
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	30
3. Communication Technology	33
4. Community Health	31
5. Construction Technologies	46
6. Cosmetology Studies	58
7. Design Studies	31
8. Electro-Technologies	47
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	23
20. Mechanics	54
21. Tourism Studies	24
22. Wildlife	17

LEVELS OF ACHIEVEMENT

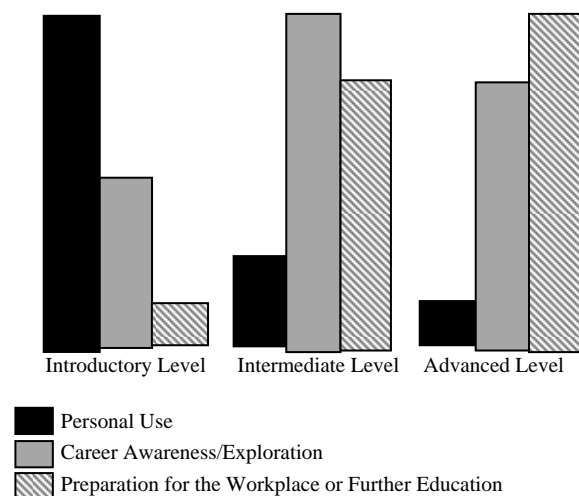
Courses are organized into three levels of achievement: **introductory**, **intermediate** and **advanced**. As students progress through the levels, they will be expected to meet higher standards and demonstrate an increased degree of competence, in both the program outcomes and the general outcomes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

DESIGN STUDIES

B. STRAND RATIONALE AND PHILOSOPHY

Design is an integral part of our society. It permeates every facet of civilization, sometimes in complex ways, many times quite simply. Everyone designs every day. Design brings a sense of order to our world. Young children in play design physical structures, visual images and systems of organization. Professional designers create these and many other things. Signs, displays, packages, road systems, computer games, furniture, automobiles, clothing, banquets, houses and highrises are a few examples of work produced by professional designers.

Students may not become professional designers, but they still engage in design in some way. Design Studies, a strand in Career and Technology Studies, helps students become aware of design in their environment, engages them in designing, and shows them how design processes may be used in many contexts. Being aware of and appreciating the importance of design helps students become effective members of society.

Design can be described as a “creative problem-solving process, which begins with identifying a specific human need and results, ideally, in a product or situation that improves or enhances some aspect of our lives.”★ Design can be both a noun and a verb. As a noun, design can describe a condition, as in the statement “. . . your design

shows creativity.” As a verb, design suggests a process or problem-solving activity, as in the statement “. . . I need to design a container to carry water.” Design Studies students work primarily in the context of design as a verb.

All students are expected to develop problem-solving skills through their school experience. Design Studies deals specifically with solving problems in a variety of contexts, and is limited only by facility or imagination. Design Studies students may be expected to solve visual problems, structural problems and organizational problems using the context of their environment, their other classes and their community experiences. This ability to solve problems will be applied by Design Studies students to situations in their daily lives, in their workplace activities and in post-secondary studies. The theoretical and practical learning of processes, tools and technologies used during Design Studies is relevant, because the learning occurs in context.

There are many reasons for students to engage in Design Studies. For example, students may wish to:

- develop and apply creative abilities and aesthetic awareness
- develop investigative and research skills

★ Definition taken from *What Is Design?* Edmonton, AB: Alberta Culture and Multiculturalism.

- develop problem-solving abilities
- develop the ability to select an appropriate medium, model a solution and effectively communicate the solution to others
- recognize the importance of design in the human environment, and its impact upon the natural environment
- appreciate the relationship between aesthetics, function, materials and processes
- become aware of the many factors that have to be taken into account in order to achieve appropriate and effective design solutions
- use appropriate technology to arrive at design solutions
- create innovative approaches, products and systems
- recognize significant historical events in design, and describe how they have influenced subsequent design developments
- be better able to pursue a design career.

