
CAREER AND TECHNOLOGY STUDIES

A. PROGRAM RATIONALE AND PHILOSOPHY

Through Career and Technology Studies (CTS), secondary education in Alberta is responding to the many challenges of modern society, helping young people develop daily living skills and nurturing a flexible, well-qualified work force.

In Canada's information society, characterized by rapid change in the social and economic environment, students must be confident in their ability to respond to change and successfully meet the challenges they face in their own personal and work lives. In particular, they make decisions about what they will do when they finish high school. Many students will enter the work force, others will continue their education. All students face the challenges of growing independence and responsibility, and of entering post-secondary programs and/or the highly competitive workplace.

Secondary schools also face challenges. They must deliver, on a consistent basis, high quality, cost-effective programs that students, parents and the community find credible and relevant.

CTS helps schools and students meet these challenges. Schools can respond more efficiently and effectively to student and community needs and expectations by taking advantage of the opportunities in the CTS curriculum to design courses and access school, community and distance learning resources. Students can develop the confidence they need as they move into adult roles by assuming increased responsibility for their

learning; cultivating their individual talents, interests and abilities; and by defining and acting on their goals.

As an important component of education in Alberta secondary schools, CTS promotes student achievement by setting clear expectations and recognizing student success. Students in CTS develop competencies—the knowledge, skills and attitudes they are expected to demonstrate, that is, what they know and what they are able to do.

Acquired competencies can be applied now and in the future as students make a smooth transition into adult roles in the family, community, workplace and/or further education. To facilitate this transition, clearly stated expectations and standards have been defined in cooperation with teachers, business and industry representatives and post-secondary educators.

CTS offers all students important learning opportunities. Regardless of the particular area of study chosen, *students in CTS will:*

- develop skills that can be applied in their daily lives, now and in the future
- refine career-planning skills
- develop technology-related skills
- enhance employability skills
- apply and reinforce learnings developed in other subject areas.

In CTS, students build skills they can apply in their everyday lives. For example, in the CTS program, particularly at the introductory levels, students have the opportunity to improve their ability to make sound consumer decisions and to appreciate environmental and safety precautions.



A career encompasses more than activities just related to a person's job or occupation; it involves one's personal life in both local and global contexts; e.g., as a family member, a friend, a community volunteer, a citizen of the world.

The integration of careers throughout the CTS program helps students to make effective career decisions and to target their efforts. CTS students will have the opportunity to expand their knowledge about careers, occupations and job opportunities, as well as the education and/or training requirements involved. Also, students come to recognize the need for lifelong learning.

Students in CTS have the opportunity to use and apply technology and systems effectively and efficiently. This involves:

- a decision regarding which processes and procedures best suit the task at hand
- the appropriate selection and skilled use of the tools and/or resources available
- an assessment of and management of the impact the use of the technology may have on themselves, on others and on the environment.



Integrated throughout CTS are employability skills, those basic competencies that help students develop their personal management and social skills. Personal management skills are improved as students take increased responsibility for their learning, design innovative solutions to problems and challenges, and manage resources effectively and efficiently. Social skills improve through learning experiences that require students to work effectively with others, demonstrate teamwork and leadership, and maintain high standards in safety and accountability.

As well as honing employability skills, CTS reinforces and enhances learnings developed in core and other optional courses. The curriculum emphasizes, as appropriate, the effective application of communication and numeracy skills.

In addition to the common outcomes described above, students focusing on a particular area of study will develop career-specific competencies that support entry into the workplace and/or related post-secondary programs. Career-specific competencies can involve understanding and applying appropriate terminology, processes and technologies related to a specific career, occupation or job.

PROGRAM OUTCOMES

The program outcomes describe the basic competencies integrated throughout the CTS program.

Within an applied context relevant to personal goals, aptitudes and abilities; *the student* in CTS will:

- demonstrate the basic knowledge, skills and attitudes necessary for achievement and fulfillment in personal life
- develop an action plan that relates personal interests, abilities and aptitudes to career opportunities and requirements
- use technology effectively to link and apply appropriate tools, management and processes to produce a desired outcome
- develop basic competencies (employability skills), by:
 - selecting relevant, goal-related activities, ranking them in order of importance, allocating necessary time, and preparing and following schedules (managing learning)
 - linking theory and practice, using resources, tools, technology and processes responsibly and efficiently (managing resources)
 - applying effective and innovative decision-making and problem-solving strategies in the design, production, marketing and consumption of goods and services (problem solving and innovation)
 - demonstrating appropriate written and verbal skills, such as composition, summarization and presentation (communicating effectively)
 - participating as a team member by working cooperatively with others and contributing to the group with ideas, suggestions and effort (working with others)

- maintaining high standards of ethics, diligence, attendance and punctuality, following safe procedures consistently, and recognizing and eliminating potential hazards (demonstrating responsibility).

PROGRAM ORGANIZATION

CURRICULUM STRUCTURE

Career and Technology Studies is organized into **strands** and **courses**.

Strands in CTS define competencies that help students:

- build daily living skills
- investigate career options
- use technology (managing, processes, tools) effectively and efficiently
- prepare for entry into the workplace and/or related post-secondary programs.

In general, strands relate to selected industry sectors offering positive occupational opportunities for students. Some occupational opportunities require further education after high school, and some allow direct entry into the workplace. Industry sectors encompass goods-producing industries, such as agriculture, manufacturing and construction; and service-producing industries, such as business, health, finance and insurance.

Courses are the building blocks for each strand. They define what a student is expected to know and be able to do (exit-level *competencies*). Courses also specify prerequisites. Recommendations for course parameters, such as instructional qualifications, facilities and equipment can be found in the guides to implementation.

The competencies a student must demonstrate to achieve success in a course are defined through *general outcomes*. Senior high school students who can demonstrate the general outcomes defined for a CTS course; i.e., who have the designated competencies, will qualify for 1 credit toward their high school diploma.

Specific outcomes provide a more detailed framework for instruction. Within the context of the general outcomes, the specific outcomes further define the knowledge, skills and attitudes the student should acquire.

