COURSE DES1010: SKETCH, DRAW & MODEL

Level: Introductory

Prerequisite: None

Description: Students are introduced to observational sketching, drawing and modelling, and to a selection of basic materials and tools and their uses. Students also develop skills that can be applied to the field of design.

Parameters: Access to basic sketching, drawing and modelling tools.

Outcomes: The student will:

1. **sketch, draw and model natural and manufactured three-dimensional (3-D) forms**
   - 1.1 draw real objects; e.g., human forms, natural and manufactured objects, artifacts from different materials with differing textures and reflective properties
   - 1.2 demonstrate various sketching and drawing styles used in different contexts; e.g., gesture, contour, tonal, isometric, perspective
   - 1.3 demonstrate observational modelling to capture the essence of forms through easily manipulated materials; e.g., clay, paper, cardboard
   - 1.4 demonstrate use of shape and form; e.g., flat shapes on surfaces, 3-D forms joined together to make new forms, 3-D forms in proximity to each other
2. **use manual sketching, drawing and modelling materials and tools effectively**
   - 2.1 recognize appropriate sketching, drawing and modelling tools
   - 2.2 demonstrate correct use and implementation of appropriate sketching, drawing and modelling tools and mediums; e.g., T-square, scales, set squares, pencil, chalk, coloured marker, ink, paint, paper, plastic, wood, foam
   - 2.3 use and maintain tools and materials in a safe and appropriate manner
   - 2.4 use appropriate scale
3. **present a portfolio-ready drawing, rendering or model that the student produced**
   - 3.1 present sketches, drawings and/or models for assessment
   - 3.2 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing observational drawing and modelling activities
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable

6.2.4 learn continuously
6.2.5 work safely

6.3 demonstrate teamwork skills to:
6.3.1 work with others
6.3.2 participate in projects and tasks

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

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

7.2 create a connection between personal inventory and occupational choices

COURSE DES1020: THE DESIGN PROCESS

Level: Introductory

Prerequisite: None

Description: Students develop an understanding of design problems through research and select, generate and evaluate possible solutions.

Parameters: Access to basic sketching, drawing and modelling tools and a computer.

Outcomes: The student will:

1. **identify the steps in the design process**
   - 1.1 recognize and apply the components of the design process, including:
     - 1.1.1 identifying the problem or need (design brief)
     - 1.1.2 researching the problem
     - 1.1.3 generating ideas and visualizing potential solutions
     - 1.1.4 choosing the best solution
     - 1.1.5 choosing the best method of presentation
     - 1.1.6 making or modelling a solution
     - 1.1.7 presenting the solution
     - 1.1.8 evaluating the solution
   - 1.2 identify the elements; e.g., line, shape (2-D) or form (3-D), colour, texture, depth (perspective), light, direction (motion), mass (visual weight), tone (black and white) or value (colour), space (positive and negative)
   - 1.3 identify the principles of design, e.g., balance, emphasis, proportion (scale), repetition (rhythm/pattern), unity, contrast, harmony, proximity and variety, as they apply to form and function
2. **apply the steps in the design process through production of a designed solution**
   - 2.1 follow the design process to create solutions for one or more 2-D or 3-D projects
   - 2.2 select and use appropriate tools and materials as outlined in the design brief
   - 2.3 effectively communicate intentions and decision making related to the design project; e.g., form, function, aesthetics
   - 2.4 use and maintain tools and materials in a safe and appropriate manner
3. **present a portfolio-ready drawing, rendering or model that the student produced**
   - 3.1 present sketches, drawings and/or models for assessment
   - 3.2 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing observational drawing and modelling activities
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information

6.1.3 use numbers
6.1.4 think and solve problems

6.2 demonstrate personal management skills to:
6.2.1 demonstrate positive attitudes and behaviours
6.2.2 be responsible
6.2.3 be adaptable
6.2.4 learn continuously
6.2.5 work safely

6.3 demonstrate teamwork skills to:
6.3.1 work with others
6.3.2 participate in projects and tasks

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

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

7.2 create a connection between personal inventory and occupational choices

COURSE DES1030: 2-D DESIGN 1

Level: Introductory

Prerequisite: DES1020: The Design Process

Description: Students develop skills and techniques for 2-D design by using tools, materials and processes common to 2-D design to complete a variety of project activities.

