COURSE AGR1010: INTRODUCTION TO AGRICULTURE

Level: Introductory

Prerequisite: None

Description: Students explore and gain an understanding of the diversity and significance of agriculture.

Outcomes: The student will:

1. **demonstrate an understanding of the diversity of agricultural activity in Alberta, Canada and the global community**
   - 1.1 describe the history and development of agriculture; e.g., marketing boards, farm-owned co-operatives, crop breeding, high efficiency farming methods, conservation methods, women in agriculture
   - 1.2 explain the function of subsistence agriculture and commercial agriculture
   - 1.3 compare agricultural activities in rural and urban areas; e.g., scale of industry, labour requirements, type of commodity produced, market opportunities, degree of mechanization
   - 1.4 describe production and consumption patterns of agricultural products at local, national and international levels
   - 1.5 identify evolving and emerging forms of agriculture that have potential to provide aesthetic, emotional, economic and health benefits; e.g., food and textiles, industrial applications, greenhouse production, interior plantscape and landscape, animal husbandry and health care
   - 1.6 identify business/labour that provides inputs and services to agriculture
   - 1.7 describe the function of community services and government agencies serving agriculture
2. **demonstrate an understanding of the economic, environmental and social significance of agriculture**
   - 2.1 relate consumer needs and wants to a rationale for the exchange of agricultural goods and services at local, national and global levels
   - 2.2 describe the exchange of agricultural goods and services between Canada and other nations and describe the impact on the Canadian economy
   - 2.3 assess the environmental impact of agriculture; e.g., water management, waste management, crop production
   - 2.4 assess the impact of agriculture on quality of life factors; e.g., rural and urban development, sustainable food supply, use of national resources, lifestyle
   - 2.5 define sustainable agricultural production
   - 2.6 explain the importance of sustainable production systems in meeting societal needs for food, conserving natural resources and enhancing the quality of the environment
   - 2.7 assess the impact of choices and decisions made by citizens on the agriculture industry; e.g., selection of foods and textiles, use of land and/or chemicals, concern for animal welfare, support given to development and research
   - 2.8 assess the impact of inputs on agricultural practices; e.g., production/use of chemicals, cost of primary resources/chemicals/machinery

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

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

4.2 create a connection between a personal inventory and occupational choices

COURSE AGR1040: INTRODUCTION TO ANIMAL BASICS

Level: Introductory

Prerequisite: None

Description: Students learn to identify and demonstrate the basic steps involved in raising and caring for a domestic animal. Students gain an understanding of general care to ensure animal health.

Outcomes: The student will:

1. **demonstrate an understanding of the processes and procedures involved in caring for a domestic animal**
   - 1.1 differentiate among livestock, performance and companion animals; e.g., dairy cattle, horses, dogs
   - 1.2 identify and describe the basic physical needs of a domestic animal, including:
     - 1.2.1 water requirements
     - 1.2.2 light intensity and duration
     - 1.2.3 climate and temperature
     - 1.2.4 air/ventilation
     - 1.2.5 space variables
     - 1.2.6 nutrient requirements
   - 1.3 describe a strategy for protecting the health of the animal, including:
     - 1.3.1 taking of vital signs and knowing what is "normal"
     - 1.3.2 identification of diseases, deficiencies and ailments
     - 1.3.3 treatment, control and prevention
   - 1.4 describe municipal, provincial and federal laws related to the ethical and legal care of domestic animals
   - 1.5 relate concepts of breeding and selection to production practices; e.g., systems of breeding, selection criteria, genetic engineering
   - 1.6 describe buildings/structures and equipment appropriate to caring for the animal, considering:
     - 1.6.1 design features
     - 1.6.2 operation and maintenance
     - 1.6.3 safety
     - 1.6.4 economics/cost
2. **demonstrate an understanding of safety practices and risk management involved in working with a domestic animal**
   - 2.1 identify and discuss the potential hazards in caring for a domestic animal, including:
     - 2.1.1 moving the animal
     - 2.1.2 restraining the animal
     - 2.1.3 humane handling
     - 2.1.4 safe transportation of the animal
     - 2.1.5 health signs that indicate the need for professional veterinary care
     - 2.1.6 zoonotic diseases
     - 2.1.7 bites, scratches and allergies
   - 2.2 specify measures needed to avoid hazards

2.3 describe the warning signs of a threatened animal
2.4 describe the appropriate way to care for an animal, considering:
    2.4.1 approaching the animal
    2.4.2 moving the animal
    2.4.3 restraining the animal
    2.4.4 transporting the animal
    2.4.5 health signs that indicate the need for professional veterinary care
    2.4.6 methods for handling injuries and allergies
2.5 identify and describe common practices/equipment that should be used around animals

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

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

COURSE AGR1050: PLANT PROPAGATION

Level: Introductory

Prerequisite: None

Description: Students are introduced to plant structures and propagation techniques for growing healthy plants. Cultural requirements for plant production and technological and chemical influences on plant production are also explored.

Parameters: Access to a plant production facility and/or equipment.

Supporting Courses: AGR3000: Agriculture Safety
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. identify the processes and procedures involved in producing a plant commodity
- 1.1 differentiate among field crops, greenhouse/nursery productions and gardening
- 1.2 select seeds or plants appropriate to climatic conditions by:
  - 1.2.1 identifying selection processes; e.g., heritage seeds, hybrids
  - 1.2.2 identifying resources for product selection; e.g., catalogues, companies, online resources
  - 1.2.3 identifying plants, using common breeds/varieties/names
- 1.3 identify the structure and function of basic plant parts, including:
  - 1.3.1 roots; e.g., taproot, lateral roots, root hairs
  - 1.3.2 stems; e.g., xylem, phloem
  - 1.3.3 leaves; e.g., nodes, petioles, stomata
  - 1.3.4 flowers; e.g., pistils, stamens, sepals
  - 1.3.5 fruit; e.g., simple, aggregate, multiple
  - 1.3.6 seeds; e.g., embryo, endosperm, seed coat
- 1.4 relate the processes of photosynthesis, respiration and transpiration by:
  - 1.4.1 illustrating the formulas for photosynthesis and respiration
  - 1.4.2 identifying the relationship between photosynthesis and respiration
  - 1.4.3 developing an awareness of transpiration and its effects on plant health
- 1.5 describe cultural requirements for the production of a plant commodity, including:
  - 1.5.1 water requirements
  - 1.5.2 light intensity and duration
  - 1.5.3 climate and temperature
  - 1.5.4 air/ventilation
  - 1.5.5 space variable
  - 1.5.6 nutrient requirements
- 1.6 analyze the components of various types of soil and/or growing media; e.g., peat moss, perlite, vermiculite, sand, water
- 1.7 research the components and functions of fertilizers

2. relate the concepts of breeding, propagation and selection to production practices
- 2.1 identify and describe various forms of plant breeding
- 2.2 relate the selection of criteria to breeding and propagation; e.g., natural selection, hybrid breeding, plant cell culture

2.3 discuss the practice of genetic modification, including issues and concerns; e.g., nutritional value, ecological impact
2.4 research sexual and asexual propagation and identify plants suitable for each
2.5 demonstrate various methods of propagation; e.g., sowing, stem cutting, leaf cutting, division

3. describe technological systems used in a plant production enterprise

3.1 describe buildings/structures appropriate to production, considering:
- 3.1.1 design features
- 3.1.2 operation and maintenance
- 3.1.3 safety
- 3.1.4 economics/cost

3.2 describe equipment appropriate to production, considering:
- 3.2.1 operation and maintenance
- 3.2.2 safety
- 3.2.3 economics/cost

4. identify and describe potential hazards found in the plant production area and safe practices for dealing with hazards

4.1 identify and describe potential hazards related to chemicals used within the industry by:
- 4.1.1 identifying chemical hazard symbols
- 4.1.2 explaining the principal routes of entry of chemicals into the body
- 4.1.3 listing symptoms of exposure to chemicals
- 4.1.4 determining appropriate methods of storage for chemicals

4.2 identify and describe potential hazards related to tools/machinery used within the industry
4.3 identify and describe the types of personal protective equipment (PPE) that can be used; e.g., earplugs, gloves, masks
4.4 identify other methods of protection that can be used; e.g., lifting, loading, bending

5. identify and demonstrate various methods of planting, growing and harvesting a plant

5.1 select a plant/crop
5.2 identify the needs of the specific plant/crop selected; e.g., water requirements, light intensity and duration, type of soil
5.3 prepare a growing media for the plant/crop
5.4 choose an appropriate container for the plant/crop
5.5 use an appropriate method of propagation
5.6 maintain the plant/crop by providing optimum conditions; e.g., air movement, temperature
5.7 practise methods of transplanting and potting up
5.8 discuss hardening off techniques
5.9 harvest the plant/crop in an appropriate manner
5.10 maintain a logbook of activities

6. describe a strategy for protecting the health of a chosen plant commodity

6.1 identify common diseases, pests, deficiencies and ailments of the plant
6.2 identify the treatment, control and prevention of diseases, pests, deficiencies and ailments
6.3 discuss the advantages and disadvantages of chemical and non-chemical methods of pest and disease control
6.4 discuss ethical concerns related to protecting the health of plants

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:
- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:
    7.2.1 demonstrate positive attitudes and behaviours
    7.2.2 be responsible
    7.2.3 be adaptable
    7.2.4 learn continuously
    7.2.5 work safely
7.3 demonstrate teamwork skills to:
    7.3.1 work with others
    7.3.2 participate in projects and tasks

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

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

COURSE AGR1055: GARDENING

Level: Introductory

Prerequisite: AGR1050: Plant Propagation

Description: Students learn about basic gardening and the need to consider regional climates, water availability and exposure to sunlight. Students have the opportunity to plan and design a garden that may thrive in Alberta.

Parameters: Access to an indoor/outdoor growing facility and/or materials.

Supporting Courses: AGR3000: Agriculture Safety
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. **build an awareness of the different types of gardens**
   - 1.1 define types of gardens; e.g., raised bed, community, container, hobby and commercial, organic
   - 1.2 research the requirements for establishing a garden; e.g., location, soil quality, water accessibility, structures
   - 1.3 research the advantages and disadvantages of organic gardening
2. **identify plants suitable for use in Alberta gardens**
   - 2.1 identify the factors that contribute to plant choice, including:
     - 2.1.1 zones
     - 2.1.2 climatic factors
     - 2.1.3 days to maturity
   - 2.2 identify 10 vegetables and/or fruits that are suitable for the Alberta climate
   - 2.3 identify 10 herbs and/or edible flowers that are suitable for the Alberta climate
   - 2.4 distinguish between annuals and perennials
   - 2.5 compare the structural characteristics of different varieties of a plant
   - 2.6 identify the edible and/or aromatic uses of plants; e.g., roots, stems, leaves, flowers, fruits, seeds, bulbs, tubers
   - 2.7 establish best practices for planting
3. **design a garden**
   - 3.1 choose and illustrate a garden of choice; e.g., organic, raised bed, shade, vegetable
   - 3.2 identify land location; e.g., sun versus shade requirements, soil conditions
   - 3.3 plan a layout; e.g., land orientation, size, walkways, spacing for ease of working/weeding
   - 3.4 identify plant varieties, considering:
     - 3.4.1 seed planting and growing times
     - 3.4.2 indoor planting times for seed flats
     - 3.4.3 appropriate care/planting
     - 3.4.4 last frost date
   - 3.5 identify planting methods (e.g., French, bedding plants), considering:
     - 3.5.1 how deep
     - 3.5.2 how far apart
     - 3.5.3 companion plants

4. demonstrate practical skills in performing basic gardening

4.1 demonstrate a variety of planting methods; e.g., seeding, transplanting, cold frame, raised bed, planting into landscape fabric
4.2 identify various weeds/insects found in gardens
4.3 identify possible plant diseases related to plants chosen for cultivation
4.4 demonstrate appropriate and safe methods for weed/pest management; e.g., organic, companion, chemical
4.5 describe the types and functions of basic hand tools and/or power equipment used in gardening; e.g., for seeding, cultivating, tilling, weeding
4.6 demonstrate safe use of basic hand tools and/or power equipment

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 AGR1070: LANDSCAPING 1

Level: Introductory

Prerequisite: None

Description: Students learn about the techniques used to perform basic landscape services, focusing attention on plant identification, equipment and supplies, and basic maintenance tasks.

Parameters: Access to a residential, recreational and/or roadside landscape and appropriate equipment and supplies. Facilities and equipment should permit students to perform practical tasks in basic landscape services; e.g., watering, corrective pruning, cultivation/mulching, weed control, installation/removal of plant material.