The following chart shows the 22 strands that comprise the CTS program and the number of 1-credit courses available in each strand.

Strand	No. of Courses
1. Agriculture	33
2. Career Transitions	32
3. Communication Technology	35
4. Community Health	31
5. Construction Technologies	46
6. Cosmetology Studies	58
7. Design Studies	31
8. Electro-Technologies	37
9. Energy and Mines	26
10. Enterprise and Innovation	8
11. Fabrication Studies	44
12. Fashion Studies	29
13. Financial Management	16
14. Foods	37
15. Forestry	21
16. Information Processing	53
17. Legal Studies	13
18. Logistics	12
19. Management and Marketing	20
20. Mechanics	54
21. Tourism Studies	24
22. Wildlife	17

LEVELS OF ACHIEVEMENT

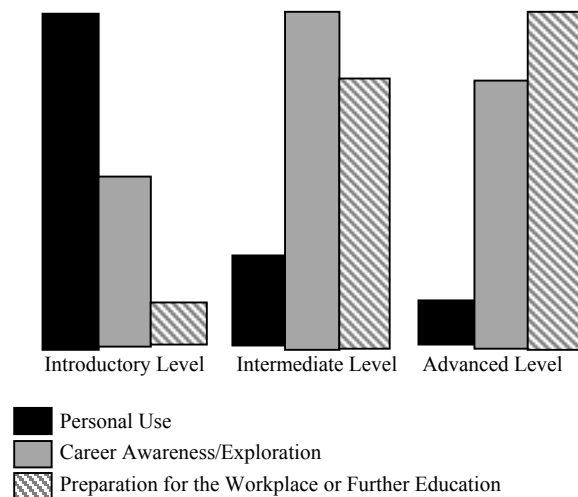
Courses are organized into three levels of achievement: **introductory**, **intermediate** and **advanced**. As students progress through the levels, they will be expected to meet higher standards and demonstrate an increased degree of competence, in both the program outcomes and the general outcomes defined for individual courses.

Introductory level courses help students build daily living skills and form the basis for further learning. Introductory courses are for students who have no previous experience in the strand.

Intermediate level courses build on the competencies developed at the introductory level. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

Advanced level courses refine expertise and help prepare students for entry into the workplace or a related post-secondary program.

The graph below illustrates the relative emphasis on the aspects of career planning at each of the levels.



CURRICULUM AND ASSESSMENT STANDARDS

Curriculum standards in CTS define what students must know and be able to do. Curriculum standards are expressed through the program outcomes for CTS, and through general and specific outcomes defined for individual courses within each strand.

Assessment standards define how student performance is to be judged. In CTS, each assessment standard defines the conditions and criteria to be used for assessing the competencies associated with each general outcome. To receive credit for a course, students must demonstrate competency at the level specified by the conditions and criteria defined for each general outcome.

Students throughout the province receive a fair and reliable assessment as they use the standards to guide their efforts, thus ensuring they participate more effectively and successfully in the learning and assessment process. Standards at advanced levels are, as much as possible, linked to workplace and post-secondary entry-level requirements.

TYPES OF COMPETENCIES

Two types of competencies are defined within the CTS program: basic and career-specific.

Basic competencies are generic to any career area and are developed within each course. Basic competencies include:

- personal management; e.g., managing learning, being innovative, ethics, managing resources
- social; e.g., communication, teamwork, leadership and service, demonstrating responsibility (safety and accountability).

Career-specific competencies relate to a particular strand. These competencies build daily living skills at the introductory levels and support the smooth transition to the workplace and/or post-secondary programs at the intermediate and advanced levels.

The model below shows the relationship of the two types of competencies within the 22 strands of the CTS program.












BASIC COMPETENCIES REFERENCE GUIDE

The chart below outlines basic competencies that students endeavour to develop and enhance in each of the CTS strands and courses. Students' basic competencies should be assessed through observations involving the student, teacher(s), peers and others as they complete the requirements for each course. In general, there is a progression of task complexity and student initiative as outlined in the Developmental Framework★. **As students progress through Stages 1, 2, 3 and 4 of this reference guide, they build on the competencies gained in earlier stages.** Students leaving high school should set themselves a goal of being able to demonstrate Stage 3 performance.

Suggested strategies for classroom use include:

- having students rate themselves and each other
- using in reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- maintaining a student portfolio.

