

COURSE FOR3010: ISSUES & TRENDS IN FORESTRY

Level: Advanced

Prerequisite: None

Description: Students analyze current local and global issues and trends in forest management, and demonstrate individual and shared actions that foster environmental stewardship.

Supporting Courses: FOR2030: Regulating Alberta's Forests
FOR2100: Forest Management

Outcomes: The student will:

1. describe current issues in forest management considering alternatives and consequences

- 1.1 describe past and present trends in the consumptive and non-consumptive use of forests
- 1.2 analyze differing points of view regarding how and to what degree Canada's forests should be used
- 1.3 identify positive and negative effects of forest industry development on people, industry and the environment (local and global scales)
- 1.4 describe issues related to the management of Alberta's forest land; e.g., access management, herbicide use in timber management, fire management, age class management, maintenance of biodiversity, climate change
- 1.5 describe ways in which different forest stakeholders make use of the judicial, legislative and regulatory systems in working toward their objectives; e.g., public advisory committees, environmental groups

2. compare and contrast issues and trends involving Canada's forests with similar issues and trends in other parts of the world

- 2.1 compare issues involving Canada's forests with similar issues in other parts of the world; e.g., land use, forest renewal processes, management of forest age class distribution, climate change and forest ecosystems, extensive versus intensive management, forest and carbon cycling
- 2.2 describe global impacts of the recreational and commercial use of forests; e.g., social and cultural, economic, environmental
- 2.3 infer the long-range effects of the sustainable use of forests in Canada and other parts of the world

3. demonstrate individual and shared actions that foster the sustainable management of forested regions

- 3.1 compare and contrast different philosophies, ethics and alternatives regarding forest resources and how best to ensure their health and sustainability
- 3.2 describe the goals and objectives of one or more forest interest groups
- 3.3 examine and defend a position on global issue regarding the consumptive and/or nonconsumptive use of forests; e.g., conduct research, develop a position, participate in debate
- 3.4 examine and apply a plan for the use of a specific forested region; e.g., conduct research, possibilities, agree to a plan that meets the needs of an acceptable number of stakeholders
- 3.5 initiate responsible and ethical actions in relation to the forest and its many resources; e.g., individual actions, shared actions, leadership roles

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:

- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:

- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:

- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

- 5.1 identify short-term and long-term goals
- 5.2 identify steps to achieve goals

COURSE FOR3060: FOREST MENSURATION 2

Level: Advanced

Prerequisite: FOR2060: Forest Mensuration 1

Description: Students build on measuring skills through researching and examining current forest inventory practices and demonstrating appropriate strategies for sampling the fibre and nonfibre value of forests.

Parameters: Access to a demonstration forest and forest measurement tools; e.g., binoculars, clinometers, computer and software, first aid supplies, soil testing kit, personal protective equipment, 30-metre tape, GPS unit computer and appropriate software.

Outcomes: The student will:

- 1. describe random and systematic sampling techniques for gathering information about the forest as a resource**
 - 1.1 describe different sampling designs and techniques, including:
 - 1.1.1 random
 - 1.1.2 systematic
 - 1.2 describe sample designs and techniques most suited to gathering data about specific forest components
 - 1.3 identify bias and error in sampling design and issues related to the use of sample data in estimating forest populations
- 2. gather sample data to estimate fibre and nonfibre values in a forested region**
 - 2.1 identify and follow safety practices and policies relevant to gathering sample data in the forest
 - 2.2 identify goals and outcomes for a forest survey
 - 2.3 identify the type and amount of information regarding the forest resource that is required
 - 2.4 design techniques for sampling the forest region that are most suited to gathering the type of information required
 - 2.5 calculate and locate the boundary of the sample area within the forest region
 - 2.6 gather data regarding the volume and/or condition of timber resources within the sample plots
 - 2.7 gather data regarding the nature of other nonfibre resources present within the sample plots
 - 2.8 record and compile sample data regarding fibre and nonfibre resources in appropriate tables and charts to estimate fibre volumes and other nonfibre values within the forest region
 - 2.9 assess the strengths and weaknesses of the sample data and conclusions made about the forest
- 3. demonstrate an understanding of the applications of forest inventory data in resource management**
 - 3.1 explain applications of timber cruise data in resource management; e.g., estimating total wood volume, projecting future forest growth, planning harvest operations
 - 3.2 explain applications of nonfibre data in resource management; e.g., monitoring water and soil quality, determining potential for recreation, monitoring wildlife population densities and trends
 - 3.3 interpret a set of sample forest survey data; e.g., consider bias, error and other limitations in the sample data, extrapolate the data to estimate forest populations, suggest applications of the data in resource management, consider modifying the sample design to increase the accuracy of the survey