Supporting Courses: AGR3000: Agriculture Safety
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. identify plants suitable for use in Alberta landscapes

- 1.1 describe the general characteristics and functional uses of basic plant groups used in landscaping; e.g., trees, shrubs, ground covers and vines, flowers, turfgrasses
- 1.2 explain the criteria used to identify individual plant species, including:
  - 1.2.1 common name
  - 1.2.2 general characteristics; e.g., plant height and shape, leaf structure and colour, flower or fruit characteristic
  - 1.2.3 growth/habits
  - 1.2.4 functional use of plant groups
- 1.3 identify common tree, shrub, ground cover, flower and turfgrass species used for landscaping in Alberta by:
  - 1.3.1 identifying five deciduous trees
  - 1.3.2 identifying five coniferous woody plants
  - 1.3.3 identifying five annuals
  - 1.3.4 identifying five perennials
  - 1.3.5 identifying five turfgrass/ground cover species
- 1.4 identify the cultural requirements of common trees, shrubs, ground covers, flowers and turfgrasses, including:
  - 1.4.1 water requirements
  - 1.4.2 light intensity and durations
  - 1.4.3 soil requirements
  - 1.4.4 temperature
  - 1.4.5 nutrient requirements
  - 1.4.6 maintenance; e.g., pruning and/or trimming
- 1.5 distinguish between native and exotic trees, shrubs and ground covers
- 1.6 create a record/logbook of a variety of specimens found in the Alberta landscape

2. **identify weeds and pests common in the Alberta landscape**
   - 2.1 explain the criteria used to identify individual weed species, including:
     - 2.1.1 common name
     - 2.1.2 general characteristics
     - 2.1.3 growth/habits
   - 2.2 identify five weeds
   - 2.3 identify five pests
   - 2.4 discuss the advantages and disadvantages associated with the use of common pesticides/herbicides
   - 2.5 discuss practices for management of pests and weeds; e.g., biological, cultural, chemical, organic
3. **identify basic equipment, potential hazards and safety practices associated with landscaping**
   - 3.1 describe the functions of basic hand tools and/or power equipment used for landscape preparation/maintenance, considering tools/equipment for:
     - 3.1.1 planting and transplanting
     - 3.1.2 cultivating, weeding and aerating
     - 3.1.3 thatch removing and raking
   - 3.2 describe the safe use of basic hand tools and/or power equipment used for landscape preparation/maintenance, considering:
     - 3.2.1 safe practices and potential hazards
     - 3.2.2 safety labels and instructions
     - 3.2.3 government legislation and regulation
     - 3.2.4 first aid
   - 3.3 identify and describe potential hazards related to chemicals used within the industry by:
     - 3.3.1 identifying chemical hazard symbols
     - 3.3.2 explaining the principal routes of entry of chemicals into the body
     - 3.3.3 listing symptoms of exposure to chemicals
     - 3.3.4 determining appropriate methods of storage for chemicals
   - 3.4 identify and describe the types of personal protective equipment (PPE) that can be used; e.g., earplugs, gloves, masks
   - 3.5 identify other methods of protection that can be used; e.g., lifting, loading, bending
4. **demonstrate practical skills in performing basic landscape services**
   - 4.1 select an area in which to perform basic landscaping services
   - 4.2 identify the cultural requirements of the plants within this landscape or of the plants that are to be placed within this landscape
   - 4.3 demonstrate appropriate watering strategies for flower beds and woody plants; e.g., water conservation, run-off, drought tolerance
   - 4.4 perform basic landscape services; e.g., planting and transplanting, hardening off, cultivating, weeding, watering, aerating, removing thatch, raking, pruning
   - 4.5 demonstrate the safe use of chemicals, basic hand tools and/or power equipment in landscape preparation/maintenance
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 AGR1080: FLORAL DESIGN – MECHANICS

Level: Introductory

Prerequisite: None

Description: Students learn about the basic sanitary practices and mechanics involved in the initial stages of designing a simple floral arrangement.

Parameters: Access to a flower arrangement room with refrigeration, a source of water, adequate storage facilities and workbenches/table surfaces for flower arranging.

Outcomes: The student will:

1. **identify and explain the cultural requirements of cut flowers and foliage**
   - 1.1 research the history and development of floral design
   - 1.2 identify cut flowers and greenery commonly used in floral design, including:
     - 1.2.1 greenhouse/field-grown cut flowers
     - 1.2.2 imported cut flowers
     - 1.2.3 foliage and filler
2. **demonstrate appropriate care and handling of fresh cut flowers and foliage**
   - 2.1 describe techniques for the care of perishable floral materials, including:
     - 2.1.1 use of water and preservatives
     - 2.1.2 temperature and humidity control
     - 2.1.3 cleanliness and sanitation
     - 2.1.4 methods of packaging
   - 2.2 describe techniques used to condition fresh cut flowers and greenery for storage
3. **construct simple floral arrangements**
   - 3.1 describe and identify different construction materials used in floral design, including:
     - 3.1.1 wire, tape and adhesive
     - 3.1.2 ribbon
   - 3.2 demonstrate basic construction techniques used in floral design, including:
     - 3.2.1 wiring
     - 3.2.2 taping
     - 3.2.3 bow making
   - 3.3 construct the following:
     - 3.3.1 boutonniere or corsage
     - 3.3.2 rose bowl
     - 3.3.3 bud vase
     - 3.3.4 large vase
4. **identify and perform safe and sanitary practices**
   - 4.1 demonstrate proper handling, use and maintenance of all implements and tools
   - 4.2 apply universal precautions related to blood-borne pathogens; e.g., minor cuts, blood spills
   - 4.3 maintain a clean, sanitary, safe work area
   - 4.4 use all materials and products appropriately
   - 4.5 clean, sanitize and return implements and materials to a storage area after use
   - 4.6 dispose of waste materials in an environmentally safe manner

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 AGR1085: FLORAL DESIGN 1

Level: Introductory

Prerequisite: AGR1080: Floral Design – Mechanics

Description: Students learn how to care for and handle fresh cut flowers and foliage while constructing simple floral arrangements.

Parameters: Access to a flower arrangement room with refrigeration, a source of water, adequate storage facilities and workbenches/table surfaces for flower arranging.

Outcomes: The student will:

1. **demonstrate appropriate care and handling of fresh cut flowers and foliage**
   - 1.1 demonstrate proper handling and unpacking of fresh cut flowers and foliage
   - 1.2 demonstrate basic preparation of fresh cut flowers, including:
     - 1.2.1 conditioning and hydration
     - 1.2.2 storage
2. **construct simple symmetrical floral arrangements**
   - 2.1 describe different construction materials used in floral design; e.g., wire, tape, holding devices, containers
   - 2.2 select an appropriate container for a design
   - 2.3 demonstrate and apply basic design principles in constructing floral arrangements, considering:
     - 2.3.1 colour harmony
     - 2.3.2 composition
     - 2.3.3 balance and symmetry
     - 2.3.4 proportion and scale
   - 2.4 construct a variety of symmetrical arrangements (e.g., oval, triangle), including:
     - 2.4.1 illustrations and analyses of the arrangements for basic design principles
     - 2.4.2 cost analyses of the arrangements
3. **identify and perform safe and sanitary practices**
   - 3.1 demonstrate proper handling, use and maintenance of cutting implements
   - 3.2 apply universal precautions related to blood-borne pathogens; e.g., minor cuts, blood spills
   - 3.3 maintain a clean, sanitary, safe work area
   - 3.4 use all materials and products appropriately
   - 3.5 clean, sanitize and return implements and materials to a storage area after use
   - 3.6 dispose of waste materials in an environmentally safe manner
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 AGR1100: AGRICULTURE TECHNOLOGY

Level: Introductory

Prerequisite: None

Description: Students describe applications of science and technology within the agriculture or horticulture industry.

Parameters: Access to a construction/fabrication/mechanic's workshop, greenhouse and/or science laboratory.

Supporting Courses: CON1010: Construction Tools & Materials
FAB1010: Fabrication Tools & Materials
HCS2020: First Aid/CPR with AED

Outcomes: The student will:

1. **explain how science and technology influence the development of agricultural products, methods and services**
   - 1.1 explain technology as the application of knowledge gained from research to solve practical problems in agriculture
   - 1.2 identify and describe different types of science and technology used in agriculture; e.g., machines, planning/monitoring/management processes, new plant and animal species
   - 1.3 describe issues and/or conflicts resulting from the adoption of one or more technologies in agriculture; e.g., economic, political, environmental, health
2. **describe current applications of science and technology in agricultural production, processing and marketing**
   - 2.1 describe applications of science and technology in addressing specific plant production needs; e.g., seed bed preparation/soil fertility (zero till), planting/harvesting (air seeders), weed and pest control, plant propagation, maintaining soil moisture levels (hydroponics/irrigation), improved production and yields
   - 2.2 describe applications of science and technology in addressing specific needs within the livestock production industry; e.g., animal handling, animal transportation, animal housing, nutrition, health, waste management, breeding management, improved production and yields
   - 2.3 describe specific applications of science and technology in agricultural processing; e.g., processing systems, quality control (quality assurance [QA] program), pollution control, preserving perishable products, packaging and storage
   - 2.4 describe specific applications of science and technology in agricultural marketing; e.g., enterprise budgets, communication, advertising and promotion, commodity sales, product distribution
3. **design a simple technological system that addresses a current need within the agriculture or horticulture industry**
   - 3.1 identify a technological need within the agriculture or horticulture industry
   - 3.2 research the need; e.g., talk to others in order to clarify ideas, consider similar needs and how they were addressed and make reasoned judgements regarding design potential
   - 3.3 generate ideas and alternatives regarding a mechanical system and/or process that will address the need
   - 3.4 select the most appropriate alternative and design the technology

3.5 construct a drawing/model of the technology by following plans that have been established
3.6 assess the design process and technology outcomes in relation to:
    3.6.1 original needs and design intentions
    3.6.2 efficient use of resources
    3.6.3 human and environmental safety
3.7 identify possible improvements to the design process and/or technology outcomes

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 AGR1150: GREENHOUSE/NURSERY CROPS 1

Level: Introductory

Prerequisite: None

Description: Students apply concepts and processes related to growing a greenhouse crop, including plant anatomy and identification, growth requirements, physical structures and equipment, and production tasks.

Parameters: Access to a land laboratory and/or greenhouse and/or controlled growing environment with a suitable water source.

Access to instruction from an individual with a Pesticide Applicator/Dispenser Certificate is required.

Supporting Courses: AGR1050: Plant Propagation
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. identify and describe plants that are suited for greenhouse/nursery crop production
- 1.1 identify the biological factors that affect a crop, considering the structure, function and growth habits of plants; e.g., cells and tissues, roots, stems, leaves, flowers
- 1.2 identify the life cycle of a plant
- 1.3 determine the basic requirements for greenhouse/nursery crops, including:
  - 1.3.1 light
  - 1.3.2 water
  - 1.3.3 temperature
  - 1.3.4 air
  - 1.3.5 nutrition
  - 1.3.6 growing medium
- 1.4 describe how weather and climate may affect production activities; e.g., germination rates
- 1.5 explain basic plant processes and related terminology; e.g., water and nutrient intake, respiration, photosynthesis, transpiration
- 1.6 identify greenhouse and nursery plants, using:
  - 1.6.1 common names
  - 1.6.2 botanical names
- 1.7 identify plants that are suited to specific applications, considering:
  - 1.7.1 potted and bench-grown greenhouse crops
  - 1.7.2 soilless crops grown in Alberta greenhouses
  - 1.7.3 vegetable and fruit crops
  - 1.7.4 potted plant crops grown in Alberta
  - 1.7.5 specialty crops

2. apply principles of nutrition to production practices
- 2.1 identify the function of macronutrients and micronutrients
- 2.2 identify excesses and deficiencies of nutrients
- 2.3 identify differences among fertilizer types; e.g., soluble, granular, slow-release
- 2.4 explain the use of fertilizer applicators

3. **implement appropriate strategies for the treatment and prevention of pests, diseases and ailments that affect the health of plants; e.g., cultural, mechanical, biological, chemical**
4. **identify equipment and supplies used in growing facilities**
   - 4.1 describe criteria relevant to the selection of structures, equipment and supplies; e.g., ease of operation/maintenance, safety, cost, environmental impact
   - 4.2 explain appropriate structures in producing crops; e.g., fences, cold frames, greenhouses
   - 4.3 discuss and demonstrate the safe use of appropriate hand and/or power equipment and related supplies at each stage of production
   - 4.4 identify practices relevant to the use of structures, equipment and supplies; e.g., policy, legislation and safe practices
5. **perform practical tasks to demonstrate an understanding of plant production, including:**
   - 5.1 using an appropriate growing medium
   - 5.2 choosing propagation techniques; e.g., sexual, asexual
   - 5.3 transplanting
   - 5.4 fertilizing
   - 5.5 watering
   - 5.6 spacing
   - 5.7 monitoring pests and assisting in pest management
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. **make personal connections to the cluster content and processes to inform possible pathway choices**
   - 7.1 complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences
   - 7.2 create a connection between a personal inventory and occupational choices

COURSE AGR1910: AGR 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 AGR2010: DIVERSITY IN AGRICULTURE

Level: Intermediate

Prerequisite: None

Description: Students analyze a range of issues relevant to agriculture and food production and develop strategies for dealing with agricultural issues within a local and global context.

Parameters: Access to community and government agencies responsible for agricultural planning, research and resource management.