Stage 1— <i>The student:</i>	Stage 2— <i>The student:</i>	Stage 3— <i>The student:</i>	Stage 4— <i>The student:</i>
<p>Managing Learning</p> <ul style="list-style-type: none"> <input type="checkbox"/> comes to class prepared for learning <input type="checkbox"/> follows basic instructions, as directed <input type="checkbox"/> acquires specialized knowledge, skills and attitudes <input type="checkbox"/> identifies criteria for evaluating choices and making decisions <input type="checkbox"/> uses a variety of learning strategies 	<p><input type="checkbox"/> </p> <ul style="list-style-type: none"> <input type="checkbox"/> follows instructions, with limited direction <input type="checkbox"/> sets goals and establishes steps to achieve them, with direction <input type="checkbox"/> applies specialized knowledge, skills and attitudes in practical situations <input type="checkbox"/> identifies and applies a range of effective strategies for solving problems and making decisions <input type="checkbox"/> explores and uses a variety of learning strategies, with limited direction 	<p><input type="checkbox"/> </p> <ul style="list-style-type: none"> <input type="checkbox"/> follows detailed instructions on an independent basis <input type="checkbox"/> sets clear goals and establishes steps to achieve them <input type="checkbox"/> transfers and applies specialized knowledge, skills and attitudes in a variety of situations <input type="checkbox"/> uses a range of critical thinking skills to evaluate situations, solve problems and make decisions <input type="checkbox"/> selects and uses effective learning strategies <input type="checkbox"/> cooperates with others in the effective use of learning strategies 	<p><input type="checkbox"/> </p> <p><input type="checkbox"/> </p> <ul style="list-style-type: none"> <input type="checkbox"/> demonstrates self-direction in learning, goal setting and goal achievement <input type="checkbox"/> transfers and applies learning in new situations; demonstrates commitment to lifelong learning <input type="checkbox"/> thinks critically and acts logically to evaluate situations, solve problems and make decisions <input type="checkbox"/> <input type="checkbox"/> provides leadership in the effective use of learning strategies
<p>Managing Resources</p> <ul style="list-style-type: none"> <input type="checkbox"/> adheres to established timelines; uses time/schedules/planners effectively <input type="checkbox"/> uses information (material and human resources), as directed <input type="checkbox"/> uses technology (facilities, equipment, supplies), as directed, to perform a task or provide a service <input type="checkbox"/> maintains, stores and/or disposes of equipment and materials, as directed 	<ul style="list-style-type: none"> <input type="checkbox"/> creates and adheres to timelines, with limited direction; uses time/schedules/planners effectively <input type="checkbox"/> accesses and uses a range of relevant information (material and human resources), with limited direction <input type="checkbox"/> uses technology (facilities, equipment, supplies), as appropriate, to perform a task or provide a service, with minimal assistance and supervision <input type="checkbox"/> maintains, stores and/or disposes of equipment and materials, with limited assistance 	<ul style="list-style-type: none"> <input type="checkbox"/> creates and adheres to detailed timelines on an independent basis; prioritizes task; uses time/schedules/planners effectively <input type="checkbox"/> accesses a range of information (material and human resources), and recognizes when additional resources are required <input type="checkbox"/> selects and uses appropriate technology (facilities, equipment, supplies) to perform a task or provide a service on an independent basis <input type="checkbox"/> maintains, stores and/or disposes of equipment and materials on an independent basis 	<ul style="list-style-type: none"> <input type="checkbox"/> creates and adheres to detailed timelines; uses time/schedules/planners effectively; prioritizes tasks on a consistent basis <input type="checkbox"/> uses a wide range of information (material and human resources) in order to support and enhance the basic requirement <input type="checkbox"/> recognizes the monetary and intrinsic value of managing technology (facilities, equipment, supplies) <input type="checkbox"/> demonstrates effective techniques for managing facilities, equipment and supplies
<p>Problem Solving and Innovation</p> <ul style="list-style-type: none"> <input type="checkbox"/> participates in problem solving as a process <input type="checkbox"/> learns a range of problem-solving skills and approaches <input type="checkbox"/> practices problem-solving skills by responding appropriately to a clearly defined problem, specified goals and constraints, by: <ul style="list-style-type: none"> – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action 	<ul style="list-style-type: none"> <input type="checkbox"/> identifies the problem and selects an appropriate problem-solving approach, responding appropriately to specified goals and constraints <input type="checkbox"/> applies problem-solving skills to a directed or a self-directed activity, by: <ul style="list-style-type: none"> – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action 	<ul style="list-style-type: none"> <input type="checkbox"/> thinks critically and acts logically in the context of problem solving <input type="checkbox"/> transfers problem-solving skills to real-life situations, by generating new possibilities <input type="checkbox"/> prepares implementation plans <input type="checkbox"/> recognizes risks 	<ul style="list-style-type: none"> <input type="checkbox"/> identifies and resolves problems efficiently and effectively <input type="checkbox"/> identifies and suggests new ideas to get the job done creatively, by: <ul style="list-style-type: none"> – combining ideas or information in new ways – making connections among seemingly unrelated ideas – seeking out opportunities in an active manner

Stage 1— <i>The student:</i>	Stage 2— <i>The student:</i>	Stage 3— <i>The student:</i>	Stage 4— <i>The student:</i>
<p>Communicating Effectively</p> <ul style="list-style-type: none"> <input type="checkbox"/> uses communication skills; e.g., reading, writing, illustrating, speaking <input type="checkbox"/> uses language in appropriate context <input type="checkbox"/> listens to understand and learn <input type="checkbox"/> demonstrates positive interpersonal skills in selected contexts 	<ul style="list-style-type: none"> <input type="checkbox"/> communicates thoughts, feelings and ideas to justify or challenge a position, using written, oral and/or visual means <input type="checkbox"/> uses technical language appropriately <input type="checkbox"/> listens and responds to understand and learn <input type="checkbox"/> demonstrates positive interpersonal skills in many contexts 	<ul style="list-style-type: none"> <input type="checkbox"/> prepares and effectively presents accurate, concise, written, visual and/or oral reports providing reasoned arguments <input type="checkbox"/> encourages, persuades, convinces or otherwise motivates individuals <input type="checkbox"/> listens and responds to understand, learn and teach <input type="checkbox"/> demonstrates positive interpersonal skills in most contexts 	<ul style="list-style-type: none"> <input type="checkbox"/> negotiates effectively, by working toward an agreement that may involve exchanging specific resources or resolving divergent interests <input type="checkbox"/> negotiates and works toward a consensus <input type="checkbox"/> listens and responds to understand, learn, teach and evaluate <input type="checkbox"/> promotes positive interpersonal skills among others
<p>Working with Others</p> <ul style="list-style-type: none"> <input type="checkbox"/> fulfills responsibility in a group project <input type="checkbox"/> works collaboratively in structured situations with peer members <input type="checkbox"/> acknowledges the opinions and contributions of others in the group 	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/> cooperates to achieve group results <input type="checkbox"/> maintains a balance between speaking, listening and responding in group discussions <input type="checkbox"/> respects the feelings and views of others 	<ul style="list-style-type: none"> <input type="checkbox"/> seeks a team approach, as appropriate, based on group needs and benefits; e.g., idea potential, variety of strengths, sharing of workload <input type="checkbox"/> works in a team or group: <ul style="list-style-type: none"> – encourages and supports team members – helps others in a positive manner – provides leadership/followership as required – negotiates and works toward consensus as required 	<ul style="list-style-type: none"> <input type="checkbox"/> leads, where appropriate, mobilizing the group for high performance <input type="checkbox"/> understands and works within the context of the group <input type="checkbox"/> prepares, validates and implements plans that reveal new possibilities
<p>Demonstrating Responsibility</p> <p>Attendance</p> <ul style="list-style-type: none"> <input type="checkbox"/> demonstrates responsibility in attendance, punctuality and task completion <p>Safety</p> <ul style="list-style-type: none"> <input type="checkbox"/> follows personal and environmental health and safety procedures <input type="checkbox"/> identifies immediate hazards and their impact on self, others and the environment <input type="checkbox"/> follows appropriate/emergency response procedures <p>Ethics</p> <ul style="list-style-type: none"> <input type="checkbox"/> makes personal judgements about whether or not certain behaviours/actions are right or wrong 	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/> recognizes and follows personal and environmental health and safety procedures <input type="checkbox"/> identifies immediate and potential hazards and their impact on self, others and the environment <input type="checkbox"/>  <input type="checkbox"/> assesses how personal judgements affect other peer members and/or family; e.g., home and school 	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/> establishes and follows personal and environmental health and safety procedures <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> assesses the implications of personal/group actions within the broader community; e.g., workplace 	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/> transfers and applies personal and environmental health and safety procedures to a variety of environments and situations <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> demonstrates accountability for actions taken to address immediate and potential hazards <input type="checkbox"/> analyzes the implications of personal/group actions within the global context <input type="checkbox"/> states and defends a personal code of ethics as required
<p>★Developmental Framework</p> <ul style="list-style-type: none"> • <i>Simple task</i> • <i>Structured environment</i> • <i>Directed learning</i> 	<ul style="list-style-type: none"> • <i>Task with limited variables</i> • <i>Less structured environment</i> • <i>Limited direction</i> 	<ul style="list-style-type: none"> • <i>Task with multiple variables</i> • <i>Flexible environment</i> • <i>Self-directed learning, seeking assistance as required</i> 	<ul style="list-style-type: none"> • <i>Complex task</i> • <i>Open environment</i> • <i>Self-directed/self-motivated</i>