4. describe current forest inventory practices

- 4.1 describe applications of technology in gathering and storing data about the forest resource; e.g., aerial photography, satellite imagery, Geographic Information Systems (GIS), computer modelling
- 4.2 explain the importance of verifying (ground truthing) data gathered through remote sensing
- 4.3 predict forest inventory technologies and practices in the future
- 4.4 outline the objectives of a current forest inventory research project; e.g., an initiative of the Canadian Forestry Service, an Alberta Research Council project

5. demonstrate basic competencies

- 5.1 demonstrate fundamental skills to:
 - 5.1.1 communicate
 - 5.1.2 manage information
 - 5.1.3 use numbers
 - 5.1.4 think and solve problems
- 5.2 demonstrate personal management skills to:
 - 5.2.1 demonstrate positive attitudes and behaviours
 - 5.2.2 be responsible
 - 5.2.3 be adaptable
 - 5.2.4 learn continuously
 - 5.2.5 work safely
- 5.3 demonstrate teamwork skills to:
 - 5.3.1 work with others
 - 5.3.2 participate in projects and tasks

6. create a transitional strategy to accommodate personal changes and build personal values

- 6.1 identify short-term and long-term goals
- 6.2 identify steps to achieve goals

COURSE FOR3080: FOREST RESEARCH & DEVELOPMENT

Level: Advanced

Prerequisite: None

Description: Students examine current and emerging research and development in the forest industry.

Outcomes: The student will:

- 1. examine different areas of forest research presently being conducted in Canada and Alberta**
 - 1.1 identify and describe different areas of forest research being conducted in Canada and Alberta; e.g., silviculture, harvesting systems, forest products, forest protection, wildlife inventories, ecological studies, landscape level management, Geographic Information System (GIS), computer modelling, tree improvement
 - 1.2 compare the goals and priorities of local agencies whose mandate is to conduct research related to forestry and forest ecosystems; e.g., individuals, corporations, colleges and universities, government agencies
 - 1.3 explain the role of the various forest agencies in coordinating forest research activities in Alberta; e.g., Boreal Forest Research Centre, FPInnovations, Natural Resources Canada
 - 1.4 describe the applications of data banks and information systems in making forest management decisions
 - 1.5 identify major components of a research plan for the enhanced use and/or management of forests; e.g., goals and objectives of the plan, economic, political, scientific and other related factors, methodologies and strategies, outcomes and types of data obtained, limitations of the plan or information that may be lacking or incomplete
- 2. cite examples of current and emerging research and development used in the forest industry**
 - 2.1 describe past and present applications of research and development in the forest industry; e.g., nursery operations, silviculture, harvesting technologies, wood production and use, biotechnology, biochemistry, wood technology
 - 2.2 describe emerging applications of research and development in the forest industry; e.g., nano technologies
 - 2.3 describe the advantages and disadvantages of a recent technology designed to enhance our use and/or management of forests; e.g., social, economic, environmental
- 3. demonstrate basic competencies**
 - 3.1 demonstrate fundamental skills to:
 - 3.1.1 communicate
 - 3.1.2 manage information
 - 3.1.3 use numbers
 - 3.1.4 think and solve problems
 - 3.2 demonstrate personal management skills to:
 - 3.2.1 demonstrate positive attitudes and behaviours
 - 3.2.2 be responsible
 - 3.2.3 be adaptable
 - 3.2.4 learn continuously
 - 3.2.5 work safely