Outcomes: The student will:

1. **analyze a range of economic, environmental and social issues in agriculture**
   - 1.1 list and categorize concerns being expressed regarding a social, economic and environmental issue in agriculture; e.g., environmental impacts, nutritional or food safety concerns, social, political or economic factors, legal/ethical factors
   - 1.2 analyze a current issue in agriculture critically by:
     - 1.2.1 identifying conflicts among different stakeholder groups
     - 1.2.2 gathering information relevant to different sides of the issue
     - 1.2.3 considering the implications of adopting different alternatives
2. **compare and contrast issues that involve agriculture in Alberta and Canada with similar issues at a global level**
   - 2.1 relate a local social, economic and environmental issue in agriculture to a similar issue at the global level; e.g., world food distribution, carbon sequestration, nutraceuticals, zoonotic diseases
   - 2.2 compare statements made by scientists, different interest groups and the media regarding the issue
   - 2.3 describe costs and benefits associated with different approaches for dealing with the issue at local and global levels
3. **present a plan of action to address a complex issue in agriculture**
   - 3.1 identify and describe a complex issue in agriculture, assuming the role of one of the stakeholders
   - 3.2 clarify the issue and identify related perspectives
   - 3.3 develop a position and provide a rationale
   - 3.4 outline a personal plan of action
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 AGR2020: ANIMAL HUSBANDRY/WELFARE

Level: Intermediate

Prerequisites: AGR1040: Introduction to Animal Basics
AGR3000: Agriculture Safety

Description: Students apply the principles of animal science and health technology in providing care for a domestic animal.

Parameters: Access to a domestic animal and an appropriate animal housing/fencing structure.

Outcomes: The student will:

1. **differentiate among and discuss the classifications and breeds of domestic animals**
   - 1.1 identify and explain the advantages and disadvantages of owning a specific animal breed
   - 1.2 identify criteria to be considered when selecting an animal (e.g., companion animal, performance animal, livestock), including:
     - 1.2.1 type of animal
     - 1.2.2 breed
     - 1.2.3 gender
2. **identify and describe indicators of health in a domestic animal**
   - 2.1 research the history of the selected animal of choice
   - 2.2 identify and describe indicators of health in a selected domestic animal, considering:
     - 2.2.1 physical signs of good and poor health
     - 2.2.2 normal and abnormal vital signs
     - 2.2.3 symptoms of disease and parasites
   - 2.3 explain basic food requirements in specific situations; e.g., newborn, maintenance, growth or finishing, pregnant or lactating mothers, aging
   - 2.4 describe contributions of technology in current animal husbandry and health care practices, including:
     - 2.4.1 nutrition
     - 2.4.2 disease prevention and treatment
     - 2.4.3 reproduction
   - 2.5 describe normal/abnormal physiology and anatomy for a selected domestic animal
   - 2.6 describe normal/abnormal food sources and the impact of nutrient deficiencies on animal health
3. **explain factors that contribute to a healthy animal environment**
   - 3.1 describe characteristics of a healthy animal environment and conditions that can place an animal's health or safety at risk, considering:
     - 3.1.1 sanitation
     - 3.1.2 housing; e.g., kennel, cage and paddock management
     - 3.1.3 methods of restraint
   - 3.2 identify the shelter needs of a selected domestic animal
   - 3.3 maintain desirable handling, housing and fencing structures
4. **identify agents and sources of stress for animals and their implications for health**
   - 4.1 describe abnormal animal behaviour and practise intervention strategies for a sick animal, including:
     - 4.1.1 reducing stress
     - 4.1.2 administering emergency first aid
     - 4.1.3 treating/controlling diseases and other ailments
     - 4.1.4 administering medication

4.2 describe transportation-related sources of stress
4.3 describe veterinary services that are available and the protocol for accessing these services, including:
4.3.1 when to call
4.3.2 how to prepare

5. demonstrate practical skills in providing care for a domestic animal
5.1 demonstrate ethical behaviours in providing care for an animal; e.g., humane handling
5.2 monitor vital signs and examine for diseases, parasites and other common ailments through:
5.2.1 head-to-toe examination
5.2.2 grooming; e.g., regular brushing/bathing
5.2.3 care of feet/nails/hooves
5.2.4 dental care
5.3 identify appropriate birthing and newborn care
5.4 explain the importance of maintaining safe domestic and market-driven environments for animals

6. identify and describe legislation intended to address animal welfare
6.1 distinguish between animal welfare and animal rights
6.2 identify and describe organizations in the community that enforce animal protection legislation
6.3 identify federal and provincial laws related to animal protection
6.4 describe different perspectives regarding an issue in animal welfare, including:
6.4.1 ethical
6.4.2 legal
6.4.3 economic
6.4.4 social
6.5 outline a protocol for reporting an animal welfare issue

7. demonstrate basic competencies
7.1 demonstrate fundamental skills to:
7.1.1 communicate
7.1.2 manage information
7.1.3 use numbers
7.1.4 think and solve problems
7.2 demonstrate personal management skills to:
7.2.1 demonstrate positive attitudes and behaviours
7.2.2 be responsible
7.2.3 be adaptable
7.2.4 learn continuously
7.2.5 work safely
7.3 demonstrate teamwork skills to:
7.3.1 work with others
7.3.2 participate in projects and tasks

8. identify possible life roles related to the skills and content of this cluster
8.1 recognize and then analyze the opportunities and barriers in the immediate environment
8.2 identify potential resources to minimize barriers and maximize opportunities

COURSE AGR2030: FIELD CROPS 1

Level: Intermediate

Prerequisite: AGR3000: Agriculture Safety

Description: Students explore different field crop species in Alberta. Using basic equipment, students demonstrate practical skills in planting, growing and harvesting field crops.

Parameters: Access to a land laboratory. Facilities and equipment should permit students to perform practical skills in **two** or more areas of crop production; e.g., soil preparation, seeding/propagation, cultivation, irrigation, fertilizing, pest and disease control, harvesting.

Supporting Courses: AGR1050: Plant Propagation
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. identify and describe field crop species suited to Alberta climates
- 1.1 identify field crops grown in western Canada according to:
  - 1.1.1 common name
  - 1.1.2 general characteristics/growth habits
  - 1.1.3 basic structural parts
- 1.2 describe the structure, function and growth habits of field crop species and the significance of these characteristics to the producer, considering:
  - 1.2.1 cells and tissues
  - 1.2.2 roots
  - 1.2.3 stems
  - 1.2.4 leaves
  - 1.2.5 flowers and fruits
- 1.3 explain basic plant processes and related terminology, including:
  - 1.3.1 water and nutrient intake
  - 1.3.2 respiration
  - 1.3.3 photosynthesis
  - 1.3.4 transpiration
- 1.4 identify field crops that are suited to specific applications in Alberta; e.g., vegetable and fruit crops, pulse crops, oil seeds, specialty crops

2. identify and describe basic equipment used in crop production
- 2.1 identify types of equipment that are used at each stage of production; e.g., hand and/or power equipment used in seeding/planting, tillage, water/fertilizer application and harvesting
- 2.2 identify and describe criteria relevant to the selection and/or design of production equipment, including:
  - 2.2.1 function, operation and maintenance
  - 2.2.2 safety
  - 2.2.3 efficiency
  - 2.2.4 ethical, legal and environmental factors
  - 2.2.5 economics and cost
- 2.3 identify policy, legislation and safe practices relevant to the use of equipment and crop inputs

3. demonstrate practical skills in planting, growing and/or harvesting a field crop

- 3.1 identify basic cultural requirements for producing field crops, including:
  - 3.1.1 water
  - 3.1.2 light (quantity, quality, duration)
  - 3.1.3 temperature
  - 3.1.4 air
  - 3.1.5 space variables
  - 3.1.6 nutrients
- 3.2 describe how weather and climate may affect production activities
- 3.3 relate principles of nutrition to production practices, considering:
  - 3.3.1 the function and sources of essential nutrients
  - 3.3.2 the consequences of nutrient excesses and deficiencies
  - 3.3.3 fertilizer formulation
- 3.4 describe the symptoms, treatment and prevention of major pests, diseases and ailments that affect the health of plants, considering cultural, mechanical, biological and chemical methods of control
- 3.5 demonstrate safe use of equipment
- 3.6 perform basic field crop production activities; e.g., soil preparation, seeding/propagation, crop cultivation, irrigation/fertilization, pest/weed/disease control, harvesting

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 AGR2040: LIVESTOCK/POULTRY 1

Level: Intermediate

Prerequisite: AGR3000: Agriculture Safety

Description: Students explore different breeds of livestock, poultry or other animal commodities. Focusing on basic anatomy and physiology and the requirements for growing and finishing practices, students will consider the welfare of the animals and the technology available.

Parameters: Access to livestock, poultry or specialty animals and to appropriate animal housing and fencing structures. Potential areas of specialization include the production of cattle (beef or dairy), poultry, swine, sheep and diversified livestock (elk, bison and deer).

Supporting Courses: AGR1040: Introduction to Animal Basics
AGR2020: Animal Husbandry/Welfare

Outcomes: The student will:

1. **describe the basic anatomy, physiology and breeds of cattle (beef or dairy), sheep, swine, poultry or diversified livestock**
   - 1.1 examine major classes and breeds of commercial species by:
     - 1.1.1 describing the desirable characteristics of major classes and breeds
     - 1.1.2 identifying animal breeds that are suited to specific production and market applications
   - 1.2 describe the characteristics and function of major anatomical structures in livestock, poultry or diversified livestock
   - 1.3 explain vital life processes and related terminology; e.g., respiration, digestion, waste/excretion, growth, production
   - 1.4 identify basic physical requirements for producing livestock, poultry or diversified livestock, including:
     - 1.4.1 water and food
     - 1.4.2 light
     - 1.4.3 temperature
     - 1.4.4 air/ventilation
     - 1.4.5 space variables
   - 1.5 describe how weather and climate may affect production activities
   - 1.6 describe normal/abnormal feed sources and the impact of nutrient deficiencies on animal health
   - 1.7 describe common pests, diseases and ailments that affect the health of animals within the industry, considering:
     - 1.7.1 identification, symptoms and treatment
     - 1.7.2 cultural, mechanical, biological and chemical methods of control
   - 1.8 identify policy, legislation and safe practices relevant to raising livestock, poultry or specialty animals
2. **demonstrate practical skills in raising, growing and finishing cattle (beef or dairy), sheep, swine, poultry or diversified livestock**
   - 2.1 provide basic feed requirements in specific situations; e.g., maintenance, growth or finishing, pregnant or lactating mother
   - 2.2 demonstrate accepted methods of handling and restraining animals; e.g., humane handling, transportation

2.3 administer basic treatments for common pests, diseases and/or ailments; e.g., injections, dusting
2.4 clean and disinfect trailers, pens and other animal holding structures
2.5 operate equipment safely and maintain equipment used at each stage of production within the industry; e.g., hand and/or power equipment used in maintaining health and nutrition, handling equipment

3. explain factors that contribute to a healthy animal environment

3.1 describe housing and fencing structures used in producing livestock, poultry or specialty animals, including:
- 3.1.1 fences and shelters
- 3.1.2 totally confined rearing structures
- 3.1.3 methods of restraint

3.2 evaluate the design and/or construction of structures and equipment with respect to:
- 3.2.1 function, operation and maintenance
- 3.2.2 safety and efficiency
- 3.2.3 ethical, legal and environmental factors
- 3.2.4 economics and cost

3.3 identify policy, legislation and safe practices relevant to the use of structures and equipment within the industry

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 AGR2045: COMPANION ANIMALS

Level: Intermediate

Prerequisite: None

Description: Students explore the history, physiology, behaviour, health and welfare, care, and husbandry of a variety of companion animal species.

Supporting Course: HSS1100: Nature & Wellness

Outcomes: The student will:

1. **explain the origins of different companion animal species and the historical roles of these species in society**
   - 1.1 define *domestication*
   - 1.2 describe the history, purpose and process of domestication for:
     - 1.2.1 dogs
     - 1.2.2 cats
     - 1.2.3 other companion animals
   - 1.3 describe the early "jobs" of domesticated companion animals, considering:
     - 1.3.1 dogs—protection, herding, hunting, pest control, companionship
     - 1.3.2 cats—rodent control, hunting, companionship
     - 1.3.3 other companion animals—hunting, companionship
   - 1.4 explain the human–companion animal bond, including the contributions of companion animals to humans and society, such as:
     - 1.4.1 guide dogs
     - 1.4.2 service dogs; e.g., hearing dogs, assistance dogs, autism dogs, seizure-response dogs
     - 1.4.3 police/military dogs
     - 1.4.4 animals that provide therapeutic benefit to humans in a variety of settings
2. **analyze the breeds and specialized characteristics of dogs and cats**
   - 2.1 define the meaning of *animal breed*
   - 2.2 categorize dogs into the seven Canadian Kennel Club groups of dogs, including:
     - 2.2.1 sporting group
     - 2.2.2 hound group
     - 2.2.3 working group
     - 2.2.4 terrier group
     - 2.2.5 toy group
     - 2.2.6 non-sporting group
     - 2.2.7 herding group
   - 2.3 describe the historical jobs of dogs and the general physical and behavioural characteristics required by dogs to perform these roles for each of the seven Canadian Kennel Club categories
   - 2.4 categorize cats into the most commonly registered cat breeds in North America by identifying general physical and behavioural characteristics of the breeds
3. **explain the physiology of companion animals, including species/breed differences that have arisen due to the development of the breed to perform a specific job**
   - 3.1 describe the physiology of dogs, including:
     - 3.1.1 skeletal structure
     - 3.1.2 olfactory system

3.1.3 coat types
3.1.4 digestive system
3.1.5 reproduction
3.1.6 behaviour

3.2 describe the physiology of cats, including:
3.2.1 skeletal structure
3.2.2 coat types
3.2.3 digestive system
3.2.4 reproduction
3.2.5 behaviour

3.3 describe the physiology of birds (both Passeriformes and Psittaciformes), including:
3.3.1 digestive system
3.3.2 respiratory system
3.3.3 feathers
3.3.4 reproduction
3.3.5 behaviour

3.4 describe the physiology of rodents, rabbits and ferrets, including:
3.4.1 skeletal structure
3.4.2 digestive system
3.4.3 reproduction
3.4.4 behaviour

3.5 describe the physiology of reptiles and amphibians, including:
3.5.1 skin
3.5.2 digestive system
3.5.3 reproduction
3.5.4 behaviour

4. evaluate principles of companion animal care, husbandry and handling

4.1 justify the skills and knowledge needed for responsible pet ownership, including:
4.1.1 selecting and purchasing a companion animal
4.1.2 comparing reputable rescue organizations, breeders and pet stores as sources for obtaining a companion animal
4.1.3 topics to research before selecting and purchasing
4.1.4 spaying and neutering
4.1.5 use of controversial optional surgical procedures (ear cropping, tail docking, declawing)

4.2 describe municipal, provincial and federal laws regulating companion animal care and ownership/guardianship

4.3 identify similarities and differences in the physical and psychological needs of different species (dogs, cats, birds, rodents, ferrets, rabbits, reptiles and amphibians) and of breeds within those species (e.g., Newfoundland versus Chihuahuas), including:
4.3.1 safe housing
4.3.2 safety in the home—"pet proofing" a house
4.3.3 grooming
4.3.4 psychological requirements
4.3.5 exercise

4.4 explain the nutritional requirements of companion animals, including:
4.4.1 water
4.4.2 food
4.4.3 toxicological hazards
4.4.4 weight management—why this is important

4.5 describe important companion animal behaviours, using case studies and personal experiences, including signs of stress, fear and aggression for:
- 4.5.1 dogs
- 4.5.2 cats
- 4.5.3 birds
- 4.5.4 rodents, rabbits and ferrets
- 4.5.5 reptiles and amphibians

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 the immediate environment

6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE AGR2050: AGRIFOODS 1

Level: Intermediate

Prerequisite: None

Description: Students learn about the processes and practices related to producing an agrifood product or providing a related service, focusing on industry inputs and processing technologies and practices.