AGRICULTURE

B. STRAND RATIONALE AND PHILOSOPHY

Agriculture is a diverse endeavour involving both rural and urban communities. It affects the quality of life of all Albertans. Agriculture encompasses not only the direct production of primary goods, but also the processing and service industries. It is the second most important area of economic activity in Alberta.★

Growth and development opportunities exist for agriculture products and technologies. The continued strength of Alberta's agriculture industries in domestic and international markets can be ensured through practices that add value to agriculture commodities, and by diversifying products and services to meet consumer needs.

Agriculture involves using our most basic resources: soil, water, plants, animals and people. Concern for the environment provides continuing incentive for new technologies and methods of managing interactions among these resources. Industry practices must ensure the sustainable use of natural resources.

Agriculture, a strand in Career and Technology Studies, provides a comprehensive view of agriculture in Alberta. It encompasses plant and animal production, interior and exterior plantscape, animal husbandry, the agrifood

industry, market research and development, and environmental management. Students will develop first-hand knowledge of practices within Alberta's agriculture industries and will apply this knowledge in producing agriculture products and providing related services.

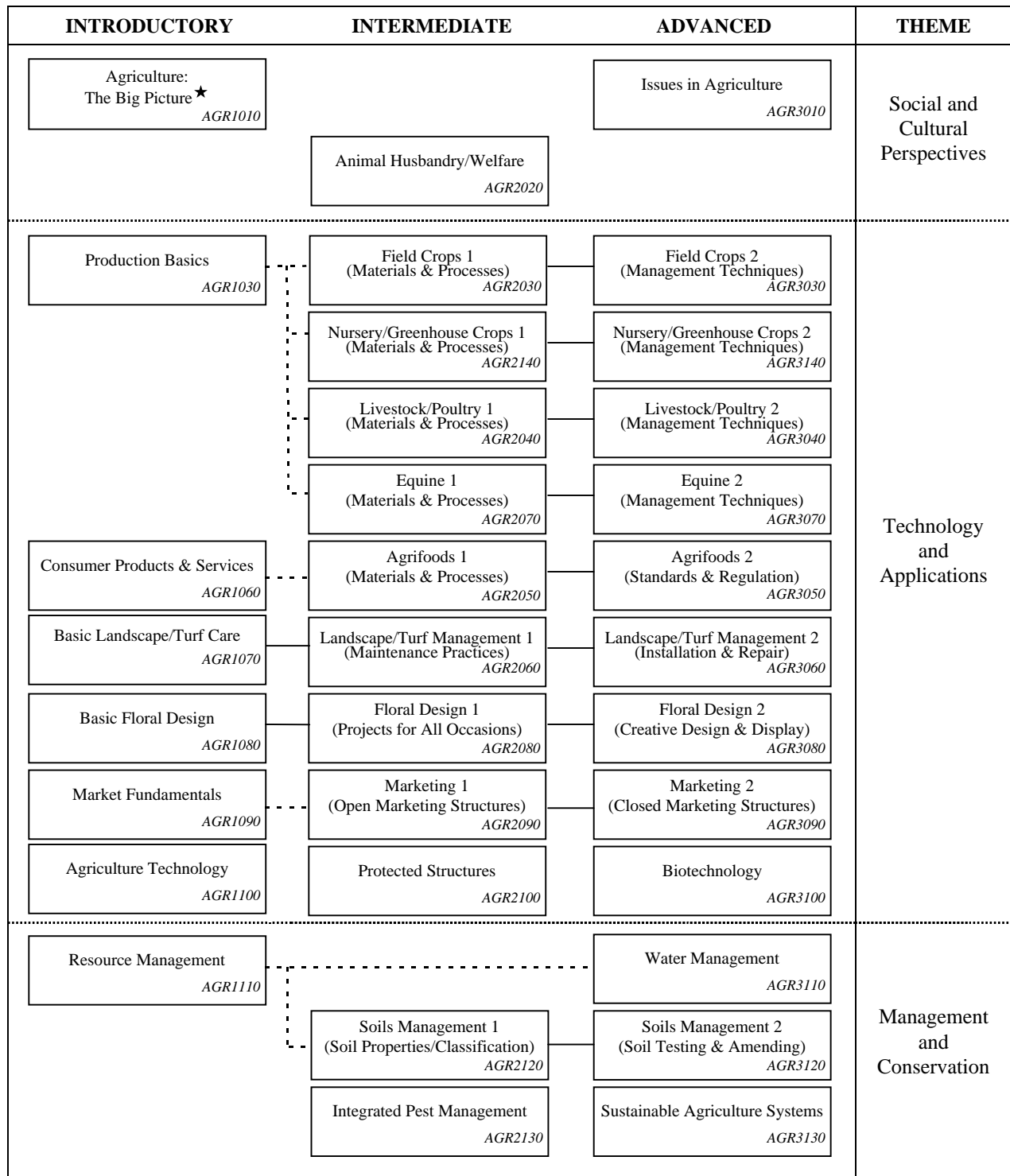


Students in Agriculture will develop the knowledge, skills, attitudes, motivation and commitment to work individually and collectively, as private citizens and members of the work force, toward the conservation and responsible use of water, land, air, forests and wildlife. Within the philosophy of Career and Technology Studies, *students in Agriculture will:*

★ *Agriculture in Alberta*. Edmonton, AB: Alberta Agriculture, Food and Rural Development, 1993.

- develop greater awareness of the economic, environmental and social significance of agriculture in Alberta and the rest of the world, and develop awareness of factors affecting industry decisions
- describe the characteristics of Alberta's agriculture and horticulture industries, and identify resulting products and services
- describe technologies and research programs that support sustainable agriculture systems and that enhance the development of a range of products and services
- translate sustainable development and conservation goals into viable plans for developing and marketing agriculture and horticulture products and services
- develop competencies and behaviours that have broad application to environmental career paths, and specific application to careers within Alberta's agriculture and horticulture industries.

SCOPE AND SEQUENCE



—— Prerequisite

- - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.

MODULE LEARNER EXPECTATIONS: INTRODUCTORY LEVEL

MODULE AGR1010: AGRICULTURE: THE BIG PICTURE

Level: Introductory

Theme: Social and Cultural Perspectives

Prerequisite: None

Module Description: Students demonstrate knowledge of the diversity and significance of agriculture, and they identify career opportunities within the industry.

Module Learner Expectations: *The student will:*

- describe the diversity of agriculture activity in Alberta, Canada and the global community
- explain the economic, environmental and social significance of agriculture
- identify career opportunities relevant to the agriculture industry
- demonstrate basic competencies.

MODULE AGR1030: PRODUCTION BASICS

Level: Introductory

Theme: Technology and Applications

Prerequisite: None

Module Description: Students demonstrate the basic steps involved in planting, growing and harvesting a plant commodity or in raising, growing and finishing an animal commodity; and they identify related career opportunities.

Module Learner Expectations: *The student will:*