Design may be studied in its own right or it may be incorporated into other curricula. Key features of Design Studies and other design-based programs are to:

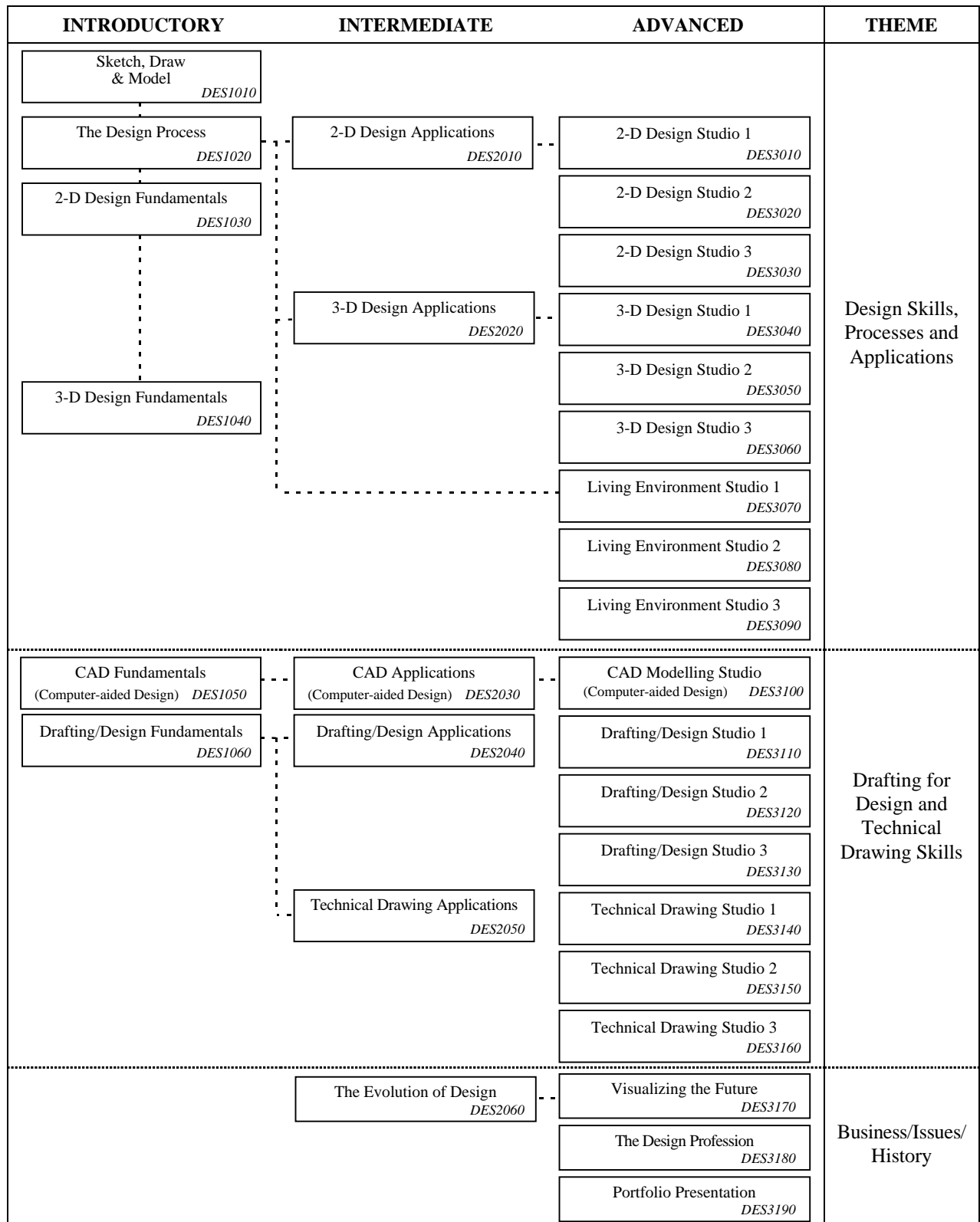
- encourage and facilitate students to be creative, innovative and curious
- teach students to identify and solve many different kinds of design challenges
- incorporate student-directed learning
- teach teamwork strategies and skills
- apply theory within a context
- use technology appropriately and effectively
- teach safe and effective work practices
- appreciate appropriate attitudes, such as pursuing and valuing quality, ethics, professionalism, attention to detail and perseverance and understanding the discipline of design
- encourage cross-curricular links

- reach beyond the school to the community, to create links, projects and contacts with designers, local groups, professionals and businesses.