- 3.3 demonstrate teamwork skills to:
 - 3.3.1 work with others
 - 3.3.2 participate in projects and tasks
- 4. create a transitional strategy to accommodate personal changes and build personal values**
 - 4.1 identify short-term and long-term goals
 - 4.2 identify steps to achieve goals

COURSE FOR3090: FOREST ECOLOGY – SILVICS & SUCCESSION

Level: Advanced

Prerequisites: FOR1020: Forest Ecology in Regions of Canada *or* Biology 20
HCS2020: First Aid/CPR with AED

Description: Students investigate the interrelationships among soil, water, air, trees and the environment and explain how forests change over time as a result of these interrelationships.

Parameters: Access to a forest environment.

Outcomes: The student will:

- 1. explain the effects of soil, air and water characteristics on forest ecosystems**
 - 1.1 describe the physical characteristics used to classify forest soils, and the effects of different soils on plant growth; e.g., texture, porosity
 - 1.2 explain the functions of organic and inorganic components of forest soils; e.g., micro- and macro-organisms, gases and minerals, organic matter, water
 - 1.3 describe the effects of soil acidity, alkalinity and temperature on the growth of trees and other forest plants
 - 1.4 describe indicators of water quantity in the forest and its effects on trees and other plants; e.g., surface water, ground water
 - 1.5 describe the effects of human activity on forest ecosystems; e.g., urbanization, agriculture, industrial development, forest harvest practice
 - 1.6 describe the effects of a forest on the local environment; e.g., soil and water, weather, wildlife
 - 1.7 infer the effects of forests worldwide on global climates
- 2. identify factors that determine the presence of tree species and forest ecosystems in particular environments**
 - 2.1 explain how each tree species has unique site and climatic requirements that determine its ability to grow in particular environments
 - 2.2 describe the general characteristics, life history, and site and climatic requirements of five Alberta species
 - 2.3 describe the general structural characteristics and environments of some common forest environments in Alberta; e.g., soil, moisture, position on slope
- 3. explain the process of change in a forest environment**
 - 3.1 identify living and nonliving agents of change in a local forest environment
 - 3.2 infer structural and/or behavioural adaptations of living organisms to particular changes in the forest environment; e.g., adaptations to site conditions, reproductive adaptations
 - 3.3 describe the impacts of specific environmental changes on a forest community; e.g., short-term consequences, long-term consequences
 - 3.4 give examples of primary and secondary successional stages in a local forest environment
 - 3.5 describe Alberta's natural forest history; e.g., roles of fire, climate change and other agents
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems

- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. create a transitional strategy to accommodate personal changes and build personal values**
 - 5.1 identify short-term and long-term goals
 - 5.2 identify steps to achieve goals

COURSE FOR3110: SILVICULTURE

Level: Advanced

Prerequisite: None

Description: Students demonstrate knowledge of the techniques used to establish, grow and harvest tree crops.

Parameters: Access to a demonstration forest.

Outcomes: The student will:

1. describe silviculture and the silvics of Alberta forest species

- 1.1 define silviculture
- 1.2 identify major components of silvicultural systems; e.g., stand establishment, stand management, harvest and re-establishment
- 1.3 explain how individual tree species have unique ecological requirements that determine suitable silvicultural practices
- 1.4 compare and contrast the ecological requirements and silvics for two or more Alberta tree species
- 1.5 describe the reasons for selecting species with the appropriate silvics for revegetating reclaimed rights of way or industrial sites
- 1.6 describe one or more research programs designed to improve silvicultural practices; e.g., tree improvement, geographic information systems, harvesting operations

2. demonstrate practices used to establish a stand of trees and manipulate growing conditions to favour particular species