- identify and demonstrate the basic steps and procedures involved in producing a plant or animal commodity
- describe technological systems used within a plant or animal production enterprise
- identify career opportunities relevant to plant or animal production
- demonstrate basic competencies.

MODULE AGR1060: CONSUMER PRODUCTS & SERVICES

Level: Introductory

Theme: Technology and Applications

Prerequisite: None

Module Description: Students demonstrate the basic steps involved in processing (adding value to) an agriculture commodity and/or in providing related services, and they identify career opportunities in agriculture processing.

Module Learner Expectations: *The student will:*

- explain the basic steps and procedures involved in processing an agriculture commodity and/or in providing a related service
- describe technological systems used to process a plant or animal commodity and/or to provide a related service
- identify career opportunities relevant to processing agriculture or horticulture products and/or to providing related services
- demonstrate basic competencies.

MODULE AGR1070: BASIC LANDSCAPE/TURF CARE

Level: Introductory

Theme: Technology and Applications

Prerequisite: None

Module Description: Students demonstrate knowledge of the techniques used to perform basic landscape and turf care services, focusing attention on plant identification, equipment and supplies and basic maintenance tasks; and they identify related career opportunities.

Module Learner Expectations: *The student will:*

- identify plants suitable for use in Alberta landscapes
- describe equipment and supplies used in performing basic landscape and turf-care services
- demonstrate practical skills in performing basic landscape and turf-care services
- identify career opportunities relevant to landscape and turf maintenance
- demonstrate basic competencies.

MODULE AGR1080: BASIC FLORAL DESIGN

Level: Introductory

Theme: Technology and Applications

Prerequisite: None

Module Description: Students demonstrate knowledge of the techniques used to construct basic floral designs and arrangements, focusing attention on plant and flower identification, care and handling of fresh cut flowers and foliage, and simple fresh/dried/artificial arrangements; and they identify related career opportunities.

Module Learner Expectations: *The student will:*

- identify and explain the cultural requirements of cut flowers, foliage and interior plants
- demonstrate appropriate care and handling of fresh cut flowers and foliage
- construct simple floral arrangements
- identify career opportunities relevant to the retail florist industry
- demonstrate basic competencies.

MODULE AGR1090: MARKET FUNDAMENTALS

Level: Introductory

Theme: Technology and Applications

Prerequisite: None

Module Description: Students explain the basic principles involved in marketing a plant or animal product or service, and they identify related career opportunities.

Module Learner Expectations: *The student will:*

- explain basic principles involved in marketing an agriculture/horticulture commodity, product or service
- explain how agriculture/horticulture markets are expanded and existing products are altered to meet the needs of new markets
- identify career opportunities relevant to marketing an agriculture/horticulture commodity, product or service
- demonstrate basic competencies.

MODULE AGR1100: AGRICULTURE TECHNOLOGY

Level: Introductory

Theme: Technology and Applications

Prerequisite: None

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

Module Learner Expectations: *The student will:*

- explain how science and technology influence the development of agriculture products, methods and services
- describe current applications of science and technology in agriculture production, processing and marketing
- design a simple technological system that addresses a current need in agriculture
- demonstrate basic competencies.

