COURSE FOR1010: FORESTS & SOCIETY

Level: Introductory

Prerequisite: None

Description: Students study the social, cultural, economic and environmental significance of forests, with particular focus on the impact of society as a whole and the impact individuals have had on forests.

Outcomes: The student will:

1. **compare the social, economic and environmental significance of forests**
   - 1.1 examine the economic significance of forests at local, national and global levels, including but not limited to:
     - 1.1.1 direct and indirect employment
     - 1.1.2 forest products and export values
     - 1.1.3 tourism
     - 1.1.4 subsistence
     - 1.1.5 tax revenue
   - 1.2 examine the environmental significance of forests in local, national and global contexts, including but not limited to:
     - 1.2.1 wildlife habitat
     - 1.2.2 watershed protection and maintenance
     - 1.2.3 water, air and soil quality
     - 1.2.4 maintenance of ecosystems
     - 1.2.5 climate change
   - 1.3 examine the social and cultural significance of forests, including but not limited to:
     - 1.3.1 entertainment and recreation
     - 1.3.2 spirituality
2. **explain how personal needs, wants, beliefs and actions may influence forest resources**
   - 2.1 describe how consumer and marketing trends in society may affect forest resources, including but not limited to:
     - 2.1.1 needs versus wants
     - 2.1.2 media influence
     - 2.1.3 third party environmental certification (CSA, ISO, Forest Stewardship Council)
     - 2.1.4 use of environmentally friendly products
   - 2.2 describe the impact of individual attitudes, actions and lifestyles on forest resources, including but not limited to:
     - 2.2.1 conservation and sustainability ethics
     - 2.2.2 consumer practices and trends
     - 2.2.3 recreational patterns
3. **demonstrate knowledge about public land use**
   - 3.1 identify public forested land in Alberta
   - 3.2 identify and explain the implementation of legislation and policies that govern the use of public lands, including but not limited to:
     - 3.2.1 tenure
     - 3.2.2 reclamation
     - 3.2.3 reforestation

4. **review historical use of the forests by First Nations peoples and European and Asian settlers, and the agriculture and oil industry**
   - 4.1 examine traditional First Nations values related to forests and land tenures
   - 4.2 demonstrate an appreciation for cultural awareness
   - 4.3 examine land use and forest attitudes demonstrated by early settlers
   - 4.4 show how agriculture and oil production have had an impact on forests in Alberta, today and in the past
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. **make personal connections to the cluster content and processes to inform possible pathway choices**
   - 6.1 complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences
   - 6.2 create a connection between a personal inventory and occupational choices

COURSE FOR1020: FOREST ECOLOGY IN REGIONS OF CANADA

Level: Introductory

Prerequisite: None

Description: Students investigate forest ecosystems and explain the structure and function of trees in relation to life processes. Students also learn to identify factors that determine the distribution of forests, as well as research forest regions of Canada with an emphasis on specific species.

Parameters: Access to relevant government and library resources.

Outcomes: The student will:

1. **describe the structural units of trees and their function in performing life processes**
   - 1.1 explain the vital life processes performed by trees and other forest plants; e.g., nutrient intake and transportation, photosynthesis, respiration and transpiration, reproduction, phrenology (leaf flushings, leaf fall, flowering and cone production)
   - 1.2 describe structural units and component parts of trees, e.g., root, trunk/stem, leaf, flower, and their role in performing vital life processes
2. **describe the interrelationships among elements in the forest ecosystem**
   - 2.1 define and provide examples of: ecology/ecosystems, abiotic/biotic factors, abiotic/biotic interactions, populations, communities and succession
   - 2.2 identify living and nonliving elements within a local forest ecosystem; e.g., soil characteristics, land form, climate, flora and fauna, soil organisms
3. **explore the various elements that affect the health of a forest**
   - 3.1 explain why the biggest key to a forest's health is diversity, considering a variety of:
     - 3.1.1 plants
     - 3.1.2 animals
     - 3.1.3 microorganisms
     - 3.1.4 natural processes; e.g., fire, climate
   - 3.2 describe how a tree's life span is impacted by native and non-native:
     - 3.2.1 weeds
     - 3.2.2 pests
     - 3.2.3 diseases
4. **define and compare angiosperms (broadleaf forest) and gymnosperms (conifer, montane or needleleaf forests)**
5. **locate and describe the forest regions of Canada**
   - 5.1 explain the need for categorizing forest types
   - 5.2 locate and describe the following eight forest regions of Canada:
     - 5.2.1 Boreal
     - 5.2.2 Subalpine
     - 5.2.3 Montane
     - 5.2.4 Coast
     - 5.2.5 Columbia
     - 5.2.6 Deciduous
     - 5.2.7 Great Lakes/St. Lawrence
     - 5.2.8 Acadian
   - 5.3 read and interpret visual representations of forest region distribution in Canada