Within the philosophy of Career and Technology Studies, *students* in Design Studies *will*:

- demonstrate creativity and innovation
- demonstrate aesthetic awareness
- use historical research as one basis for design activity
- identify and solve problems
- work in two and three dimensions
- work individually and as members of a team
- recognize the value of technology, and use it appropriately and effectively
- demonstrate and practise safe and effective work habits and attitudes
- develop and apply personal and interpersonal, verbal and nonverbal communication and presentation skills
- develop the ability to recognize, appreciate and create appropriate design solutions
- appreciate that designers may confront ethical, legal and moral issues in their work
- appreciate that design has an impact upon the environment
- develop a working knowledge of tools, materials and processes associated with specific tasks
- develop and maintain a design journal
- develop and maintain a portfolio of design solutions.

SCOPE AND SEQUENCE



—— Prerequisite

- - - - Recommended sequence

MODULE LEARNER EXPECTATIONS: INTRODUCTORY LEVEL

MODULE DES1010: SKETCH, DRAW & MODEL

Level: Introductory

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students are introduced to observational sketching and drawing, and modelling, and to a selection of materials and tools and their uses. Students also develop skills that can be used and enhanced in further design activity.

Module Learner Expectations: *The student will:*

- sketch, manually, and draw and model, natural and manufactured three-dimensional forms
- use manual sketching/drawing and modelling materials, and tools effectively
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES1020: THE DESIGN PROCESS

Level: Introductory

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students begin this process-based activity by developing an understanding of the problem through research. They then develop possible solutions, working through them to arrive at a final, appropriate solution.

Module Learner Expectations: *The student will:*

- identify a design process and apply it throughout the instructional period
- produce a designed solution
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES1030: 2-D DESIGN FUNDAMENTALS

Level: Introductory

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students develop skills and techniques appropriate to two-dimensional design by engaging in a variety of activities in various contexts. Techniques may include drawing, layout, use of tools and equipment appropriate to two-dimensional design, cutting, joining, measuring and use of notations.

Module Learner Expectations: *The student will:*

- identify and practise two-dimensional design techniques; e.g., layout, use of grids, use of typography
- identify and use materials and tools common to two-dimensional design; e.g., card, cutting tools, computer graphics packages
- identify, select and use elements and principles of design in project activities
- use two-dimensional design techniques to solve simple design problems; e.g., advertisement layout, greeting cards, sign, poster, package graphics
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES1040: 3-D DESIGN FUNDAMENTALS

Level: Introductory

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students develop skills and techniques appropriate to three-dimensional design by engaging in a variety of activities in various contexts. Techniques may include drawing, modelling, use of tools and equipment appropriate to three-dimensional design, cutting, joining, measuring and use of notations.

Module Learner Expectations: *The student will:*

- identify and practise three-dimensional design techniques; e.g., cutting, joining, manipulating
- identify and use materials and tools common to three-dimensional design; e.g., cardboard, plastic, wood, styrofoam, wire, modelling clay
- identify, select and use elements and principles of design in project activities
- use three-dimensional design techniques to solve simple design problems; e.g., simple bridging structures, container, pencil holder
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES1050: CAD FUNDAMENTALS (COMPUTER-AIDED DESIGN)

Level: Introductory

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students develop basic knowledge and skills in computer-aided design (CAD).

Module Learner *The student will:*

Expectations:

- demonstrate basic knowledge and skills required to operate CAD software
- use CAD to produce and print/plot a multiview drawing and/or pictorial drawing and/or surface development
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES1060: DRAFTING/DESIGN FUNDAMENTALS

Level: Introductory

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students develop basic knowledge, skills and techniques to draft appropriate drawings for visualizing and illustrating simple design problems.

Module Learner *The student will:*

Expectations:

- produce pictorial representations and multiview drawings from sketches and/or three-dimensional objects
- OR
- produce pictorial representations and surface developments for items in context; e.g., garments, sheet metal fabrication, packaging
 - select, organize and present design projects
 - demonstrate basic competencies.

MODULE LEARNER EXPECTATIONS: INTERMEDIATE LEVEL

MODULE DES2010: 2-D DESIGN APPLICATIONS

Level: Intermediate

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students apply the design process and other knowledge, skills and processes learned at the introductory level to two-dimensional design projects. Projects in this module typically deal with communication problems and issues. Students take greater responsibility for managing their learning and learn to work cooperatively with others.