MODULE AGR1110: RESOURCE MANAGEMENT

Level: Introductory

Theme: Management and Conservation

Prerequisite: None

Module Description: Students describe the practices used to manage water, soil and land use; and they present the results of research on one or more related issues in agriculture.

Module Learner Expectations: *The student will:*

- describe the nature and extent of Alberta's water resource, and explain practices for managing its use
- describe the nature and characteristics of soil in Alberta, and explain practices for managing its use
- explain different uses of land in rural and urban Alberta and the factors upon which land use decisions are made
- identify alternatives and consequences associated with one or more issues involving water, soil or land use in agriculture
- demonstrate basic competencies.

MODULE LEARNER EXPECTATIONS: INTERMEDIATE LEVEL

MODULE AGR2020: ANIMAL HUSBANDRY/WELFARE

Level: Intermediate

Theme: Social and Cultural Perspectives

Prerequisite: None

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

Module Learner Expectations: *The student will:*

- identify and describe indicators of health in a domestic animal and factors that contribute to a healthy animal environment
- demonstrate practical skills in providing care for a domestic animal
- present a rationale and strategy for addressing animal welfare
- demonstrate basic competencies.

MODULE AGR2030: FIELD CROPS 1 (MATERIALS & PROCESSES)

Level: Intermediate

Theme: Technology and Applications

Prerequisite: None

Module Description: Students apply knowledge of materials and processes in growing a field crop, focusing attention on plant anatomy and identification, growth requirements, physical structures and equipment and practical production tasks; and they identify related career opportunities. Potential areas of specialization include the production of cereals, forage, oil seeds, pulse crops, mushrooms, spices/herbs, vegetables, fruits, medicinal plants and exotic plants.

Module Learner Expectations: *The student will:*

- identify and describe field crop species suited to Alberta climates
- demonstrate knowledge and safe use of basic equipment used in crop production
- demonstrate practical skills in planting, growing and/or harvesting a field crop
- describe career opportunities relevant to field crop production
- demonstrate basic competencies.

MODULE AGR2040: LIVESTOCK/POULTRY 1 (MATERIALS & PROCESSES)

Level: Intermediate

Theme: Technology and Applications

Prerequisite: None

Module Description: Students apply knowledge of materials and processes in raising livestock, poultry or other animal commodities, focusing attention on anatomy and identification, rations and feeding, housing, animal handling and restraint, animal health and welfare, and care for the young; and they identify related career opportunities. Potential areas of specialization include the production of beef, dairy, poultry, swine, sheep, game, exotics and bees and/or the study of aquaculture.

Module Learner Expectations: *The student will:*

- describe the basic anatomy, physiology and breeds of cattle (beef or dairy), sheep, swine, poultry or specialty animals
- demonstrate practical skills in raising, growing and finishing cattle (beef or dairy), sheep, swine, poultry or specialty animals
- demonstrate appropriate use of basic structures and equipment in animal production
- describe career opportunities relevant to beef, dairy, sheep, swine, poultry or specialty animal production
- demonstrate basic competencies.

MODULE AGR2050: AGRIFOODS 1 (MATERIALS & PROCESSES)

Level: Intermediate

Theme: Technology and Applications

Prerequisite: None

Module Description: Students demonstrate knowledge of materials and processes used in producing an agrifood product or in providing a related service, focusing attention on industry inputs, and processing technologies and practices; and they identify related career opportunities. Potential areas of investigation include dairy, beef, pork, poultry, cereals, oil seeds, sugar beets, wine, fruits/vegetables and honey.

Module Learner Expectations: *The student will:*

- describe the range of input materials, food products and/or related services characteristic of an agrifood industry
- explain technologies and practices used in processing an agriculture food product or in providing a related service
- describe career opportunities relevant to the agrifood industry
- demonstrate basic competencies.

MODULE AGR2060: LANDSCAPE/TURF MANAGEMENT 1 (MAINTENANCE PRACTICES)

Level: Intermediate

Theme: Technology and Applications

Prerequisite: AGR1070 Basic Landscape/Turf Care

Module Description: Students demonstrate the techniques used to provide landscape and turf maintenance services, focusing attention on plant identification, equipment maintenance, effective landscape practices, cost analysis and pricing. Potential areas of specialization include home landscapes, golf courses, recreational fields and parks, institutional/industrial grounds and roadside landscapes.

Module Learner Expectations: *The student will:*

- identify plants suitable for use in Alberta landscapes
- perform routine maintenance and safety checks on equipment used in landscape practices
- demonstrate practical skills in installing and maintaining landscape plants and turfgrass
- explain techniques used to cost landscape and turfgrass services
- demonstrate basic competencies.

MODULE AGR2070: EQUINE 1 (MATERIALS & PROCESSES)

Level: Intermediate

Theme: Technology and Applications

Prerequisite: None

Module Description: Students demonstrate practical skills and approved practices in providing for the daily care of a horse, focusing attention on the origin and history of horses, anatomy and conformation, types and breeds, handling and feeding practices, and basic health care; and they identify related career opportunities.

Module Learner Expectations: *The student will:*

- describe the significance, origin and conformational features of the horse
- identify the types, breeds and characteristics of horses
- demonstrate practical skills and approved procedures for horse handling, feeding and health care
- describe career opportunities relevant to the care, breeding and training of horses
- demonstrate basic competencies.

MODULE AGR2080: FLORAL DESIGN 1 (PROJECTS FOR ALL OCCASIONS)

Level: Intermediate

Theme: Technology and Applications

Prerequisite: AGR1080 Basic Floral Design

Module Description: Students demonstrate knowledge of the practices involved in providing floral design and interior plantscape services, focusing attention on plant and flower identification, elements and principles of design, floral projects for all occasions, interior plant care and marketing practices.