Parameters: Access to an agrifood industry. Potential areas of investigation include dairy, beef, pork, poultry, cereals, oil seeds, sugar beets, wine, fruits/vegetables and honey.

Supporting Courses: FOD1010: Food Basics
FOD1070: Farm to Table
MAM1050: Agriculture Consumer Products & Services

Outcomes: The student will:

1. **describe the range of input materials, food products and/or related services characteristic of an agrifood industry**
   - 1.1 explain the stages and steps in processing the commodity and providing the value-added product and/or service
   - 1.2 explain applications of technology in processing the commodity and providing the value-added product and/or service
   - 1.3 explain the need for quality control within the processing industry, including:
     - 1.3.1 testing/inspection of raw materials
     - 1.3.2 product quality and uniformity
   - 1.4 explore and describe systems used to grade products within the industry
2. **describe technologies and practices used in processing an agricultural food product or in providing a related service**
   - 2.1 describe methods of preserving perishable products within the industry; e.g., blanching and canning, dehydration and freeze-drying, fermentation, refrigeration and freezing, atmosphere control, food additives
   - 2.2 describe packaging and labelling practices within the industry
   - 2.3 describe transportation and storage practices within the industry and describe their impact on industry location and product costs
   - 2.4 describe buildings/structures and equipment used in processing, transportation and storage; e.g., design features, operation and maintenance, safety standards, economics/cost
   - 2.5 identify safety concerns, regulations and legislated standards within the industry; e.g., handling of tools, equipment, food products
   - 2.6 discuss the use of time and resources as they apply to producing an agrifood product or service
   - 2.7 demonstrate skills and techniques for the safe and sanitary handling of tools, equipment and food products and for the efficient use of time and resources
3. **develop a plan for altering an existing agricultural or horticultural product or for developing a new product**
   - 3.1 identify the agricultural or horticultural commodity, product or service to be marketed
   - 3.2 research local, national and international markets for the agricultural or horticultural commodity, product or service

3.3 identify factors that influence consumer trends and the development of new markets for an agricultural or horticultural product; e.g., economic, environmental, social and demographic
3.4 prepare a flowchart that illustrates basic stages and steps in processing an agricultural or horticultural product

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 AGR2060: LANDSCAPING 2

Level: Intermediate

Prerequisite: AGR1070: Landscaping 1

Description: Students demonstrate basic landscape practices, focusing attention on plant identification, weed/pest control and equipment maintenance.

Parameters: Access to a residential, recreational and/or roadside landscape and appropriate equipment and supplies. Facilities and equipment should permit students to perform practical tasks in basic landscape services; e.g., watering, cultivation/mulching, corrective pruning, weed control, installation/removal of plant material.

Supporting Courses: AGR3000: Agriculture Safety
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. identify plants suitable for use in Alberta landscapes
- 1.1 describe methods of identifying landscape plants, including:
  - 1.1.1 using common names
  - 1.1.2 using botanical nomenclature
- 1.2 identify five deciduous and five coniferous woody plants suitable for use in Alberta landscapes according to:
  - 1.2.1 common name and genus
  - 1.2.2 general characteristics/growth habits
  - 1.2.3 functional use in Alberta landscapes
- 1.3 identify five selected annuals according to:
  - 1.3.1 common name and variety
  - 1.3.2 general characteristics/growth habits
  - 1.3.3 functional use in Alberta landscapes
- 1.4 identify five selected perennials according to:
  - 1.4.1 common name and variety
  - 1.4.2 general characteristics/growth habits
  - 1.4.3 functional use in Alberta landscapes
- 1.5 identify five selected bulbs, tubers and rhizomes according to:
  - 1.5.1 common name and variety
  - 1.5.2 general characteristics/growth habits
  - 1.5.3 functional use in Alberta landscapes

2. identify weeds/pests commonly found in the Alberta landscape
- 2.1 identify five selected weeds/pests according to:
  - 2.1.1 common name
  - 2.1.2 general characteristics/growth habits
- 2.2 compare methods used to control these weeds/pests

3. demonstrate the safe use of hand tools and/or power equipment
- 3.1 demonstrate safe practices and identify potential hazards
- 3.2 prepare equipment for use; e.g., add gas, check oil, check tires

4. perform routine maintenance of hand tools and/or power equipment used for landscaping

4.1 perform safety checks on equipment

4.2 record/report general maintenance and/or malfunctions; e.g., hours of operation, periodic servicing

4.3 prepare basic hand tools/power equipment for off-season storage; e.g., cleaning

5. demonstrate proper landscape procedures

5.1 explain how environmental conditions affect plant survival; e.g., zones, wind, drought

5.2 apply seasonal landscaping maintenance practices; e.g., weeding, transplanting, preparing beds, staking, pest control, mulching

5.3 investigate the benefits of pruning trees, shrubs and other landscape plants

5.4 discuss composting and its benefits

5.5 maintain a logbook of landscape gardening activities

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 AGR2070: EQUINE 1

Level: Intermediate

Prerequisite: AGR3000: Agriculture Safety

Description: Students develop practical skills, based on approved practices, for providing the daily care of a horse, focusing on the origin and history of horses, anatomy and conformation, types and breeds, handling and feeding practices, and basic health care.

Parameters: Access to a horse and appropriate equine housing/fencing structures.

It is recommended that students have a **minimum of 50 hours** of previous experience in horse handling and horse care prior to commencing the study of this course. Students must have access to instruction from an individual with specialized training and/or experience related to horsemanship and/or English or Western riding.

Supporting Courses: AGR1040: Introduction to Animal Basics
AGR2020: Animal Husbandry/Welfare

Outcomes: The student will:

1. **describe the significance, origin and conformational features of horses**
   - 1.1 describe the origin and history of horses and factors that led to domestication
   - 1.2 identify different types of benefits associated with horses, including:
     - 1.2.1 pleasure
     - 1.2.2 companionship
     - 1.2.3 performance
     - 1.2.4 breeding
   - 1.3 identify and describe the characteristics and functions of basic external parts of a horse
   - 1.4 analyze and explain conformational features of major body parts, including:
     - 1.4.1 the head and neck
     - 1.4.2 the fore limbs and hind limbs
   - 1.5 identify factors determining a horse's balance
2. **identify the types, breeds and characteristics of horses**
   - 2.1 identify and describe the distinguishing characteristics of draft horses and light horses
   - 2.2 identify breeds of draft and light horses that are suited to specific applications
   - 2.3 explain how characteristics of the horse are passed from generation to generation through commonly used breeding systems, including:
     - 2.3.1 inbreeding
     - 2.3.2 line breeding
     - 2.3.3 crossbreeding
   - 2.4 explain principles of heredity relevant to a specific breed of horse, including:
     - 2.4.1 dominant and recessive traits
     - 2.4.2 selection criteria and procedures
3. **demonstrate practical skills and approved procedures for horse handling, feeding and health care**
   - 3.1 apply ethical behaviour in providing care for a horse

3.2 identify environmental factors that need to be considered in providing care for a horse, including:
    3.2.1 weather and climate
    3.2.2 land, soil and water characteristics
3.3 demonstrate appropriate techniques for handling a horse and for risk management, including:
    3.3.1 approaching a horse
    3.3.2 leading a horse
    3.3.3 cleaning a horse's feet
    3.3.4 grooming a horse
    3.3.5 tying a horse
    3.3.6 restraining a horse
    3.3.7 transporting a horse
    3.3.8 treating horse injuries and allergies
3.4 perform approved horse-feeding practices by providing:
    3.4.1 water
    3.4.2 roughage
    3.4.3 concentrate; e.g., minerals
3.5 describe the importance of a regular feeding schedule
3.6 monitor and assess the vital signs of a horse, recognizing abnormalities
3.7 demonstrate appropriate care for leg wounds on a horse
3.8 describe appropriate care of a horse with:
    3.8.1 colic
    3.8.2 respiratory disease
    3.8.3 founder (laminitis)
3.9 identify health factors that indicate the need for veterinary services

4. describe policy, legislation and safe practices relevant to providing horse care

4.1 identify and describe legislation intended to address animal welfare
4.2 identify and describe organizations in the community that address animal welfare
4.3 compare different perspectives regarding an issue in animal welfare; e.g., social, economic, ethical
4.4 outline a protocol for responding to an animal welfare issue

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 the immediate environment
6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE AGR2085: FLORAL DESIGN 2

Level: Intermediate

Prerequisite: AGR1085: Floral Design 1

Description: Students study the handling requirements of flowers and foliage and the practices involved in providing floral design. Student attention will focus on plant and flower identification, elements and principles of design, floral projects and marketing practices.

Parameters: Access to a flower arrangement room with refrigeration, a source of water, adequate storage facilities and workbenches/table surfaces for flower arranging.

Outcomes: The student will:

1. **identify and explain the handling requirements of flowers and foliage used in arrangements**
   - 1.1 identify cut flowers and greenery commonly used in floral design, including:
     - 1.1.1 greenhouse or field-grown cut flowers
     - 1.1.2 imported cut flowers
     - 1.1.3 foliage and filler
   - 1.2 identify dried and artificial materials commonly used in floral design, including:
     - 1.2.1 dried flowers and foliage
     - 1.2.2 silk and other fabric materials
   - 1.3 relate the growth styles of flowers to their use in floral arrangements
   - 1.4 explain the advantages and disadvantages of using different types of floral materials
2. **construct fresh, dried and/or artificial floral arrangements**
   - 2.1 explain and apply elements and principles of design, including:
     - 2.1.1 line, form, pattern and texture
     - 2.1.2 colour, balance and rhythm
     - 2.1.3 scale and proportion
     - 2.1.4 harmony, contrast and repetition
   - 2.2 apply the colour wheel and basic colour theory
   - 2.3 demonstrate asymmetrical design techniques
   - 2.4 demonstrate bundling techniques
   - 2.5 create a hand-tied bouquet
3. **explain techniques used to assess the cost of products within the floral industry**
   - 3.1 identify fixed and variable costs associated with floral services
   - 3.2 explain and apply pricing formulas used in the floral industry
   - 3.3 calculate the cost price and selling price of a floral arrangement
4. **identify and perform safe and sanitary practices**
   - 4.1 demonstrate proper handling, use and maintenance of all implements and tools
   - 4.2 apply universal precautions related to blood-borne pathogens; e.g., minor cuts, blood spills
   - 4.3 maintain a clean, sanitary, safe work area
   - 4.4 use all materials and products appropriately
   - 4.5 clean, sanitize and return implements and materials to a storage area after use
   - 4.6 dispose of waste materials in an environmentally safe manner

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 the immediate environment

6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE AGR2095: INDOOR PLANTS

Level: Intermediate

Prerequisite: AGR1050: Plant Propagation

Description: Students study the practices involved in interiorscaping, focusing attention on plant identification and the care required for maintaining the health of indoor plants.

Parameters: Access to appropriate equipment that will sustain plant health.