6. **identify factors that affect the development of forests and determine the distribution of forest regions, considering climate, topography/geology, soil classifications, natural activity (e.g., fire, disease) and human activity**
7. **identify common trees and other flora that grow in specific regions of Canada; e.g., tree and shrubs identification, non-woody plant identification, commercial species**
8. **identify and classify various provincial flora samples (e.g., trees, shrubs and non-woody plants) from their parts (e.g., leaves, flowers/cones, twigs, bark) using identification keys**
9. **demonstrate basic competencies**
   - 9.1 demonstrate fundamental skills to:
     - 9.1.1 communicate
     - 9.1.2 manage information
     - 9.1.3 use numbers
     - 9.1.4 think and solve problems
   - 9.2 demonstrate personal management skills to:
     - 9.2.1 demonstrate positive attitudes and behaviours
     - 9.2.2 be responsible
     - 9.2.3 be adaptable
     - 9.2.4 learn continuously
     - 9.2.5 work safely
   - 9.3 demonstrate teamwork skills to:
     - 9.3.1 work with others
     - 9.3.2 participate in projects and tasks
10. **make personal connections to the cluster content and processes to inform possible pathway choices**
    - 10.1 complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences
    - 10.2 create a connection between a personal inventory and occupational choices

COURSE FOR1050: FOREST IMAGERY

Level: Introductory

Prerequisite: None

Description: Students interpret information from different types of visual data representations used in the forest industry.

Parameters: Access to maps, land images, compasses and GPS units.

Outcomes: The student will:

1. identify and explain different types of maps and remote imaging used in the forest industry
- 1.1 examine different types of maps used in the forest industry, including but not limited to:
  - 1.1.1 base maps
  - 1.1.2 topographic/contour maps
  - 1.1.3 soil type maps
  - 1.1.4 forest stand or type maps
- 1.2 describe components and applications of the National Topographic Grid System and the Western Grid Survey System
- 1.3 explain the purpose and techniques of remote sensing, including but not limited to:
  - 1.3.1 aerial photography
  - 1.3.2 satellite imagery
  - 1.3.3 thermal imaging
- 1.4 compare the applications of remote sensing in the forest industry

2. interpret and apply information from maps and digital imaging
- 2.1 interpret and draw conclusions based on common types of images captured by various remote sensing sources
- 2.2 examine information-gathering technologies and explain their applications in mapping, including but not limited to:
  - 2.2.1 satellite imagery
  - 2.2.2 Global Positioning Systems (GPS)
  - 2.2.3 Geographic Information Systems (GIS)
- 2.3 use hand compass and map orienteering skills
- 2.4 demonstrate GPS orienteering skills
- 2.5 locate a point/parcel on a map, using:
  - 2.5.1 legal survey description
  - 2.5.2 latitude and longitude
  - 2.5.3 UTM Grid System (use 1:50000 Canada Topographical Series Maps)
- 2.6 use topographical maps to:
  - 2.6.1 determine land terrain; e.g., steep, flat
  - 2.6.2 calculate distance and area
- 2.7 demonstrate applications of aerial photographs in the stereoscopic viewing of topographic features
- 2.8 compare details of maps used by the forest industry and aerial photographs with existing ground conditions
- 2.9 compare details of an aerial photograph or digital image with corresponding parts of a forest cover map

3. demonstrate procedures used to create maps

3.1 explain the construction of two-dimensional maps based on information gathered from various sources; e.g., aerial photographs, digital images

3.2 construct a simple map that represents a local forested area, including:

- 3.2.1 scale and measurement
- 3.2.2 legend
- 3.2.3 major land and forest features
- 3.2.4 topography

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. make personal connections to the cluster content and processes to inform possible pathway choices

5.1 complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences

5.2 create a connection between a personal inventory and occupational choices

COURSE FOR1100: FOREST USE & PROTECTION

Level: Introductory

Prerequisite: None

Description: Students examine past and present uses of Canada's forests, and how research and technology impact forest management.