- 2.1 demonstrate methods of regeneration where seedlings are established by natural methods; e.g., naturally supplied seeds, vegetative reproduction
- 2.2 demonstrate methods of regeneration where seedlings are established by artificial methods; e.g., planting bare-root and container seedlings, broadcasting seeds
- 2.3 compare natural methods of regeneration with artificial methods
- 2.4 demonstrate techniques for site preparation and the care and planting of seeds and seedlings
- 2.5 demonstrate intermediate stand tending techniques; e.g., cleaning, thinning, pruning, fertilizing, protecting
- 2.6 describe revegetation practices for industrial sites with reference to soil de-compaction and remediation
- 2.7 identify safety practices and policies relevant to site preparation, tree planting and stand tending
- 2.8 distinguish between intensive and extensive stand management practices

3. describe and compare methods of harvesting tree species

- 3.1 identify important factors in choosing a suitable method of harvest; e.g., growth characteristics, intended use, regeneration of species, species sun tolerance
- 3.2 describe variable retention harvesting
- 3.3 relate appropriate harvest methods to individual tree species considering their sun tolerance
- 3.4 describe the implications of partial cuts on the need for more access construction (roads)

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:

- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:

- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:

- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

- 5.1 identify short-term and long-term goals
- 5.2 identify steps to achieve goals

COURSE FOR3910: FOR PROJECT D

Level: Advanced

Prerequisite: None

Description: Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

Parameters: Advanced project courses must connect with a minimum of two CTS courses, one of which must be at the advanced level and be in the same occupational area as the project course. The other CTS course(s) must be at least at the intermediate level from any occupational area.

Project courses cannot be connected to other project courses or practicum courses.

All projects and/or performances, whether teacher- or student-led, must include a course outline or student proposal.

Outcomes:

The teacher/student will:

- 1. identify the connection between this project course and two or more CTS courses**
 - 1.1 identify the outcome(s) from each identified CTS course that support the project and/or performance deliverables
 - 1.2 explain how these outcomes are being connected to the project and/or performance deliverables
- 2. propose the project and/or performance**
 - 2.1 identify the project and/or performance by:
 - 2.1.1 preparing a plan
 - 2.1.2 clarifying the purposes
 - 2.1.3 defining the deliverables
 - 2.1.4 specifying time lines
 - 2.1.5 explaining terminology, tools and processes
 - 2.1.6 defining resources; e.g., materials, costs, staffing
 - 2.2 identify and comply with all related health and safety standards
 - 2.3 define assessment standards (indicators for success)
 - 2.4 present the proposal and obtain necessary approvals

The student will:

- 3. meet goals as defined within the plan**
 - 3.1 complete the project and/or performance as outlined
 - 3.2 monitor the project and/or performance and make necessary adjustments
 - 3.3 present the project and/or performance, indicating the:
 - 3.3.1 outcomes attained
 - 3.3.2 relationship of outcomes to goals originally set

- 3.4 evaluate the project and/or performance, indicating the:
 - 3.4.1 processes and strategies used
 - 3.4.2 recommendations on how the project and/or performance could have been improved
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
 - 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
 - 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. create a transitional strategy to accommodate personal changes and build personal values**
 - 5.1 identify short-term and long-term goals
 - 5.2 identify steps to achieve goals

COURSE FOR3920: FOR PROJECT E

Level: Advanced

Prerequisite: None

Description: Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

Parameters: Advanced project courses must connect with a minimum of two CTS courses, one of which must be at the advanced level and be in the same occupational area as the project course. The other CTS course(s) must be at least at the intermediate level from any occupational area.

Project courses cannot be connected to other project courses or practicum courses.

All projects and/or performances, whether teacher- or student-led, must include a course outline or student proposal.