Outcomes: The student will:

1. identify and explain the cultural requirements of interior plants
- 1.1 identify interior plants by both botanical and common name, including:
  - 1.1.1 tropical flowering plants
  - 1.1.2 foliage plants
- 1.2 compare similar family traits
- 1.3 explain the cultural requirements of interior plants, including:
  - 1.3.1 light intensity and duration; e.g., low, medium, high, very high
  - 1.3.2 water; e.g., dry, moist, wet
  - 1.3.3 growing medium/soil condition
  - 1.3.4 temperature and humidity
  - 1.3.5 nutrition; e.g., general rate, low, medium, high

2. develop and apply an understanding of interiorscaping
- 2.1 assess the placement of indoor plants by applying knowledge of their cultural requirements
- 2.2 identify and explain sources of environmental stress for indoor plants, including:
  - 2.2.1 central heating systems
  - 2.2.2 air conditioning

3. demonstrate diagnostic skills regarding common plant problems
- 3.1 assess a root system for colour and shape
- 3.2 assess watering and drainage; e.g., size/type of pot
- 3.3 check humidity level; e.g., colour of leaves, wilting, drying of growing tips
- 3.4 determine lighting conditions and placement of plants; e.g., shape of plant, sunburn through windows
- 3.5 determine the type of growing medium/soil used
- 3.6 investigate the types of fertilizers/growth stimulants used
- 3.7 assess plants for damage from pests, diseases and other disorders
- 3.8 identify plants that could potentially be a human health risk; e.g., poisonous

4. demonstrate safe practices regarding chemical use on indoor plants
- 4.1 recognize WHMIS symbols
- 4.2 identify and describe appropriate techniques when dealing with pesticides and fertilizers, considering:
  - 4.2.1 handling and storage
  - 4.2.2 mixing
  - 4.2.3 application
  - 4.2.4 disposal
- 4.3 identify and compare organic and inorganic chemicals

4.4 identify additional products available in the marketplace, considering:
    4.4.1 purpose
    4.4.2 safety
    4.4.3 disposal

5. design and create a living arrangement

5.1 identify common growth requirements
5.2 explain and apply elements and principles of design, including:
    5.2.1 line, form, pattern and texture
    5.2.2 colour, balance and rhythm
    5.2.3 scale and proportion
    5.2.4 harmony, contrast and repetition
5.3 apply the colour wheel and basic colour theory
5.4 compose an indoor plantscape according to design principles; e.g., colour, line, foliage
5.5 plan and establish a living arrangement, using design principles; e.g., terrarium, dish garden, gift pan

6. implement a maintenance routine for an indoor plantscape

6.1 determine the type of indoor plantscape that will be cared for
6.2 develop a logbook/chart to record plant maintenance, including:
    6.2.1 potting/repotting
    6.2.2 the adjustment/regulation of light and water on a routine basis
    6.2.3 monitoring and management of pests
    6.2.4 implementation of a fertilization routine
    6.2.5 pruning and removal of waste material in an environmentally appropriate manner
6.3 assess the maintenance routine

7. identify and perform safe and sanitary practices

7.1 demonstrate proper handling, use and maintenance of all implements and tools
7.2 apply universal precautions related to blood-borne pathogens; e.g., minor cuts, blood spills
7.3 maintain a clean, sanitary, safe work area
7.4 use all materials and products appropriately
7.5 clean, sanitize and return implements and materials to a storage area after use
7.6 dispose of waste materials in an environmentally safe manner

8. demonstrate basic competencies

8.1 demonstrate fundamental skills to:
    8.1.1 communicate
    8.1.2 manage information
    8.1.3 use numbers
    8.1.4 think and solve problems
8.2 demonstrate personal management skills to:
    8.2.1 demonstrate positive attitudes and behaviours
    8.2.2 be responsible
    8.2.3 be adaptable
    8.2.4 learn continuously
    8.2.5 work safely
8.3 demonstrate teamwork skills to:
    8.3.1 work with others
    8.3.2 participate in projects and tasks

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

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

COURSE AGR2100: PROTECTIVE ENCLOSURES

Level: Intermediate

Prerequisite: None

Description: Students identify essential components of a growing/living environment and demonstrate the techniques used to manage the growing/living environment within a protective enclosure.

Parameters: Access to a greenhouse structure or livestock/poultry enclosure.

Outcomes: The student will:

1. **identify and explain essential components of controlled growing/living environments**
   - 1.1 define and give examples of controlled growing environments
   - 1.2 describe environmental components that are commonly controlled in protective enclosures; e.g., temperature, humidity, light intensity, atmosphere
   - 1.3 explain how specific problems in agricultural production are solved through environmental control
   - 1.4 describe control systems and technologies used to maintain temperature, humidity, light and atmospheric gases at specific levels
   - 1.5 describe methods of maintaining sanitation and reducing/minimizing contaminants
   - 1.6 identify utility/service requirements and energy conservation methods for a controlled growing environment
2. **describe ways in which controlled growing/living environments can be adapted for crop production or livestock housing**
   - 2.1 explain applications of controlled growing environments in crop or livestock production; e.g., temperature, light, humidity and atmosphere control systems, feed and watering systems, sanitation and health practices
   - 2.2 prepare a design for environmental control that addresses one or more problems in a crop or livestock production venture; e.g., identify production problems caused by environmental factors, design structures and equipment that address production problems through partial or complete control of the growing environment, prepare accurate working drawings and/or models of the production facility
   - 2.3 identify benefits and problems resulting from the use of protective enclosures in crop or livestock production
3. **demonstrate techniques used to regulate and manage growing environments within a protective enclosure**
   - 3.1 identify safety hazards and demonstrate safe practices while performing production tasks within a protective enclosure
   - 3.2 regulate and manage the growing environment for a designated crop or livestock species; e.g., operate control systems to maintain temperature, humidity and ventilation at proper levels, operate artificial lighting and shade-control mechanisms to maintain proper light intensity, regulate watering and feeding systems to ensure nutritional requirements are met
   - 3.3 maintain a daily log that details activities regarding production and/or facility management
   - 3.4 demonstrate appropriate sanitation and health practices within a protective enclosure; e.g., manage/control diseases and pests, dispose of waste material
   - 3.5 perform routine maintenance services and repairs to protective enclosures

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 AGR2120: SOILS MANAGEMENT 1

Level: Intermediate

Prerequisite: AGR1050: Plant Propagation

Description: Students examine soil structure, conduct tests to determine the physical and chemical properties of soils, and develop an understanding of the impact of soil properties on productivity.

Parameters: Access to a science laboratory and/or equipment and a variety of soil samples.

Outcomes: The student will:

1. **describe the origin and composition of soils in Alberta**
   - 1.1 identify and describe factors that influence the formation of different kinds of soils; e.g., climate, living organisms, bedrock, topography, time
   - 1.2 relate soil quality to the farming industry in an area
   - 1.3 describe the major components of soil and their relationship to soil productivity; e.g., minerals, organic matter, air, water
   - 1.4 discuss the soil orders of the Canadian System of Soil Classification; e.g., distinguishing characteristics, typical horizon sequences
2. **identify physical properties of soils and describe their relationship to soil productivity**
   - 2.1 define soil texture and describe textural classes of soil
   - 2.2 apply hand-texturing techniques to estimate the texture of a soil sample; e.g., moist cast test, ribbon test
   - 2.3 define soil structure and describe factors that influence the formation of soil structure
   - 2.4 identify different types of soil structures and relate soil structure to common soil horizons
   - 2.5 explain the significance of colour as an indicator of soil conditions and identify descriptors used to indicate soil colour
   - 2.6 interpret relationships between physical properties of soil and plant growth
3. **identify chemical properties of soils and describe their relationship to soil productivity**
   - 3.1 describe the nature and development of acidic and alkaline soils
   - 3.2 define and measure soil reaction (pH)
   - 3.3 describe the effect of soil pH on plant growth and describe methods of adjusting soil pH
   - 3.4 discuss the origin and characteristics of saline soils
   - 3.5 describe the effect of soil salinity on plant growth and describe strategies for managing saline soils
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 AGR2130: INTEGRATED PEST MANAGEMENT

Level: Intermediate

Prerequisite: None

Description: Students identify pests and apply knowledge of pest management within the agriculture industry.

Parameters: Access to a horticultural or an agricultural production area.

Access to instruction from an individual with a Pesticide Applicator/Dispenser Certificate is required.

Supporting Courses: AGR3000: Agriculture Safety
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. **describe the life cycle and ecology of common pests within the agriculture industry**
   - 1.1 define pests and describe specific pest problems within the agriculture industry
   - 1.2 explain the benefits of pest management
   - 1.3 describe the biology and life cycles of major groups of pests; e.g., weeds, insects, diseases, vertebrates
   - 1.4 identify and classify a range of common pests; e.g., mites, ticks, birds, fungi, weeds, insects, rodents
   - 1.5 explain the interrelatedness of common pests with ecosystems and environments; e.g., relationship of soil, water and air characteristics to plant/animal health, food webs and energy chains, environmental factors that limit populations
2. **describe biological, cultural and chemical pest-control strategies and basic principles of integrated pest management**
   - 2.1 explain basic principles of biological pest control and give examples of beneficial organisms used to control pest populations; e.g., predators, parasites, pathogens
   - 2.2 explain basic principles of cultural pest control and give examples of cultural practices used to control pest populations; e.g., soil tillage, crop rotation
   - 2.3 explain basic principles of chemical pest control
   - 2.4 provide examples of chemical families and pesticide formulations used to control pest populations and discuss the importance of rotating chemical groups to avoid pest tolerance
   - 2.5 describe and give examples of physical and mechanical pest-control strategies
   - 2.6 explain genetic resistance
   - 2.7 discuss the role of breeding programs in developing organisms that have genetic resistance to pests
   - 2.8 define and give reasons for the development of integrated pest management; e.g., management versus control perspective, environmental human health concerns
   - 2.9 explain the basic principles and strategies of integrated pest management; e.g., identification of key parts, biology of crop/host and its ecosystem, ecosystem manipulation, economic threshold levels, pest sampling and monitoring
   - 2.10 cite benefits and problems related to the use of integrated pest management as a pest-control strategy

3. **explain legislation and policies regarding the safe handling, storage and use of chemical and biological control agents**
   - 3.1 investigate regulatory bodies and legislation established to assist pest-control programs
   - 3.2 explain safe techniques in pesticide/herbicide application; e.g., use of equipment and supplies, mixing and application techniques, clean-up and disposal
   - 3.3 describe the impact of pest-control practices on human and environmental health
4. **develop and implement an integrated pest management program**
   - 4.1 identify specific pest problems within the industry
   - 4.2 perform pest sampling and monitoring procedures in order to determine the presence of pests, their stage of development and the nature/extent of damage caused
   - 4.3 identify threshold levels that determine when pest control measures should be implemented
   - 4.4 identify and apply pest management procedures that are based upon relevant aspects of pest/host biology and the ecosystem
   - 4.5 participate in monitoring and identifying pests within a defined area; e.g., garden, greenhouse, field crop
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 the immediate environment
   - 6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE AGR2150: GREENHOUSE/NURSERY CROPS 2

Level: Intermediate

Prerequisite: AGR1150: Greenhouse/Nursery Crops 1

Description: Students identify suitable greenhouse crops, demonstrate understanding of growth requirements and necessary physical structures and equipment, and engage in practical production tasks.

Parameters: Access to a land laboratory and/or controlled growing environment.

Access to instruction from an individual with a Pesticide Applicator/Dispenser Certificate is required.

Supporting Courses: AGR1050: Plant Propagation
AGR3000: Agriculture Safety
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. **identify and describe greenhouse plants suited to Alberta climates**
   - 1.1 identify seasonal crops grown in Alberta greenhouses; e.g., poinsettias, bedding plants, Easter lilies, hydrangeas
   - 1.2 evaluate and assist in the selection of plant material
   - 1.3 determine the growth requirements of a crop by:
     - 1.3.1 assessing a time line and participating in a scheduling process
     - 1.3.2 evaluating cultural requirements; e.g., soil medium, light, water, fertilizer, spacing
2. **apply principles of nutrition to production practices**
   - 2.1 review the functions of micronutrients and macronutrients
   - 2.2 identify excesses and deficiencies of nutrients
   - 2.3 discuss fertilizer formulations
   - 2.4 determine the pH and electroconductivity (EC) levels of soil
   - 2.5 assist with the application of necessary nutrients
3. **select and apply equipment and structures used in greenhouse crop production**
   - 3.1 determine the function and safe use of hand tools; e.g., dibber stick, sifters, secateurs
   - 3.2 determine the function and appropriate use of structures; e.g., benches, cold frames, watering systems, shading
4. **demonstrate practical skills in growing a greenhouse crop**
   - 4.1 prepare a growing medium/seed bed
   - 4.2 use appropriate methods of propagation (sexual/asexual)
   - 4.3 complete transplanting of plants as scheduled
   - 4.4 apply appropriate crop cultivation techniques; e.g., deadheading, weeding, pinching, thinning
   - 4.5 use appropriate watering and fertilizing techniques
   - 4.6 control plant pests and diseases, using nontoxic and safe material
   - 4.7 maintain an anecdotal record/logbook of production tasks

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 the immediate environment

6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE AGR2910: AGR 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 AGR2920: AGR 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 AGR2950: AGR 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 AGR3000: AGRICULTURE SAFETY

Level: Advanced

Prerequisite: None

Description: Students recognize and assess the hazards and manage the risks of working in agriculture.

Parameters: Access to appropriate agricultural facilities and/or equipment.