Outcomes: The student will:

1. **describe past and present uses of forests in Alberta and Canada**
   - 1.1 describe changing patterns of forest use in Alberta and Canada from past to present
   - 1.2 describe the history of the management of forested lands in Alberta and Canada
   - 1.3 explain the impact of historical trends in forest use and ownership on people, the economy and the environment
   - 1.4 make predictions about the use of Canada's forest resources in the future
2. **explain how the consumptive and non-consumptive use of forests has created a need for the sustainable management of forested regions**
   - 2.1 compare different uses of forested regions in terms of their advantages and disadvantages; e.g., environmental, economic, social
   - 2.2 describe the roles of different interest groups in managing forest resources; e.g., government, forest industry, general public, other stakeholder groups
   - 2.3 relate concepts of sustainable management to practical strategies for managing forest resources; e.g., cumulative effects
   - 2.4 describe an issue regarding sustainable development and/or sustained yield; e.g., conduct research, develop a position, participate in debate
   - 2.5 describe the intent of an integrated resource plan
3. **describe the role of research and technology in forest protection**
   - 3.1 explain reasons for protecting the forest resource; e.g., material and non-material benefits, environmental impact
   - 3.2 identify and describe major components of forest protection, including:
     - 3.2.1 forest fire management
     - 3.2.2 soil conservation
     - 3.2.3 land reclamation
     - 3.2.4 pest and disease management
   - 3.3 explain basic goals and techniques of forest fire management
   - 3.4 describe the basic goals and principles of soil and water management and land reclamation
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. make personal connections to the cluster content and processes to inform possible pathway choices

5.1 complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences

5.2 create a connection between a personal inventory and occupational choices

COURSE FOR1910: FOR PROJECT A

Level: Introductory

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: Introductory project courses must connect with a minimum of two CTS courses, one of which must be at the introductory level and be in the same occupational area as the project course. The other CTS course(s) can be either at the same level or 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. make personal connections to the cluster content and processes to inform possible pathway choices

5.1 complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences
5.2 create a connection between a personal inventory and occupational choices

COURSE FOR2010: FOREST PROTECTION & STEWARDSHIP

Level: Intermediate

Prerequisite: None

Description: Students examine the *Land-use Framework* and the *Alberta Land Stewardship Act* as they relate to forestry to understand what measures are being taken to promote environmental stewardship.

Note: Although this course involves analyzing the impact of lifestyle on forests, the major emphasis is on active participation through protection and stewardship (e.g., commitment and empowerment through personal and shared actions).

Outcomes: The student will:

1. **demonstrate an understanding of the social contract that exists between the public of Alberta and the industrial users of forested public land (Alberta's policies on integrated resource planning)**
2. **identify different demands on the forest and the needs of each forest user**
   - 2.1 identify and describe four or more major types of forest uses; e.g., industrial, recreational, wildlife habitat, water, air and soil quality
   - 2.2 describe specific uses of and multiple demands placed upon forested land; e.g., wood fibre production, wildlife management, grazing and range management, watershed, oil, gas and mining, recreation, protected areas
   - 2.3 explain why forests can and should serve many purposes
   - 2.4 describe examples of a variety of uses of Alberta's forests; e.g., using different parts of the forest for different purposes, using the same area of the forest for more than one purpose
3. **explore the *Land-use Framework* for Alberta, focusing on forest use**
   - 3.1 identify the main purposes of the Framework, including:
     - 3.1.1 development of seven regional land-use plans based on seven new land-use regions
     - 3.1.2 creation of a land-use secretariat (Secretariat) and establishment of a Regional Advisory Council for each region
     - 3.1.3 consideration of the cumulative effects that regional management will have in regard to impacts of development on land, water and air
     - 3.1.4 development of a strategy for conservation and stewardship on private and public lands
     - 3.1.5 promotion of efficient use of land to reduce the footprint of human activities on Alberta's landscape
     - 3.1.6 establishment of an information, monitoring and knowledge system to contribute to continuous improvement of land-use planning and decision making
     - 3.1.7 inclusion of Aboriginal peoples in land-use planning
   - 3.2 describe how forest management planning must address all land base users
   - 3.3 explain how the document addresses cumulative effects and reduces the human footprint
4. **explore the *Alberta Land Stewardship Act*, focusing on forest use**
   - 4.1 identify the main purposes of the Act, including:
     - 4.1.1 provision of a means by which the government can give direction and provide leadership in identifying the objectives of the province of Alberta, including economic, environmental and social objectives