Module Learner Expectations: *The student will:*

- plan and produce solutions to intermediate level two-dimensional design briefs
- use, effectively, the elements and principles of design
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES2020: 3-D DESIGN APPLICATIONS

Level: Intermediate

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students apply the design process and other knowledge, skills and processes learned at the introductory level to three-dimensional design projects. Projects in this module typically deal with problems and issues related to product design. Students take greater responsibility for managing their learning and learn to work cooperatively with others.

Module Learner Expectations: *The student will:*

- plan and produce solutions to intermediate level three-dimensional design briefs
- use, effectively, the elements and principles of design
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES2030: CAD APPLICATIONS (COMPUTER-AIDED DESIGN)

Level: Intermediate

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students apply their previous learnings, and add knowledge, skills and techniques associated with computer-aided design (CAD) to the context of new design-related tasks.

Module Learner Expectations: *The student will:*

- use CAD software to produce and print/plot intermediate level multiview and/or pictorial drawings and/or surface developments
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES2040: DRAFTING/DESIGN APPLICATIONS

Level: Intermediate

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students learn skills in assembly, section and/or auxiliary drawing. They further develop the knowledge, skills and techniques; e.g., pictorial drawings, multiview drawings, surface developments (flat patterns), and by applying them in the context of more complex design projects.

Module Learner Expectations: *The student will:*

- produce pictorial drawings; e.g., isometric, oblique, one- and two-point perspective, using rendering styles and techniques; e.g., pencil, ink, colour, computer generated, within the context of design projects
 - produce at least two types of drawings chosen from assembly, section or auxiliary, either manually or with the aid of a computer
 - produce dimensioned multiview drawings, either manually or with the aid of a computer
- OR
- produce surface developments for items; e.g., garments, sheet metal, packaging, manually or with the aid of a computer
 - select, organize and present design projects
 - demonstrate basic competencies.

MODULE DES2050: TECHNICAL DRAWING APPLICATIONS

Level: Intermediate

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students develop accurate multiview drawings from previously produced sketches, and learn the common understandings, conventions and language associated with technical drawing.

Module Learner Expectations: *The student will:*

- produce technical drawings for simple structures, products and/or components
- dimension and notate drawings accurately
- identify and include to all pertinent codes and specifications as they apply to drawings produced
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES2060: THE EVOLUTION OF DESIGN

Level: Intermediate

Theme: Business/Issues/History

Prerequisite: None

Module Description: Students develop a historical framework for the importance and relevance of design within a cultural context, by examining past and contemporary examples of designed artifacts.

Module Learner Expectations: *The student will:*

- demonstrate knowledge of historical and contemporary design resources
- make a formal presentation of research findings
- select, organize and present design projects
- demonstrate basic competencies.

MODULE LEARNER EXPECTATIONS: ADVANCED LEVEL

MODULE DES3010: 2-D DESIGN STUDIO 1

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students apply theories, skills and techniques of organization of the visual image onto the two-dimensional format, to resolve complex design problems. Emphasis is placed on exploring form, composition and aesthetics of communication design solutions.

Module Learner Expectations: *The student will:*

- produce advanced level designed solutions for two-dimensional design problems
- apply elements and principles of design to two-dimensional design compositions
- make rational judgements for achieving aesthetic quality in two-dimensional design solutions
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3020: 2-D DESIGN STUDIO 2

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students investigate the impact, importance and influence of two-dimensional design within a cultural context and the social responsibility of the designer, and apply this information when resolving complex communication design problems.

Module Learner Expectations: *The student will:*

- produce advanced level designed solutions for two-dimensional communication design problems
- identify examples of effective and ineffective two-dimensional designs
- identify human factors commonly affected by two-dimensional design solutions and accommodate these within designed solutions
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3030: 2-D DESIGN STUDIO 3

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students explore the production processes of two-dimensional design and the role of the designer as an organizer of appropriate materials, processes and systems. This understanding is applied in the resolution of complex two-dimensional design problems.