Supporting Courses: AGR1010: Introduction to Agriculture
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Other Resources: Alberta Labour: Resources for the Classroom

Outcomes: The student will:

1. identify and describe potential hazards found in the agricultural area
- 1.1 predict hazards within an agricultural environment; e.g., farm, ranch
- 1.2 research the different types of hazards (e.g., chemical, physical, ergonomic, biological, psychosocial) and provide examples of each in an agricultural home or environment
- 1.3 describe the major hazards related to farm machinery; e.g., pinch points, wrap points, shear points, pull-in points, crush points
- 1.4 describe potential hazards related to animal management by:
  - 1.4.1 listing the most common injuries that occur around animals
  - 1.4.2 identifying and describing the warning signs of a threatened animal
  - 1.4.3 identifying and describing the appropriate way to approach an animal
  - 1.4.4 describing and demonstrating the appropriate way to handle an animal
- 1.5 identify farm environmental hazards; e.g., sun exposure, water hazards, fuel, human factors

2. examine and demonstrate standards/practices associated with agricultural health and safety
- 2.1 examine and demonstrate standards/practices associated with fire safety by:
  - 2.1.1 examining and justifying the need for fire safety standards
  - 2.1.2 identifying the fire classifications and comparing the appropriate extinguishers
  - 2.1.3 analyzing and discussing the elements of fire
  - 2.1.4 developing a plan to safely address potential fire hazards and identifying fire prevention methods
  - 2.1.5 demonstrating the use of portable fire extinguishers
- 2.2 examine and demonstrate standards/practices associated with electrical safety by:
  - 2.2.1 investigating potential electrical hazards at home, at school and in an agricultural area
  - 2.2.2 developing a plan to safely address potential electrical hazards found in the home, at school and on a farm
  - 2.2.3 creating a strategy for establishing safe work conditions when working with electricity
  - 2.2.4 explaining and applying lockout/tagout procedures on electrical equipment

2.3 examine and demonstrate standards/practices associated with ladder safety by:
- 2.3.1 identifying equipment, machinery and structures where ladders are used in an agricultural area
- 2.3.2 identifying different types of ladders and differentiating when the different types should be used
- 2.3.3 illustrating the safe set-up and use of ladders
- 2.3.4 identifying and demonstrating the proper inspection, care and storage of ladders
- 2.3.5 diagramming ladder safety rules

2.4 examine and demonstrate standards/practices associated with confined space safety by:
- 2.4.1 examining and justifying the need for confined space standards
- 2.4.2 identifying and analyzing what constitutes a confined space and describing the associated dangers
- 2.4.3 determining what tests should be completed before entering a confined space, given the potential hazards of the space
- 2.4.4 creating a plan to be used before entering a given confined space
- 2.4.5 discussing the need for a rescue plan—what should be included, and what training should rescuers have (and why)

2.5 examine and demonstrate standards/practices associated with workplace chemical health and safety by:
- 2.5.1 examining and justifying the need for WHMIS legislation
- 2.5.2 identifying the classes of WHMIS controlled products
- 2.5.3 describing the role of labels on containers of controlled products and describing the type of information that would be found on them
- 2.5.4 describing the role of material safety data sheets and describing the type of information that would be found on them
- 2.5.5 explaining the responsibilities of suppliers, employers and workers when it comes to the safe handling of chemicals in the workplace
- 2.5.6 identifying risk management techniques associated with agricultural chemicals in regard to transportation, storage, spills, handling, exposure and disposal

3. identify and demonstrate methods for dealing with potential hazards in the agricultural area

3.1 describe and demonstrate the use of personal protective equipment (PPE); e.g., helmets, goggles, safety glasses, earmuffs, earplugs, dust masks, respirators, gloves, safety boots

3.2 identify and demonstrate the correct health and safety practices in ergonomic safety procedures; e.g., lifting, loading, shovelling, bending, working alone

3.3 identify and describe common health and safety practices and equipment that should be used around animals

3.4 create an emergency response action plan for rural areas; e.g., location of first aid kits, emergency numbers, emergency addresses, cell phone availability, legal land descriptions and emergency response directions (create a rural emergency plan kit)

3.5 prepare a health and safety action plan for:
- 3.5.1 farm machinery and equipment safety
- 3.5.2 chemical safety
- 3.5.3 fire and electrical hazards
- 3.5.4 farm environmental hazards

4. research and identify legislation and/or exemptions for agricultural health and safety

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 AGR3030: FIELD CROPS 2

Level: Advanced

Prerequisite: AGR2030: Field Crops 1

Description: Students demonstrate the techniques used to produce a field crop, focusing attention on industry trends, crop selection, genetics and reproduction, and production skills. Potential areas of specialization include the production of cereals, forage, oil seeds, pulse crops, mushrooms, spices/herbs, vegetables, fruits, medicinal plants and exotic plants.

Parameters: Access to a land laboratory. Facilities and equipment should permit students to perform practical skills in **two** areas of plant production; e.g., soil preparation, seeding/propagation, crop cultivation, irrigation/fertilization, pest/weed/disease control, harvesting.

Supporting Course: HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. identify trends in the production and use of new varieties of field crops

- 1.1 research production and consumption patterns within Alberta, Canada and the global community
- 1.2 describe the impact of economic, environmental and social trends on production practices within the industry; e.g., international trade and global competition, trade liberalization, rural and urban populations, food safety and consumer confidence, consumer demands, support for research and development, environmental stewardship and sustainable development
- 1.3 identify market factors that influence crop selection, including:
  - 1.3.1 market demands
  - 1.3.2 market size, location and access
  - 1.3.3 market competition
  - 1.3.4 market trends
- 1.4 describe financial opportunities related to crop production, considering:
  - 1.4.1 fixed and variable costs
  - 1.4.2 forecast of returns
  - 1.4.3 risk factors
  - 1.4.4 income stabilization programs
- 1.5 describe land requirements and the suitability of soil and water conditions to production operations
- 1.6 describe the suitability of Alberta's climate to potential crops, considering:
  - 1.6.1 growing days
  - 1.6.2 frost-free days
  - 1.6.3 ambient temperature
  - 1.6.4 soil temperature
- 1.7 describe ways in which government regulations, policies and guidelines may influence production
- 1.8 predict future production on the basis of current issues and trends

2. describe principles of genetics and reproduction and explain their application to field crop species

- 2.1 classify field plants according to:
  - 2.1.1 growth habit
  - 2.1.2 taxonomy
- 2.2 identify field plants, using:
  - 2.2.1 common names
  - 2.2.2 botanical nomenclature
- 2.3 research principles of heredity and their application to plants that are grown, considering:
  - 2.3.1 dominant and recessive traits
  - 2.3.2 selection criteria and procedures
  - 2.3.3 systems of breeding
- 2.4 research reproduction technologies and their application to plants that are grown; e.g., propagation techniques, genetic engineering
- 2.5 describe procedures used within the industry to maintain the quality of plants; e.g., selection criteria and regulations, showing and judging, grading systems and standards, record keeping and record systems

3. demonstrate practical skills in producing a field crop

- 3.1 perform basic field crop production activities; e.g., soil preparation, seeding/propagation, crop cultivation, irrigation/fertilization, pest/weed/disease control, harvesting
- 3.2 apply knowledge of plant management practices, including:
  - 3.2.1 characteristics of plant health and disorders
  - 3.2.2 remedial strategies for plant disorders
  - 3.2.3 disease and pest control
  - 3.2.4 plant growth management
- 3.3 demonstrate techniques for the sustainable use of natural resources, including management practices related to:
  - 3.3.1 soil fertility and conservation
  - 3.3.2 water quality and the hydrologic cycle
- 3.4 explain concerns regarding plant management practices and sustainable production systems, including:
  - 3.4.1 soil, water and air quality
  - 3.4.2 organic and inorganic amendments
  - 3.4.3 biological and chemical control measures
  - 3.4.4 effluent disposal and pollution
  - 3.4.5 food safety and consumer confidence
- 3.5 demonstrate adherence to relevant legislation and policy through production management activities, considering:
  - 3.5.1 environmental constraints
  - 3.5.2 inspection, regulation and quality control

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 AGR3040: LIVESTOCK/POULTRY 2

Level: Advanced

Prerequisite: AGR2040: Livestock/Poultry 1

Description: Students demonstrate the techniques used to manage production livestock, poultry or other animal commodities. Areas of focus include industry trends and opportunities, genetics and reproduction, rations and feeding, housing, animal handling and restraint, animal health and welfare, breeding operations and care for the young. Potential areas of specialization include the production of cattle (beef or dairy), poultry, swine, sheep and diversified livestock (elk, bison and deer).

Parameters: Access to livestock, poultry or specialty animals and to appropriate animal housing and fencing structures.

Outcomes: The student will:

1. **identify industry trends in cattle (beef or dairy), sheep, swine, poultry or diversified livestock production**
   - 1.1 research production and consumption patterns within Alberta, Canada and the global community
   - 1.2 explain the impact of economic, environmental and social trends on production practices within the industry; e.g., international trade and global competition, trade liberalization, rural and urban populations, food safety and consumer confidence, consumer preferences, support for research and development, environmental stewardship and sustainable development
   - 1.3 identify market factors that influence enterprise selection; e.g., market demands and trends, market size, location and access, market competition
   - 1.4 compare financial opportunities related to animal production, considering:
     - 1.4.1 fixed and variable costs
     - 1.4.2 forecast of returns
     - 1.4.3 risk factors
     - 1.4.4 income stabilization programs
   - 1.5 describe ways in which government regulations, policies and guidelines may influence production
   - 1.6 describe land requirements and the suitability of soil, water and climate conditions to production operations
   - 1.7 describe other needs relative to production activities, including:
     - 1.7.1 structures and equipment
     - 1.7.2 labour
     - 1.7.3 transportation
   - 1.8 predict future production on the basis of current issues and trends
2. **describe principles of genetics and reproduction and explain their application to cattle (beef or dairy), sheep, swine, poultry or diversified livestock**
   - 2.1 research principles of heredity and their application to animals that are raised, considering:
     - 2.1.1 dominant and recessive traits
     - 2.1.2 selection criteria and procedures
     - 2.1.3 systems of breeding

2.2 apply knowledge of specific reproduction processes, including:
    2.2.1 estrous cycle
    2.2.2 gestation period
    2.2.3 natural service/artificial insemination
    2.2.4 normal birth process
    2.2.5 age criteria for breeding
2.3 research reproduction technologies and their application to animals that are raised; e.g., embryo transfer, gender selection
2.4 describe procedures used to manage the quality of animals within the industry, including:
    2.4.1 selection criteria and regulations
    2.4.2 pedigrees and performance information
    2.4.3 showing/judging systems and standards
    2.4.4 registry and record systems

3. demonstrate practical skills in raising, growing and finishing cattle (beef or dairy), sheep, swine, poultry or diversified livestock

3.1 perform basic animal production activities; e.g., feeding, housing, handling and restraining, addressing health and welfare, breeding operations, caring for young
3.2 describe approved methods of marking or tagging animals for identification
3.3 identify and apply appropriate strategies for the sustainable use of natural resources; e.g., management practices related to soil fertility and conservation, management practices related to water quality and the hydrologic cycle
3.4 explain concerns regarding animal management and sustainable production systems, considering:
    3.4.1 biotechnology
    3.4.2 food safety
    3.4.3 animal rights
    3.4.4 pollution
3.5 demonstrate adherence to relevant legislation and policy through production management activities, considering:
    3.5.1 environmental health and safety
    3.5.2 personal health and safety

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 AGR3050: AGRIFOODS 2

Level: Advanced

Prerequisite: AGR2050: Agrifoods 1

Description: Students are introduced to the management and development of an agrifood product or related service, focusing attention on government regulation and control, economic principles, product quality and safety, environmental impact and industry trends. Potential areas of investigation include cattle (beef or dairy), poultry, cereals, oil seeds, sugar beets, wine, fruits/vegetables and honey.

Parameters: Access to an agrifoods industry.

Outcomes: The student will:

1. **identify government legislation and policies that regulate practices within an agrifood industry**
   - 1.1 explain the role of government legislation in maintaining product quality and safety within an agrifood industry; e.g., inspection of raw materials, product grading, packaging and labelling, sanitation standards, safety regulations
   - 1.2 describe the mandates of the following government agencies in maintaining product quality and safety:
     - 1.2.1 Agriculture and Agri-Food Canada
     - 1.2.2 Alberta Agriculture and Rural Development
     - 1.2.3 Canada's Office of Consumer Affairs
     - 1.2.4 Health Canada
   - 1.3 describe potential applications of the International Organization for Standardization (ISO) in regulating industry practices
   - 1.4 describe the mandates of the following government agencies regarding industry use of land, water and air:
     - 1.4.1 Alberta Environment
     - 1.4.2 Environment Canada
2. **describe techniques used to manage industry practices, including the application of economic principles, standards for product quality and safety, and measures to reduce environmental impact**
   - 2.1 apply knowledge of basic economic principles to management decisions within the industry; e.g., supply and demand, law of diminishing returns, comparative advantage
   - 2.2 identify criteria and techniques for managing environmental impact; e.g., methods of effluent disposal, water treatment after use, soil conservation practices, use of biodegradable materials
   - 2.3 explain how relevant supply systems may influence industry management; e.g., supply of raw materials, production volumes, access to markets
   - 2.4 describe current issues regarding food quality and sustainable processing systems; e.g., food additives, preservatives and irradiation, use of organic and inorganic materials, effluent disposal and pollution
3. **identify industry trends and opportunities for developing new agrifood products or related services**
   - 3.1 describe production and consumption patterns within Alberta, Canada and the global community
   - 3.2 describe the impact of economic, environmental and social trends on practices within the industry; e.g., international trade and global competition, trade liberalization, rural and urban populations, food safety and consumer confidence, consumer preferences, support for research and development, environmental stewardship and sustainable development

3.3 describe opportunities for product research and development within the industry, including:
    3.3.1 altering existing products or related services
    3.3.2 developing new products or related services
    3.3.3 developing new markets
3.4 predict future production on the basis of current trends and issues

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 AGR3060: LANDSCAPING 3

Level: Advanced

Prerequisites: AGR2060: Landscaping 2
AGR3000: Agriculture Safety

Description: Students demonstrate basic landscape practices, focusing attention on plant identification, effective maintenance practices, diagnosis of problems and installation of specialty items. Potential areas of specialization include residential landscapes, institutional/industrial grounds and recreational/roadside landscapes.