Outcomes:

The teacher/student will:

- 1. identify the connection between this project course and two or more CTS courses**
 - 1.1 identify the outcome(s) from each identified CTS course that support the project and/or performance deliverables
 - 1.2 explain how these outcomes are being connected to the project and/or performance deliverables
- 2. propose the project and/or performance**
 - 2.1 identify the project and/or performance by:
 - 2.1.1 preparing a plan
 - 2.1.2 clarifying the purposes
 - 2.1.3 defining the deliverables
 - 2.1.4 specifying time lines
 - 2.1.5 explaining terminology, tools and processes
 - 2.1.6 defining resources; e.g., materials, costs, staffing
 - 2.2 identify and comply with all related health and safety standards
 - 2.3 define assessment standards (indicators for success)
 - 2.4 present the proposal and obtain necessary approvals

The student will:

- 3. meet goals as defined within the plan**
 - 3.1 complete the project and/or performance as outlined
 - 3.2 monitor the project and/or performance and make necessary adjustments
 - 3.3 present the project and/or performance, indicating the:
 - 3.3.1 outcomes attained
 - 3.3.2 relationship of outcomes to goals originally set

- 3.4 evaluate the project and/or performance, indicating the:
 - 3.4.1 processes and strategies used
 - 3.4.2 recommendations on how the project and/or performance could have been improved
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
 - 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
 - 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. create a transitional strategy to accommodate personal changes and build personal values**
 - 5.1 identify short-term and long-term goals
 - 5.2 identify steps to achieve goals

COURSE FOR3950: FOR ADVANCED PRACTICUM

Level: Advanced

Prerequisite: None

Description: Students apply prior learning and demonstrate the attitudes, skills and knowledge required by an external organization to achieve a credential/credentials or an articulation.

Parameters: This practicum course, which may be delivered on- or off-campus, should be accessed only by students continuing to work toward attaining a recognized credential/credentials or an articulation offered by an external organization. This course must be connected to at least one CTS course from the same occupational area and cannot be used in conjunction with any introductory (1XXX) level course. A practicum course cannot be delivered as a stand-alone course, cannot be combined with a CTS project course and cannot be used in conjunction with the Registered Apprenticeship Program or the Green Certificate Program.

Outcomes: The student will:

- 1. perform assigned tasks and responsibilities, as required by the organization granting the credential(s) or articulation**
 - 1.1 identify regulations and regulatory bodies related to the credential(s) or articulation
 - 1.2 describe personal roles and responsibilities, including:
 - 1.2.1 key responsibilities
 - 1.2.2 support functions/responsibilities/expectations
 - 1.2.3 code of ethics and/or conduct
 - 1.3 describe personal work responsibilities and categorize them as:
 - 1.3.1 routine tasks; e.g., daily, weekly, monthly, yearly
 - 1.3.2 non-routine tasks; e.g., emergencies
 - 1.3.3 tasks requiring personal judgement
 - 1.3.4 tasks requiring approval of a supervisor
 - 1.4 demonstrate basic employability skills and perform assigned tasks and responsibilities related to the credential(s) or articulation
- 2. analyze personal performance in relation to established standards**
 - 2.1 evaluate application of the attitudes, skills and knowledge developed in related CTS courses
 - 2.2 evaluate standards of performance in terms of:
 - 2.2.1 quality of work
 - 2.2.2 quantity of work
 - 2.3 evaluate adherence to workplace legislation related to health and safety
 - 2.4 evaluate the performance requirements of an individual who is trained, experienced and employed in a related occupation in terms of:
 - 2.4.1 training and certification
 - 2.4.2 interpersonal skills
 - 2.4.3 technical skills
 - 2.4.4 ethics

3. demonstrate basic competencies

3.1 demonstrate fundamental skills to:

- 3.1.1 communicate
- 3.1.2 manage information
- 3.1.3 use numbers
- 3.1.4 think and solve problems

3.2 demonstrate personal management skills to:

- 3.2.1 demonstrate positive attitudes and behaviours
- 3.2.2 be responsible
- 3.2.3 be adaptable
- 3.2.4 learn continuously
- 3.2.5 work safely

3.3 demonstrate teamwork skills to:

- 3.3.1 work with others
- 3.3.2 participate in projects and tasks

4. create a transitional strategy to accommodate personal changes and build personal values

4.1 identify short-term and long-term goals

4.2 identify steps to achieve goals