Module Learner Expectations: *The student will:*

- produce advanced level designed solutions for two-dimensional design problems involving materials and production processes
- select materials based on their properties and justify their use in the context of two-dimensional design; e.g., what works in a given situation to achieve a desired affect
- design and/or select and use a process to reproduce a two-dimensional product in quantity
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3040: 3-D DESIGN STUDIO 1

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students deal with such aspects as shaping, massing, proportion, scale, contrast, colour, texture and finish within the context of complex three-dimensional design projects.

Module Learner Expectations: *The student will:*

- produce advanced level designed solutions for three-dimensional design problems
- use elements, principles and considerations common to three-dimensional compositions
- use various materials, and the required processes to shape and join such materials, and to create desired forms
- demonstrate familiarity with symbolic and cultural connotations of design, and make aesthetic judgements about design solutions generated
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3050: 3-D DESIGN STUDIO 2

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students are introduced to human factors, principles and considerations; e.g., ergonomics, semantics and semiotics.

Module Learner Expectations: *The student will:*

- apply human factors, principles and considerations; i.e., physical, auditory, visual, when designing, which results in a three-dimensional product for human use
- explain the relationships among the application of human factors, principles and considerations and the articulation (system, sequence) of a product design
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3060: 3-D DESIGN STUDIO 3

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students expand their knowledge of materials, technologies and production/processes employed to shape and join materials and assemble products. Students become familiar with principles of manufacturing, and materials, technologies and processes appropriate to manufacturing a product in various production quantities.

Module Learner Expectations: *The student will:*

- use materials, technologies and production processes relevant to a particular area of three-dimensional design to produce a product
- apply appropriate materials and processes to form, shape, join, fasten, assemble and/or construct with various materials based on their properties on advanced level three-dimensional project
- describe the relationship among materials, production processes and intended production quantities, and the manner in which a product is designed
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3070: LIVING ENVIRONMENT STUDIO 1

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students learn to develop appropriate architectural, environmental or interior design solutions for specific human needs. Students also learn to use design methodology and teamwork in the development of such solutions.

Module Learner Expectations: *The student will:*

- produce creative designed solutions based in architectural, environmental and/or interior design, that address human and/or environmental needs
- use elements, principles and processes of design to deal with identified human and/or environmental needs within design solutions
- describe how human and environmental requirements affect design
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3080: LIVING ENVIRONMENT STUDIO 2

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students learn to consider form and space when developing specific architectural, environmental or interior design solutions specific to human and/or environmental needs. They assess solutions on the basis of functional and aesthetic considerations and appropriateness within the human environment. Materials and production processes may be considered at this stage though not necessarily resolved. When designing at the micro level, students consider the ergonomic aspects of design.

Module Learner Expectations: *The student will:*

- produce advanced level designed solutions for problems in one or more living environment themes: architectural design, environmental design, interior design
- apply elements and principles of design; e.g., space, form, and ergonomics within architectural, environmental and/or interior design
- make rational judgements with respect to aesthetic quality in architectural, environmental or interior design
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3090: LIVING ENVIRONMENT STUDIO 3

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Description: Students develop design solutions specific to architectural, environmental or interior design, and learn about using and/or specifying appropriate materials and production processes.

Module Learner Expectations: *The student will:*

- use appropriate materials and production processes to resolve set design problems
- identify materials and products used in architectural, environmental and/or interior design, and give reasons for their use based on their properties
- identify and/or specify production processes, and/or methods of manufacturing products common to architectural, environmental and/or interior design
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3100: CAD MODELLING STUDIO (COMPUTER-AIDED DESIGN)

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students solve design problems, using advanced computer-aided design (CAD) methods, advanced commands, three-dimensional modelling techniques, rendering, shading and animation techniques.

Module Learner Expectations: *The student will:*

- use advanced CAD commands and techniques to design working prototypes of solutions to advanced level design problems
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3110: DRAFTING/DESIGN STUDIO 1

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students concentrate on various drawing and drafting types to illustrate design concepts and solutions, including freehand drawings, illustrative views, isometric drawings, perspective drawings, axiometric drawings, surface developments (flat pattern). This is a skill-building module with the emphasis on line drawing.