Parameters: Access to a residential, institutional/industrial and/or recreational/roadside landscape and appropriate equipment and supplies. Facilities and equipment should permit students to perform practical tasks in basic landscape services; e.g., watering, cultivation/mulching, corrective pruning, weed control, installation/removal of plant material.

Supporting Courses: HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. identify plants suitable for use in Alberta landscapes
- 1.1 explain the use of taxonomy keys in plant identification
- 1.2 identify five selected deciduous and five coniferous woody plants suitable for use in Alberta landscapes according to:
  - 1.2.1 common name and/or botanical names
  - 1.2.2 general characteristics/growth habits
  - 1.2.3 functional use and growth habits in Alberta landscapes
- 1.3 identify five selected annuals according to:
  - 1.3.1 common name and/or botanical names
  - 1.3.2 general characteristics/growth habits
  - 1.3.3 functional use and growth habits in Alberta landscapes
- 1.4 identify five selected perennials according to:
  - 1.4.1 common name and/or botanical names
  - 1.4.2 general characteristics/growth habits
  - 1.4.3 functional use and growth habits in Alberta landscapes
- 1.5 identify five selected specialty plants (e.g., bulbs, tubers, rhizomes) according to:
  - 1.5.1 common name and/or botanical names
  - 1.5.2 general characteristics/growth habits
  - 1.5.3 functional use and growth habits in Alberta landscapes

2. identify weeds and pests commonly found in Alberta landscapes
- 2.1 identify five selected weeds according to:
  - 2.1.1 common name and/or botanical names
  - 2.1.2 general characteristics and/or growth habits
- 2.2 identify five selected pests according to:
  - 2.2.1 common name and/or order
  - 2.2.2 general characteristics and/or life cycle
- 2.3 compare methods used to control these weeds and pests

3. explore different types of specialty items and/or systems found in Alberta landscapes

3.1 research hardscape structures; e.g., underground sprinkling systems, paving stones, retaining walls, landscape lighting, ponds

3.2 research softscape structures; e.g., hedging and screening, hillside planting, specialty plants

4. explore different types of specialty landscape design

4.1 research a variety of specialty gardens; e.g., Japanese, xeriscaping, sensory garden

4.2 explore the benefits and/or aesthetic value of a specialty garden

4.3 explore local regulations that may influence the selection, design and/or installation of a specialty item or system; e.g., land planning and zoning, use of equipment or chemicals, environmental constraints

4.4 plan and/or cost one specialty item and/or system for an Alberta landscape; e.g., explanation of need, description of component parts, plan for installation, estimated total cost

5. perform routine maintenance of hand tools and/or power equipment used for landscaping

5.1 perform safety checks on equipment

5.2 identify and report potential hazards

5.3 record/report general maintenance and/or malfunctions; e.g., hours of operation, periodic servicing

5.4 prepare basic hand tools/power equipment for off-season storage; e.g., cleaning

6. perform practical skills that promote the health and maintenance of woody plants

6.1 demonstrate techniques for pruning/shaping trees, shrubs and other landscape plants

6.2 develop an understanding of basic pruning; e.g., schedules, methods, shaping, safety

6.3 use various techniques to protect woody plants; e.g., guying, staking, wrapping, edging

7. demonstrate proper landscape procedures

7.1 assess environmental conditions related to plant survival; e.g., zones, wind, drought

7.2 apply seasonal landscaping maintenance practices; e.g., weeding, transplanting, preparing beds, staking, pest control, mulching

7.3 maintain a logbook of landscape gardening activities

8. demonstrate basic competencies

8.1 demonstrate fundamental skills to:

- 8.1.1 communicate
- 8.1.2 manage information
- 8.1.3 use numbers
- 8.1.4 think and solve problems

8.2 demonstrate personal management skills to:

- 8.2.1 demonstrate positive attitudes and behaviours
- 8.2.2 be responsible
- 8.2.3 be adaptable
- 8.2.4 learn continuously
- 8.2.5 work safely

8.3 demonstrate teamwork skills to:

- 8.3.1 work with others
- 8.3.2 participate in projects and tasks

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

9.1 identify short-term and long-term goals

9.2 identify steps to achieve goals

COURSE AGR3070: EQUINE 2

Level: Advanced

Prerequisite: AGR2070: Equine 1

Description: Students develop practical skills, based on approved practices, for providing the daily care of a horse. Attention will focus on the use of physical facilities, procedures for stall cleaning and bedding a horse, guidelines for turnout and shelter, reproductive fundamentals and techniques, and basic horsemanship.

Parameters: Access to a horse and appropriate equine housing/fencing structures.

It is recommended that students have a **minimum of 50 hours** of previous experience in horse handling and horse care prior to commencing the study of AGR2070: Equine 1 and AGR3070: Equine 2. Students must have access to instruction from an individual with specialized training and/or experience related to horsemanship and/or English or Western riding.

Supporting Courses: HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. identify factors to consider in selecting a stable and other physical facilities
- 1.1 describe the use of stables and other confinement structures used in caring for horses, including:
  - 1.1.1 fences and shelters
  - 1.1.2 totally confined rearing structures; e.g., barn
- 1.2 describe criteria relevant to the selection and/or design of structures and equipment, considering:
  - 1.2.1 function, operation and maintenance
  - 1.2.2 safety and efficiency
  - 1.2.3 ethical, legal and environmental factors
  - 1.2.4 economics and cost
- 1.3 identify specific factors to consider in selecting:
  - 1.3.1 a stall/paddock
  - 1.3.2 the type of flooring
  - 1.3.3 interior ancillary facilities
- 1.4 describe selection criteria relevant to watering and feeding systems
- 1.5 describe approved waste management systems
- 1.6 describe factors to consider in selecting an appropriate type of fencing
- 1.7 identify policy, legislation and safe practices relevant to the use of physical structures and equipment

2. demonstrate practical skills and approved procedures for stall cleaning, bedding a horse, turnout and shelter
- 2.1 describe the characteristics of a healthy environment for horses, including:
  - 2.1.1 sanitation
  - 2.1.2 housing
  - 2.1.3 pest control
  - 2.1.4 exercise

2.2 identify agents and sources of stress for a horse and describe their effects on general health
2.3 describe veterinary services that are available and the protocol for accessing these services
2.4 demonstrate appropriate procedures for cleaning and disinfecting stalls
2.5 demonstrate appropriate procedures for bedding a horse
2.6 demonstrate appropriate procedures for turnout and shelter

3. describe the reproductive cycle of horses and describe basic techniques of equine reproduction

3.1 explain reproductive processes characteristic of horses; e.g., estrous cycle, gestation period, natural service/artificial insemination, normal birth process, age criteria for breeding
3.2 identify the signs of the estrous cycle in a mare
3.3 describe methods of preparing a mare and stallion for breeding; e.g., teasing protocol, hormone treatments, artificial light
3.4 describe appropriate procedures for the care and handling of mares and stallions during the breeding season
3.5 explain reproductive technologies that are used in equine breeding; e.g., artificial insemination, embryo transfer, estrus manipulation, gender selection

4. demonstrate approved horsemanship techniques

4.1 demonstrate proper tack fitting
4.2 demonstrate appropriate use of selected bits in communicating with a horse; e.g., snaffle bits, curb bits
4.3 explain applications of various training devices for schooling a horse; e.g., draw rein, German martingale, running martingale, standing martingale, cavesson/headstall, browband
4.4 demonstrate appropriate use of the following artificial aids in reinforcing natural riding aids:
  4.4.1 a riding crop
  4.4.2 spurs
4.5 demonstrate the natural aids of hands and voice while engaging the horse to:
  4.5.1 walk
  4.5.2 yield and half halt
  4.5.3 halt
  4.5.4 turn
4.6 demonstrate the basic positions of the balanced seat at the:
  4.6.1 walk
  4.6.2 trot
  4.6.3 lope/canter
4.7 demonstrate the natural aids of the legs in a balanced seat at the:
  4.7.1 walk
  4.7.2 trot
  4.7.3 lope/canter
4.8 explain the use of psychology in achieving personal riding goals, including:
  4.8.1 focusing
  4.8.2 visualization
  4.8.3 self-talk

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 AGR3085: FLORAL DESIGN 3

Level: Advanced

Prerequisite: AGR2085: Floral Design 2

Description: Students study the requirements and practices involved in providing creative floral design services, focusing on plant and flower identification, advanced design techniques, and floral services for special occasions.

Parameters: Access to a flower arrangement room with refrigeration, a source of water, adequate storage facilities and workbenches/table surfaces for flower arranging.

Outcomes: The student will:

1. **identify and explain the cultural requirements of cut flowers, foliage and interior plants**
   - 1.1 identify flowers, greenery and other materials commonly used in floral design, including:
     - 1.1.1 greenhouse or field-grown cut flowers
     - 1.1.2 imported cut flowers
     - 1.1.3 foliage and filler
     - 1.1.4 dried flowers and foliage
     - 1.1.5 silk and other fabric materials
   - 1.2 explain the advantages and disadvantages of using different types of floral materials
   - 1.3 relate different growth styles of flowers to use in floral arrangements
   - 1.4 explain ethnic and cultural influences on floral materials and practices
2. **construct fresh, dried and/or artificial floral arrangements for special occasions**
   - 2.1 explain and apply elements and principles of design, including:
     - 2.1.1 line, form, pattern and texture
     - 2.1.2 colour, balance and rhythm
     - 2.1.3 scale and proportion
     - 2.1.4 harmony, contrast and repetition
   - 2.2 apply the colour wheel and basic colour theory
   - 2.3 design and construct fresh, dried and/or artificial floral arrangements for special purposes and occasions (e.g., calendar events, weddings, funerals, hospitals), demonstrating special effects and advanced design techniques (e.g., crescent, Hogarth curve, T-shape, L-shape)
3. **calculate the cost and selling price of floral products and services**
   - 3.1 identify fixed and variable costs associated with floral services
   - 3.2 explain and apply pricing formulas used in the floral industry
   - 3.3 calculate the cost price and selling price of a floral arrangement
   - 3.4 explain the importance of accountability for pricing practices used within the industry
4. **identify and perform safe and sanitary practices**
   - 4.1 demonstrate proper handling, use and maintenance of all implements and tools
   - 4.2 apply universal precautions related to blood-borne pathogens; e.g., minor cuts, blood spills
   - 4.3 maintain a clean, sanitary, safe work area
   - 4.4 use all materials and products appropriately
   - 4.5 clean, sanitize and return implements and materials to a storage area after use
   - 4.6 dispose of waste materials in an environmentally safe manner

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 AGR3095: DISPLAY DESIGN

Level: Advanced

Prerequisite: AGR3085: Floral Design 3

Description: Students build on floral design practices and create a promotional floral display, focusing on products and services in the floral industry.

Parameters: Access to a plant potting/flower arrangement room with refrigeration, a source of water, adequate storage facilities and workbenches/table surfaces for potting/flower arranging.

Supporting Course: AGR2095: Indoor Plants

Outcomes: The student will:

1. **identify and explain the cultural requirements of interior plants**
   - 1.1 identify interior plants and gift plants, recognizing both botanical and common name; e.g., tropical flowering plants, foliage plants, flowering bulbs
   - 1.2 explain the cultural requirements of interior plants, including:
     - 1.2.1 light intensity and duration; e.g., low, medium, high, very high
     - 1.2.2 water; e.g., dry, moist, wet
     - 1.2.3 growing medium/soil condition
     - 1.2.4 temperature and humidity
     - 1.2.5 nutrition; e.g., general rate, low, medium, high
2. **demonstrate techniques used to promote products and services within the floral industry**
   - 2.1 identify important components of promotional displays
   - 2.2 establish a theme and goals for a floral display that promotes/advertises a seasonal product and/or service
   - 2.3 design and construct a promotional floral display that promotes/advertises a seasonal product and/or service
   - 2.4 maintain the promotional display for a specified period of time
   - 2.5 disassemble and remove the promotional floral display
3. **calculate the cost and selling price of floral products and services**
   - 3.1 identify fixed and variable costs associated with floral services
   - 3.2 explain and apply pricing formulas used in the floral industry
   - 3.3 calculate the cost price and selling price of the promotional floral display
   - 3.4 explain the importance of accountability for pricing practices used within the industry
4. **identify and perform safe and sanitary practices**
   - 4.1 demonstrate proper handling, use and maintenance of all implements and tools
   - 4.2 apply universal precautions related to blood-borne pathogens; e.g., minor cuts, blood spills
   - 4.3 maintain a clean, sanitary, safe work area
   - 4.4 use all materials and products appropriately
   - 4.5 clean, sanitize and return implements and materials to a storage area after use
   - 4.6 dispose of waste materials in an environmentally safe manner

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 AGR3100: BIOTECHNOLOGY

Level: Advanced

Prerequisite: None

Description: Students present the results of research on applications of biotechnology in agriculture and food production.