Module Learner Expectations: *The student will:*

- identify and explain the cultural requirements of cut flowers, foliage and interior plants
- construct fresh, dried and/or artificial floral arrangements
- demonstrate practical skills in maintaining indoor plantscapes
- explain techniques used to cost products within the floral industry
- demonstrate basic competencies.

MODULE AGR2090: MARKETING 1 (OPEN MARKETING STRUCTURES)

Level: Intermediate

Theme: Technology and Applications

Prerequisite: None

Module Description: Students apply knowledge of general marketing principles within the context of an agriculture or horticulture industry, focusing attention on materials and services offered to the consumer through open (free enterprise) marketing structures and marketing techniques; and they identify related career opportunities.

Module Learner Expectations: *The student will:*

- develop and present a plan for marketing an agriculture/horticulture commodity, product or service through an open (free enterprise) marketing structure
- describe career opportunities and the range of employment opportunities relevant to marketing an agriculture/horticulture commodity, product or service
- demonstrate basic competencies.

MODULE AGR2100: PROTECTED STRUCTURES

Level: Intermediate

Theme: Technology and Applications

Prerequisite: None

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

Module Learner Expectations: *The student will:*

- identify and explain essential components of controlled growing/living environments
- describe ways in which controlled growing/living environments can be adapted for crop production or livestock housing
- demonstrate techniques used to regulate and manage growing environments within a protected structure
- demonstrate basic competencies.

MODULE AGR2120: SOILS MANAGEMENT 1 (SOIL PROPERTIES/CLASSIFICATION)

Level: Intermediate

Theme: Management and Conservation

Prerequisite: None

Module Description: Students examine soil formation and classification, conduct tests to determine the physical and chemical properties of soils, and they explain the impact of soil properties on productivity.

Module Learner Expectations: *The student will:*

- describe the origin and composition of soils in Western Canada
- identify physical properties of soils, and describe their relationship to soil productivity
- identify chemical properties of soils, and describe their relationship to soil productivity
- demonstrate basic competencies.

MODULE AGR2130: INTEGRATED PEST MANAGEMENT

Level: Intermediate

Theme: Management and Conservation

Prerequisite: None

Module Description: Students apply knowledge of biological, cultural and chemical pest-control measures within the context of an agriculture, horticulture or forest industry.

Module Learner Expectations: *The student will:*

- describe the life cycle and ecology of common pests in an agriculture, horticulture or forest industry
- describe biological, cultural and chemical pest-control strategies and basic principles of integrated pest management
- explain legislation and policies regarding the safe handling, storage and use of chemical and biological control agents
- develop and implement an integrated pest management program
- demonstrate basic competencies.

MODULE AGR2140: NURSERY/GREENHOUSE CROPS 1 (MATERIALS & PROCESSES)

Level: Intermediate

Theme: Technology and Applications

Prerequisite: None

Module Description: Students apply knowledge of materials and processes in growing a nursery or greenhouse crop, focusing attention on plant anatomy and identification, growth requirements, physical structures and equipment, and practical production tasks; and they identify related career opportunities.

Module Learner Expectations: *The student will:*

- identify and describe nursery or greenhouse plants suited to Alberta climates
- describe hand and power equipment and related supplies used in nursery or greenhouse crop production
- demonstrate practical skills in growing a nursery or greenhouse crop
- describe career opportunities relevant to nursery or greenhouse crop production
- demonstrate basic competencies.

MODULE LEARNER EXPECTATIONS: ADVANCED LEVEL

MODULE AGR3010: ISSUES IN AGRICULTURE

Level: Advanced

Theme: Social and Cultural Perspectives

Prerequisite: None

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

Module Learner Expectations: *The student will:*

- analyze a range of economic, environmental and social issues in agriculture
- compare and contrast issues that involve agriculture in Alberta and Canada with similar issues at a global level
- present a plan of action to address a complex issue in agriculture
- demonstrate basic competencies.

MODULE AGR3030: FIELD CROPS 2 (MANAGEMENT TECHNIQUES)

Level: Advanced

Theme: Technology and Applications

Prerequisite: AGR2030 Field Crops 1 (Materials & Processes)

Module Description: Students demonstrate the techniques used to produce a field crop, focusing attention on industry trends, enterprise 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.

Module Learner Expectations: *The student will:*

- identify trends in the production and use of new varieties of field crops
- describe principles of genetics and reproduction, and explain their application to field crop species
- demonstrate practical skills in producing a field crop
- demonstrate basic competencies.

MODULE AGR3040: LIVESTOCK/POULTRY 2 (MANAGEMENT TECHNIQUES)

Level: Advanced

Theme: Technology and Applications

Prerequisite: AGR2040 Livestock/Poultry 1 (Materials & Processes)

Module Description: Students demonstrate the techniques used to manage production of livestock, poultry or other animal commodities, focusing attention on 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 beef, dairy, poultry, swine, sheep, game, exotics and bees and/or the study of aquaculture.

Module Learner Expectations: *The student will:*

- identify industry trends in beef, dairy, sheep, swine, poultry or specialty animal production
- describe principles of genetics and reproduction, and explain their application to cattle (beef or dairy), sheep, swine, poultry or specialty animals
- demonstrate practical skills in raising, growing and finishing cattle (beef or dairy), sheep, swine, poultry or specialty animals
- demonstrate basic competencies.

MODULE AGR3050: AGRIFOODS 2 (STANDARDS & REGULATION)

Level: Advanced

Theme: Technology and Applications

Prerequisite: AGR2050 Agrifoods 1 (Materials & Processes)

Module Description: Students demonstrate the knowledge of techniques used to manage the 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 dairy, beef, pork, poultry, cereals, oil seeds, sugar beets, wine, fruits/vegetables and honey.

Module Learner Expectations: *The student will:*

- identify government legislation and policies that regulate practices within an agrifood industry
- describe techniques used to manage industry practices, including the application of economic principles, product quality and safety, and environmental impact
- identify industry trends and opportunities for developing new agrifood products
- demonstrate basic competencies.