4.1.2 provision of a means to plan for the future, recognizing the need to manage activity to meet the reasonably foreseeable needs of current and future generations of Albertans, including Aboriginal peoples
4.1.3 creation of legislation and policy that enable sustainable development by taking account of and responding to the cumulative effects of human endeavour and other events

5. demonstrate, through personal and shared actions, a commitment to environmental stewardship

5.1 identify personal strategies for using forest resources that foster the attainment of social, cultural, economic and environmental goals; e.g., personal actions, leadership roles
5.2 examine and defend an issue regarding the impacts of lifestyle on forest resources
5.3 identify opportunities in which individuals can influence public decisions that affect the forest and all its resources; e.g., voting, lobbying, seeking office, special interest groups

6. demonstrate basic competencies

6.1 demonstrate fundamental skills to:
6.1.1 communicate
6.1.2 manage information
6.1.3 use numbers
6.1.4 think and solve problems
6.2 demonstrate personal management skills to:
6.2.1 demonstrate positive attitudes and behaviours
6.2.2 be responsible
6.2.3 be adaptable
6.2.4 learn continuously
6.2.5 work safely
6.3 demonstrate teamwork skills to:
6.3.1 work with others
6.3.2 participate in projects and tasks

7. identify possible life roles related to the skills and content of this cluster

7.1 recognize and then analyze the opportunities and barriers in the immediate environment
7.2 identify potential resources to minimize barriers and maximize opportunities

COURSE FOR2030: REGULATING ALBERTA'S FORESTS

Level: Intermediate

Prerequisite: FOR1100: Forest Use & Protection

Description: Students research agencies and structures used to manage forested lands in Alberta and explain Alberta's forest management goals.

Outcomes: The student will:

1. **explain how Alberta's forested lands are managed**
   - 1.1 describe major changes that have occurred historically regarding the ownership and administration of forested lands in Alberta, considering:
     - 1.1.1 federal jurisdiction
     - 1.1.2 provincial status
     - 1.1.3 *Natural Resources Transfer Act*
   - 1.2 describe different land tenures in Alberta today, including:
     - 1.2.1 public (provincial and federal crown lands)
     - 1.2.2 private
   - 1.3 identify, locate and compare different land management areas in Alberta, including:
     - 1.3.1 the white area
     - 1.3.2 the green area
   - 1.4 identify the various agencies or groups responsible for managing forested lands within Alberta's boundaries, identify the proportion of land under their jurisdiction and describe their mandates
2. **describe government legislation and policies that influence the use of Alberta's forest resources**
   - 2.1 compare how activities in Alberta's forests are subject to a variety of government legislation and regulations
   - 2.2 analyze important government legislation in managing the forest; e.g. *Land-use Framework* of Alberta, *Alberta Land Stewardship Act*
   - 2.3 explain the role of regulations and guidelines established in association with government legislation in managing the forest
   - 2.4 examine the short- and long-term effects of selected government legislation and regulations on forested land
   - 2.5 research First Nations, Métis and Inuit land ownership structures and traditional uses of the land with regards to:
     - 2.5.1 Treaty Seven
     - 2.5.2 Treaty Eight
     - 2.5.3 Métis Colonies
     - 2.5.4 Nonstatus communities
3. **explain methods of allocating land and timber in forest management**
   - 3.1 explain the use of dispositions in managing commercial activities on forested lands and list all types of timber disposition
   - 3.2 describe other types of dispositions that are used to manage nontimber aspects of forest use
   - 3.3 research the referral process and conditions necessary for obtaining a disposition
   - 3.4 describe the conditions necessary for successfully obtaining a reclamation certificate