Parameters: Access to resources on current applications of biotechnology in agriculture and food production.

Outcomes: The student will:

1. **describe the history and development of biotechnology**
   - 1.1 explain how biotechnology involves the altering of cells and organisms to produce goods and services
   - 1.2 provide a historical perspective on methods by which the characteristics of plants and animals have been altered, including:
     - 1.2.1 natural selection
     - 1.2.2 selective breeding
     - 1.2.3 genetic engineering
   - 1.3 describe basic vocabulary and techniques used in genetic engineering, including:
     - 1.3.1 chromosome
     - 1.3.2 gene
     - 1.3.3 gene mapping
     - 1.3.4 gene splicing
     - 1.3.5 cloning
   - 1.4 outline emerging applications of biotechnology
2. **identify the benefits and costs associated with applications of biotechnology in agriculture and food production**
   - 2.1 describe specific applications of biotechnology in agriculture and food production; e.g., product and market development, industry diversification, production efficiency, disease and pest control
   - 2.2 describe environmental, economic and ethical issues related to developments in biotechnology; e.g., use of natural resources, control and patenting of life forms, impact of genetically altered organisms, food quality and safety, world food supply
   - 2.3 predict possible effects of new biotechnologies on producers, processors, consumers and governments
   - 2.4 explain the role of legislation in regulating developments in biotechnology
   - 2.5 identify a specific problem in agriculture and food production recently addressed through biotechnology (e.g., production costs, product quality, market supply, environmental impact) and:
     - 2.5.1 identify key stakeholder groups affected by the problem
     - 2.5.2 describe funding and partnerships that were established to address the problem
     - 2.5.3 explain applications of biotechnology in dealing with the problem; e.g., principles of genetic engineering, scientific design, experimental outcomes
     - 2.5.4 describe the social, economic and environmental consequences of experimental outcomes

2.5.5 make recommendations regarding the use of biotechnology and practical solutions to the problem; e.g., management actions, further research

3. explain the process used to develop a recent biotechnology within Alberta's agriculture industry

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 AGR3120: SOILS MANAGEMENT 2

Level: Advanced

Prerequisite: AGR2120: Soils Management 1

Description: Students study appropriate soil testing and amending techniques and learn to interpret soil survey maps and reports.

Parameters: Access to a science laboratory and land laboratory.

Outcomes: The student will:

1. **select appropriate fertilization techniques based on an analysis of the nutrient requirements of plants**
   - 1.1 list the names and sources of essential micronutrients and macronutrients for plants
   - 1.2 describe soil colloids and their role in storing and releasing plant nutrients
   - 1.3 identify major fertilizer nutrients and describe their benefits to plant growth
   - 1.4 distinguish between natural and synthetic fertilizers and explain the advantages and disadvantages of each
   - 1.5 define fertilizer grade and give examples of commonly used grades
   - 1.6 describe the pros and cons of specialty fertilizer products
   - 1.7 describe common methods of fertilizer application
   - 1.8 calculate an appropriate amount and blend of fertilizer based upon plant nutrient requirements
2. **demonstrate appropriate soil sampling techniques and interpret soil test reports**
   - 2.1 identify reasons for soil testing
   - 2.2 identify major soil nutrients and soil quality factors evaluated through a soil test
   - 2.3 describe the steps involved in conducting a soil test, including:
     - 2.3.1 soil sampling
     - 2.3.2 laboratory analysis
     - 2.3.3 interpretation of results
   - 2.4 demonstrate accurate soil sampling techniques
   - 2.5 describe the major elements of a soil test report, including:
     - 2.5.1 soil and cropping information
     - 2.5.2 fertilizer recommendations
     - 2.5.3 soil analysis results
     - 2.5.4 yield increase data
   - 2.6 interpret a soil test report
3. **describe the legal location of a parcel of land, using the Dominion Land Survey (Western Grid Survey System)**
   - 3.1 identify and describe components of the Dominion Land Survey (Western Grid Survey System), including:
     - 3.1.1 lines of latitude and longitude
     - 3.1.2 townships and ranges
     - 3.1.3 sections and legal subdivisions
     - 3.1.4 roads
   - 3.2 identify the area of a parcel of land based upon information provided through its legal land description

3.3 provide reasons for correction lines, partial sections and acreage anomalies
3.4 locate a specific parcel of land on a soil map by applying knowledge of its legal land description

4. read and interpret soil survey maps and reports

4.1 describe key components of the Canada Land Inventory (CLI) system, including:
- 4.1.1 soil classes and subclasses
- 4.1.2 climatic subregions

4.2 describe the agricultural capacity of a given piece of land by interpreting a CLI Soil Capability for Agriculture map
4.3 describe the strengths and limitations of information provided through CLI maps in establishing agriculture management and conservation practices
4.4 describe the nature and purpose of information conveyed through a soil survey map and report, including:
- 4.4.1 overview of natural environment
- 4.4.2 classification of soils
- 4.4.3 potential land use

4.5 identify and explain components of a soil survey map, including:
- 4.5.1 map units
- 4.5.2 map legend
- 4.5.3 map symbols
- 4.5.4 reference section
- 4.5.5 key map

4.6 interpret a soil survey map and report

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 AGR3150: GREENHOUSE/NURSERY CROPS 3

Level: Advanced

Prerequisite: AGR2150: Greenhouse/Nursery Crops 2

Description: Students apply knowledge of materials and processes in identifying, selecting, growing and maintaining a greenhouse crop, focusing on a marketable crop.

Parameters: Access to a land laboratory and/or controlled growing environment. Facilities and equipment should permit students to perform practical tasks in plant production, as is required to produce a greenhouse crop; e.g., soil preparation, plant propagation, transplanting, cultivation, watering and fertilizing, pest and disease control.

Access to instruction from an individual with a Pesticide Applicator/Dispenser Certificate is required.

Supporting Courses: AGR3000: Agriculture Safety
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. **identify and assess opportunities for producing a greenhouse crop**
   - 1.1 explain how personal/customer needs may influence crop selection; e.g., food for consumption, economic goals, aesthetics, personal motivation, aptitude
   - 1.2 identify market factors that influence crop selection; e.g., market demands, market size, market trends, market competition
   - 1.3 describe financial opportunities related to crop production; e.g., forecast of returns, risk factors
   - 1.4 describe costs related to crop production; e.g., fixed and variable costs
   - 1.5 consider the use of promotional technologies to market products
   - 1.6 explore the legalities of marketing a greenhouse crop
   - 1.7 describe land requirements and/or the suitability of soil and water conditions to production operations
   - 1.8 describe the suitability of Alberta's climate to potential crops; e.g., growing days, frost-free days, ambient temperature, soil temperature
   - 1.9 describe equipment needs at different stages of production; e.g., seeding/planting, cultivation, harvesting
   - 1.10 describe labour and transportation needs within the industry; e.g., availability, cost
2. **identify and describe greenhouse plants suited to Alberta climates**
   - 2.1 classify plants according to:
     - 2.1.1 growth habit
     - 2.1.2 taxonomy
   - 2.2 research principles of heredity and/or reproduction technologies and their application to plants that are grown; e.g., dominant and recessive traits, selection criteria and procedures, systems of breeding, propagation techniques, hybridization, heritage seeds
   - 2.3 identify marketable crops grown in Alberta greenhouses; e.g., poinsettias, bedding plants, Easter lilies, hydrangeas, perennials, gift pans, herbs
   - 2.4 describe procedures used to maintain the quality of plants within the industry; e.g., selection criteria, application of hybridization, showing and judging

3. identify strategies for managing a crop from seed to sale

- 3.1 apply knowledge of plant management practices in production activities; e.g., characteristics of plant health and disorders, remedial strategies for plant disorders, disease and pest control
- 3.2 use appropriate techniques to propagate greenhouse plants
- 3.3 apply principles of nutrition to production practices, including:
  - 3.3.1 reviewing the functions of micronutrients, macronutrients and secondary nutrients
  - 3.3.2 diagnosing and treating plants for nutrient excesses and deficiencies
  - 3.3.3 discussing and assisting in fertilizer preparation; e.g., mixing, measuring
  - 3.3.4 determining the pH and electroconductivity (EC) levels of soil
  - 3.3.5 assisting with the application of necessary nutrients
- 3.4 demonstrate techniques for maintaining a sustainable production system; e.g., organic and inorganic amendments, biological and chemical control measures, waste disposal in an environmentally responsible manner

4. demonstrate practical skills in growing a greenhouse crop

- 4.1 prepare the growing medium/seed bed
- 4.2 use appropriate methods of propagation and/or transplanting
- 4.3 define appropriate use of growing space
- 4.4 apply appropriate cultivating, watering and fertilizing techniques
- 4.5 control plant pests and diseases, using nontoxic, safe material
- 4.6 prepare packaging for plant material
- 4.7 use soil and water conservation practices
- 4.8 maintain an anecdotal record/logbook of production tasks
- 4.9 assess a time line and participate in a scheduling process
- 4.10 evaluate cultural requirements; e.g., soil medium, light, water, fertilizer, spacing

5. develop and present a plan for future greenhouse crop production, based on the outcomes of current production practices

- 5.1 describe production venture outcomes based on:
  - 5.1.1 product quality
  - 5.1.2 product saleability
  - 5.1.3 application of new skills
- 5.2 describe the impact of economic, environmental and/or social factors on production practices and outcomes
- 5.3 make recommendations regarding future production ventures on the basis of current accomplishments and challenges in plant production

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

7.1 identify short-term and long-term goals

7.2 identify steps to achieve goals

COURSE AGR3160: TURF MANAGEMENT

Level: Advanced

Prerequisite: AGR1070: Landscaping 1

Description: Students demonstrate the techniques used to provide turf maintenance services, focusing on plant identification, equipment maintenance, effective practices, cost analysis and pricing.

Parameters: Access to a residential, recreational and/or institutional landscape and appropriate equipment and supplies. Facilities and equipment should permit students to perform practical tasks in basic turf management; e.g., watering, mowing/trimming/edging of turfgrass, weed control.

Supporting Courses: AGR3000: Agriculture Safety
HCS2020: First Aid/CPR with AED
HCS3000: Workplace Safety Systems

Outcomes: The student will:

1. **identify ground cover and turfgrass species used for landscaping**
   - 1.1 describe methods of identifying turfgrass, including:
     - 1.1.1 using common names
     - 1.1.2 using botanical nomenclature
   - 1.2 describe the general characteristics and functional uses of turfgrasses
   - 1.3 identify and select appropriate turfgrasses for given applications in Alberta landscapes, considering:
     - 1.3.1 rhizome producing, stolon producing and bunch type
     - 1.3.2 fine, medium and course leaf texture
   - 1.4 describe the cultural requirements of turfgrass; e.g., soil, moisture, light, temperature, trimming
2. **implement appropriate strategies for the treatment and prevention of pests, diseases and ailments that affect the health of turfgrass**
   - 2.1 identify common weeds and insect pests at different stages of growth
   - 2.2 discuss the beneficial and harmful effects of insects
   - 2.3 describe and correct turfgrass problems; e.g., fairy rings, scalping, ridging, compacting, animal and disease problems
   - 2.4 compare biological, cultural and chemical control measures for weeds and plant pests
   - 2.5 list the pros and cons associated with the use of common pesticides
   - 2.6 explain safe practices for mixing and applying fertilizers and chemicals
   - 2.7 develop a weed-control program
3. **demonstrate proper techniques for maintenance of turfgrass**
   - 3.1 demonstrate proper procedures in maintenance; e.g., clean-up, dethatching, aerating, top-dressing, irrigation, fertilizing, patching, mowing, trimming, edging
   - 3.2 describe proper techniques for winterizing turfgrasses
   - 3.3 identify and describe organic and inorganic materials commonly used in providing basic turf-care services; e.g., fertilizers, pesticides
   - 3.4 demonstrate proper watering techniques

4. demonstrate practical skills in using tools to perform basic turf-care services

- 4.1 identify and describe hand and/or power equipment commonly used in providing turf-care services; e.g., aerators, mowers, chemical and fertilizer applicators
- 4.2 demonstrate safe and efficient use of hand/power tools (e.g., rakes, power rakes, edgers, trimmers, blowers), considering:
  - 4.2.1 safe practices and potential hazards
  - 4.2.2 protective clothing
  - 4.2.3 safety labels and instructions
  - 4.2.4 government legislation and regulation
  - 4.2.5 emergency first aid
- 4.3 perform safety checks on equipment
- 4.4 record/report general maintenance and/or malfunctions; e.g., hours of operation, periodic servicing
- 4.5 prepare basic hand tools/power equipment for off-season storage; e.g., cleaning
- 4.6 compare two-stroke and four-stroke engines and their required maintenance

5. prepare cost analyses and pricing for basic turf-grass services

- 5.1 identify factors that determine the cost of a turfgrass service; e.g., material costs, labour costs, equipment usage costs, overhead costs
- 5.2 explain technologies used to cost and price turfgrass services; e.g., software
- 5.3 prepare simple cost analyses and pricing for basic turfgrass services

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

- 7.1 identify short-term and long-term goals
- 7.2 identify steps to achieve goals

COURSE AGR3910: AGR 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 AGR3920: AGR 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 AGR3950: AGR 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