MODULE AGR3060: LANDSCAPE/TURF MANAGEMENT 2 (INSTALLATION & REPAIR)

Level: Advanced

Theme: Technology and Applications

Prerequisite: AGR2060 Landscape/Turf Management 1 (Maintenance Practices)

Module Description: Students demonstrate the techniques used to provide landscape and turf management services, focusing attention on plant identification, effective maintenance practices, diagnosis and correction of problems, installation of specialty items, cost analysis and seasonal estimates. Potential areas of specialization include home landscapes, golf courses, recreational fields and parks, institutional/industrial grounds and roadside landscapes.

Module Learner Expectations: *The student will:*

- identify plants suitable for use in Alberta landscapes
- demonstrate practical skills in installing, maintaining and managing landscape plants and turfgrass
- develop and present a plan for the installation of a specialty item and/or system within an Alberta landscape
- estimate the cost of providing seasonal landscape and/or turfgrass services
- demonstrate basic competencies.

MODULE AGR3070: EQUINE 2 (MANAGEMENT TECHNIQUES)

Level: Advanced

Theme: Technology and Applications

Prerequisite: AGR2070 Equine 1 (Materials & Processes)

Module Description: Students demonstrate practical skills and approved practices in providing for the daily care of a horse, focusing attention 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.

Module Learner Expectations: *The student will:*

- identify factors to consider in selecting a stable and other physical facilities
- demonstrate practical skills and approved procedures for stall cleaning, bedding a horse, turnout and shelter
- describe the reproductive cycle of horses, and describe basic techniques of equine reproduction
- demonstrate approved horsemanship techniques
- demonstrate basic competencies.

MODULE AGR3080: FLORAL DESIGN 2 (CREATIVE DESIGN & DISPLAY)

Level: Advanced

Theme: Technology and Applications

Prerequisite: AGR2080 Floral Design 1 (Projects for All Occasions)

Module Description: Students demonstrate knowledge of the practices involved in providing creative floral design services, focusing attention on plant and flower identification, more advanced design techniques, floral services for special occasions and promotional displays of floral services offered.

Module Learner Expectations: *The student will:*

- identify and explain the cultural requirements of cut flowers, foliage and interior plants
- construct fresh, dried and/or artificial floral arrangements for special occasions
- calculate the cost and selling price of floral products and services
- demonstrate techniques used to promote products and services within the floral industry
- demonstrate basic competencies.

MODULE AGR3090: MARKETING 2 (CLOSED MARKETING STRUCTURES)

Level: Advanced

Theme: Technology and Applications

Prerequisite: AGR2090 Marketing 1 (Open Marketing Structures)

Module Description: Students explain specialized applications of marketing within closed (supply managed) marketing structures, focusing attention on regulatory agencies/policies that influence the supply of a commodity, product or service.

Module Learner Expectations: *The student will:*

- describe general characteristics and applications of marketing within a closed (supply managed) marketing structure
- assess the benefits and costs of open (free enterprise) and closed (supply managed) marketing systems
- explain factors that affect decisions to produce and market an agriculture commodity within a closed (supply managed) marketing structure
- demonstrate basic competencies.

MODULE AGR3100: BIOTECHNOLOGY

Level: Advanced

Theme: Technology and Applications

Prerequisite: None

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

Module Learner Expectations: *The student will:*

- describe the history and development of biotechnology
- identify the benefits and costs associated with applications of biotechnology in agriculture and food production
- explain the processes used to develop a recent biotechnology within Alberta's agriculture industry
- demonstrate basic competencies.

MODULE AGR3110: WATER MANAGEMENT

Level: Advanced

Theme: Management and Conservation

Prerequisite: None

Module Description: Students explain principles of water management and establish appropriate water management practices for an agriculture or horticulture enterprise.

Module Learner Expectations: *The student will:*

- describe the hydrologic cycle
- identify water sources important to agriculture in Alberta
- explain how agriculture affects water resources at local and global levels
- identify water quality factors and techniques used to manage water for the benefit of agriculture and the environment
- demonstrate basic competencies.

MODULE AGR3120: SOILS MANAGEMENT 2 (SOIL TESTING & AMENDING)

Level: Advanced

Theme: Management and Conservation

Prerequisite: AGR2120 Soils Management 1 (Soil Properties/Classification)

Module Description: Students demonstrate knowledge of appropriate soil testing and amending techniques, and they interpret soil survey maps and reports.

Module Learner Expectations: *The student will:*

- select appropriate fertilization techniques based on an analysis of the nutrient requirements of plants
- demonstrate appropriate soil sampling techniques, and interpret soil test reports
- describe the legal location of a parcel of land, using the Western Grid Survey System
- read and interpret soil survey maps and reports
- demonstrate basic competencies.

MODULE AGR3130: SUSTAINABLE AGRICULTURE SYSTEMS

Level: Advanced

Theme: Management and Conservation

Prerequisite: None

Module Description: Students examine the impact of a range of agriculture practices on the environment, and they propose strategies for ensuring the sustainable use of natural resources.

Module Learner Expectations: *The student will:*

- describe the structure and functioning of ecosystems
- explain potential impacts of agriculture systems on the environment
- develop and present strategies for ensuring the sustainable use of natural resources
- demonstrate basic competencies.

MODULE AGR3140: NURSERY/GREENHOUSE CROPS 2 (MANAGEMENT TECHNIQUES)

Level: Advanced

Theme: Technology and Applications

Prerequisite: AGR2140 Nursery/Greenhouse Crops 1 (Materials & Processes)

Module Description: Students demonstrate techniques used to produce a nursery or greenhouse crop, focusing attention on enterprise selection, plant identification, genetics and reproduction, production skills and venture analysis.

Module Learner Expectations: *The student will:*

- identify and assess opportunities for producing a nursery or greenhouse crop
- identify and describe nursery or greenhouse plants suited to Alberta climates
- demonstrate practical skills in producing a nursery or greenhouse crop
- develop and present a plan for future nursery or greenhouse crop production, based on the outcomes of current production practices
- demonstrate basic competencies.