Module Learner Expectations: *The student will:*

- use freehand and mechanical and/or computer-aided drafting techniques to produce solutions for complex projects in areas such as architecture, fashion, product, furniture and/or other design applications
- apply various drawing construction principles to produce pictorial drawings; e.g., isometric, perspective and axiometric
- apply design detailing, and make rational judgements with respect to proportion, scale, composition, codes and standards
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3120: DRAFTING/DESIGN STUDIO 2

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students develop complex explanatory drawings from base (line) drawings, that may include exploded views, cut-aways, revolutions, sectional, and shadow and reflection construction. This is a skill-building module with the emphasis on explanatory line drawings.

Module Learner Expectations: *The student will:*

- use explanatory drawing techniques; e.g., exploded views, cut-away views, shadow and reflection construction, to convey and communicate complex design solutions
- use appropriate drawing techniques to illustrate principles of assembly, such as mechanical function, usage
- use principles of communication through illustrative drawing and detailing; e.g., attention to the composition of exploded views, optimizing location of cut-away sections
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3130: DRAFTING/DESIGN STUDIO 3

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students apply rendering techniques to line drawings (base or developed), concentrating on light, colour and various media; e.g., coloured pencils, marker pens, water colours, computer rendered. Presentation techniques are used to compose high quality illustrations to communicate design solution, such as rendered drawings, context backgrounds, collage and montage techniques, titles, text.

Module Learner Expectations: *The student will:*

- use various rendering techniques and media to create high quality visual representations of design solutions
- create well-composed presentations of design solutions, using a combination of materials and methods, such as rendered drawings, photographs, text, theme boards, CAD, video
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3140: TECHNICAL DRAWING STUDIO 1

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students produce sections, elevations and auxiliary drawings, and build upon their learnings from the intermediate level. Students may use previously produced sketches and multiview drawings as a basis for further work.

Module Learner Expectations: *The student will:*

- produce detailed section, elevation and auxiliary views for fabrication, manufacturing and/or construction
- identify and use codes, specifications and conventions as they apply in the drawings produced
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3150: TECHNICAL DRAWING STUDIO 2

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students identify and specify details of various product components with a focus on representations of developments; e.g., sheet metal flashing, clothing patterns, and on intersections; e.g., the intersection of two heating ducts.

Module Learner Expectations: *The student will:*

- produce surface developments and intersections for fabricating, constructing and/or manufacturing
- produce drawings for different applications, such as heating ducting, tent manufacturing, outerwear manufacturing, and different materials; e.g., sheet metal, plastic, canvas, wool
- identify and use codes, specifications and conventions as they apply in the drawings produced
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3160: TECHNICAL DRAWING STUDIO 3

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: None

Module Description: Students diagram and illustrate the design specifications for a product, structure and/or process as a basis for fabrication, manufacturing and/or construction. They complete a set of working drawings for a self-generated or teacher-specified designed item.

Module Learner Expectations: *The student will:*

- produce a complete set of working drawings for a student-generated or teacher-specified designed item
- identify and use codes, specifications and conventions as they apply in the drawings produced
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3170: VISUALIZING THE FUTURE

Level: Advanced

Theme: Business/Issues/History

Prerequisite: None

Module Description: Students explore new possibilities in design, including the role of the designer and the challenges that are faced by the designers.

Module Learner Expectations: *The student will:*

- identify a potential design challenge; e.g., a habitat for a space colony, and design a solution for it
- provide research supporting the design solution
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3180: THE DESIGN PROFESSION

Level: Advanced

Theme: Business/Issues/History

Prerequisite: None

Module Description: Students develop an understanding of the business aspect of the design profession, including educational qualifications, opportunities in design and some of the issues and challenges designers face. Ethical, legal and social issues may also be explored.

Module Learner Expectations: *The student will:*

- conduct research in one area of the business/profession of design
- identify and consider various issues faced by designers
- select, organize and present design projects
- demonstrate basic competencies.

MODULE DES3190: PORTFOLIO PRESENTATION

Level: Advanced

Theme: Business/Issues/History

Prerequisite: None

Module Description: Students prepare a presentation portfolio for a specific purpose, such as entry into the workplace or a post-secondary institution.

Module Learner Expectations: *The student will:*

- prepare a presentation portfolio for the purpose of gaining entry into the workplace and/or a post-secondary educational institution
- present the portfolio in an interview setting
- demonstrate basic competencies.