forest conservation, sustainable forestry and ecosystem conservation; and the effectiveness of regulatory approaches and management practices in different societies, regions, and nations.

Course instructor: Sean Thomas

### **FOR3010H SOCIETY AND FOREST CONSERVATION**

This course will explore the forest policy dimensions of human-forest interactions and theoretical approaches to study these interactions. It will explore the role of the major policy actors in forest policy- government, industry and the foresters they employ, First Nations and Indigenous Peoples and the ENGOS- in policy decisions that impact forest conservation. Taking a model of "state interest group intermediation", we will examine the impact of state and non-state policy network actors on resource governance decisions and the implications of which interests gain and which lose in decisions about forest conservation. We will see how the resources of the policy actors, and the changing social, economic and political contexts in which they operate, are linked with the conservation of biodiversity. The course will take an Ontario perspective but will also examine forest conservation challenges and opportunities elsewhere. The course will use a mix of lectures and guests, class discussion and student-led activities to explore these issues.

Course instructor: Anne Koven

### **FOR3011H INTERNATIONAL FOREST CONSERVATION FIELD CAMP**

An intensive two-week field course based at international field stations and taking place at the beginning of the summer term following the first academic program session. (See "Field Work Note" under "Introduction".) The application of theoretical principles acquired in academic core courses to practical projects in community forestry and forest conservation. The course will involve students in group research and assessment and will include cooperation with local training and research institutes, conservation projects and non-government organizations. A number of international course locations will be used. This is a CR/NCR course.

Course coordinator: Rasoul Yousefpour

**Note:** Summer session course/activity.

### **FOR3012H ANALYTICAL METHODS IN FORESTRY**

Two 6-week modules designed to provide an introduction to practical methods in basic statistics (Jay Malcolm) and geographic information systems (GIS) (Danijela Puric-Mladenovic) complementary to the first year courses (FOR3001F and FOR3004).

Course coordinators: Danijela Puric-Mladenovic, Jay Malcolm