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. identify possible life roles related to the skills and content of this cluster

5.1 recognize and then analyze the opportunities and barriers in your immediate environment

5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE FOR2060: FOREST MENSURATION 1

Level: Intermediate

Prerequisites: FOR1050: Forest Imagery
HCS2020: First Aid/CPR with AED
WLD1130: Outdoor Survival Skills

Description: Students are introduced to basic forest measurement skills used in basic statistical analysis and data compilation for a forested region.

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.

Outcomes: The student will:

1. **explain the goals and techniques for surveying forests**
   - 1.1 identify reasons for conducting a forest survey; e.g., types of information gathered, interpretation of the information for decision making
   - 1.2 distinguish between forest samples and forest populations
   - 1.3 describe basic techniques used to sample a forested area; e.g., layout of sample plots, data collection techniques
   - 1.4 explain how sample data may be used to estimate fibre volumes and other nonfibre forest resources
2. **demonstrate basic mensuration used in forest inventory practices**
   - 2.1 demonstrate safe practices and policies relevant to gathering sample data in the forest
   - 2.2 demonstrate basic compass skills to establish direction in the forest; e.g., orient a map, establish and follow a bearing
   - 2.3 calculate horizontal distance in the forest using pacing and chaining methods
   - 2.4 demonstrate open and closed traverses in the forest using compass and chaining skills
   - 2.5 calculate the diameter of trees using a diameter tape or other suitable equipment
   - 2.6 calculate the height of trees using a clinometre and measuring tape or other suitable equipment
   - 2.7 demonstrate techniques used to determine the age of trees
3. **gather and interpret sample data to determine fibre volumes in a forested region**
   - 3.1 demonstrate compass and chaining skills to establish boundaries for a sample forest plot
   - 3.2 record sample data in appropriate tables and/or charts
   - 3.3 explain the importance of data regarding one or more aspects of a fibre resource within a sample forest plot; e.g., tree height/diameter, number and distribution of species, age of trees
   - 3.4 interpret sample data regarding tree populations and fibre values in a forest region
   - 3.5 manipulate sample data as required to estimate fibre volumes
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. identify possible life roles related to the skills and content of this cluster

5.1 recognize and then analyze the opportunities and barriers in your immediate environment

5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE FOR2070: SUSTAINABLE FIBRE HARVESTING & PROCESSING

Level: Intermediate

Prerequisite: None

Description: Students examine sustainable forest management plans and the process of harvesting and using forest resources.

Outcomes: The student will:

1. **identify major components of a sustainable forest land management plan**
   - 1.1 identify long-term (200 year) planning goals, considering:
     - 1.1.1 inventory
     - 1.1.2 growth and yield
     - 1.1.3 sustainability policy
   - 1.2 identify medium-term (detailed forest management plan—10 year) planning goals, considering:
     - 1.2.1 changes in conditions
     - 1.2.2 AAC calculations
     - 1.2.3 harvest sequence
     - 1.2.4 public and/or First Nation advisory committee input
     - 1.2.5 cumulative effects and integrating other resource uses
   - 1.3 identify short-term (annual operating plan) planning goals, considering:
     - 1.3.1 block and road layout through emulating natural disturbances (fire, insects, disease and weather)
     - 1.3.2 operation protection for watershed, soil values, wildlife and special areas of interest
2. **develop a forest management plan**
3. **describe the mechanics of harvesting trees**
   - 3.1 identify safety legislation and requirements relevant to visiting a forest harvest site
   - 3.2 identify stages in the harvesting procedure from stump to mill, including falling, skidding/forwarding, delimbing, bucking, sorting and/or chipping, loading and hauling
   - 3.3 describe techniques and equipment used to harvest trees
   - 3.4 describe techniques and equipment used to transport logs and/or chips/fibre from landing site to mill
   - 3.5 describe techniques used in slash management, reforestation and road reclamation/rehabilitation following logging operations
4. **explain techniques used in the utilization of wood and product formation**
   - 4.1 identify major categories of forest products and give examples of each, considering:
     - 4.1.1 pulp and paper
     - 4.1.2 solid wood products
     - 4.1.3 panel board; e.g., veneer, oriented strand board, fibre board, plywood
     - 4.1.4 chemical and medicinal products
     - 4.1.5 bio-energy
   - 4.2 describe the steps and processes involved in log utilization at a sawmill
   - 4.3 describe the steps and processes involved in wood utilization at a pulp mill, including:
     - 4.3.1 mechanical processes
     - 4.3.2 chemical processes
   - 4.4 explain how the processing of wood can be used in the co-generation of energy

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. identify possible life roles related to the skills and content of this cluster

6.1 recognize and then analyze the opportunities and barriers in your immediate environment

6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE FOR2100: FOREST MANAGEMENT

Level: Intermediate

Prerequisite: FOR1100: Forest Use & Protection

Description: Students examine Alberta's current forest management goals and explore the current management practices used to address these goals.

Outcomes: The student will:

1. **explain the goals of forest management in Alberta**
   - 1.1 discuss the goals of sustainable development within the context of Alberta's forests
   - 1.2 relate the concept of sustained yield to a system of harvesting and reforestation
   - 1.3 explain the intent of a reclamation certificate for forest land users in Alberta
   - 1.4 identify scientific, economic and social factors addressed through the management of forested lands in Alberta
2. **examine different types of forest uses and users in the forest**
   - 2.1 compare uses and values of Alberta's forests with regards to current rules, regulations and dispositions, considering:
     - 2.1.1 recreation and aesthetics
     - 2.1.2 wildlife habitat
     - 2.1.3 fibre production
     - 2.1.4 range lands
     - 2.1.5 coal and petroleum projects
     - 2.1.6 hunting and trapping
     - 2.1.7 water, air and soil quality
     - 2.1.8 cumulative effects
     - 2.1.9 First Nations traditional land uses
   - 2.2 describe the different uses of Alberta's forests and the resulting impacts; e.g., recreational, environmental, industrial
   - 2.3 examine the need for consultation with all users and public involvement in forest management
3. **describe sustainable management practices within the context of Alberta's forested lands**
   - 3.1 identify components of conservation and utilization in current forest management practices
   - 3.2 describe the mandates of the agencies responsible for managing Alberta's forested lands
   - 3.3 describe current management practices that make Alberta's productive forests available to industry for commercial harvest, considering:
     - 3.3.1 forest management agreements
     - 3.3.2 quota certificates
     - 3.3.3 commercial timber permits
     - 3.3.4 local timber permits
     - 3.3.5 other forest use dispositions; e.g., grazing, roads, pipelines
   - 3.4 predict factors likely to influence future forest management practices
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. identify possible life roles related to the skills and content of this cluster

5.1 recognize and then analyze the opportunities and barriers in the immediate environment

5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE FOR2910: FOR PROJECT B

Level: Intermediate

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: Intermediate project courses must connect with a minimum of two CTS courses, one of which must be at the intermediate level and be in the same occupational area as the project course. The other CTS course(s) can be at any 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. identify possible life roles related to the skills and content of this cluster

5.1 recognize and then analyze the opportunities and barriers in the immediate environment
5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE FOR2920: FOR PROJECT C

Level: Intermediate

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: Intermediate project courses must connect with a minimum of two CTS courses, one of which must be at the intermediate level and be in the same occupational area as the project course. The other CTS course(s) can be at any 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. identify possible life roles related to the skills and content of this cluster

5.1 recognize and then analyze the opportunities and barriers in the immediate environment
5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE FOR2950: FOR INTERMEDIATE PRACTICUM

Level: Intermediate

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 advanced (3XXX) 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. identify possible life roles related to the skills and content of this cluster

4.1 recognize and then analyze the opportunities and barriers in the immediate environment

4.2 identify potential resources to minimize barriers and maximize opportunities

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 Mensuration1

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