Parameters: Access to basic sketching, drawing and layout tools and a computer.

Supporting Courses: COM1005: Visual Composition
DES1010: Sketch, Draw & Model

Outcomes: The student will:

1. **identify and practise 2-D design techniques within the parameters of a design brief to appropriate scale; e.g., layout, grids, typography, assembly drawing**
2. **identify and use tools and materials common to 2-D design; e.g., card stock, paints, markers, cutting tools, CAD and graphic software**
   - 2.1 demonstrate basic skills using tools and materials
   - 2.2 select and use appropriate tools and materials as outlined in the design brief
   - 2.3 use and maintain tools and materials in a safe and appropriate manner
3. **identify, select and use elements and principles of design in project activities**
   - 3.1 identify the elements and principles of design and use them in the context of the techniques included in the design brief
   - 3.2 organize and apply the visual elements using selected strategies (e.g., rule of thirds, “S” curve, positive/negative space) in completing technical exercises and projects
4. **use 2-D design techniques to solve simple design problems**
   - 4.1 demonstrate techniques common to 2-D design by:
     - 4.1.1 brainstorming ideas
     - 4.1.2 preparing layouts
     - 4.1.3 using typography; e.g., title block
     - 4.1.4 preparing portfolio-ready artwork
   - 4.2 select and solve one or more 2-D design problems using the design process
5. **produce and present a portfolio-ready drawing, image or rendering**
   - 5.1 present sketches or drawings for assessment
   - 5.2 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing observational drawing activities
   - 5.3 explain intentions and decision making related to the application of elements and principles of design
6. **identify copyright restrictions and permissions and put them into practice**
7. **apply consistent and appropriate work station routines**
   - 7.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 7.2 demonstrate security for hardware, software, supplies and personal work

8. demonstrate basic competencies

8.1 demonstrate fundamental skills to:
- 8.1.1 communicate
- 8.1.2 manage information
- 8.1.3 use numbers
- 8.1.4 think and solve problems

8.2 demonstrate personal management skills to:
- 8.2.1 demonstrate positive attitudes and behaviours
- 8.2.2 be responsible
- 8.2.3 be adaptable
- 8.2.4 learn continuously
- 8.2.5 work safely

8.3 demonstrate teamwork skills to:
- 8.3.1 work with others
- 8.3.2 participate in projects and tasks

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

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

9.2 create a connection between personal inventory and occupational choices

COURSE DES1040: 3-D DESIGN 1

Level: Introductory

Prerequisite: DES1020: The Design Process

Description: Students develop skills and techniques for 3-D design by using tools, materials and processes common to 3-D design to complete a variety of project activities.

Parameters: Access to basic sketching, drawing and modelling tools and equipment and a computer.

Supporting Courses: COM1005: Visual Composition
DES1010: Sketch, Draw & Model

Outcomes: The student will:

1. **identify and practise 3-D design techniques within the parameters of a design brief to appropriate scale; e.g., process, production and presentation**
   - 1.1 use terminology associated with the techniques learned
   - 1.2 demonstrate various techniques to provide design solutions; e.g., packaging, garment, architectural model
2. **identify and use tools and materials common to 3-D design; e.g., modelling software, foam core board, fabric, wood**
   - 2.1 demonstrate basic skills using tools and materials
   - 2.2 select and use appropriate tools and materials as outlined in the design brief
   - 2.3 use and maintain tools and materials in a safe and appropriate manner
3. **identify, select and use elements and principles of design in project activities**
   - 3.1 identify the elements and principles of design and use them in the context of the techniques included in the design brief
   - 3.2 organize and apply the visual elements using selected strategies (e.g., consideration of aesthetics, trends and materials) in completing technical exercises and projects
4. **use 3-D design techniques to solve simple design problems**
   - 4.1 demonstrate techniques common to 3-D design by:
     - 4.1.1 brainstorming ideas
     - 4.1.2 manipulating forms and space
     - 4.1.3 practising basic modelling techniques
     - 4.1.4 relating materials and techniques
   - 4.2 prepare portfolio-ready product
   - 4.3 select and solve one or more 3-D design problems using the design process
5. **produce and present a portfolio-ready drawing, image, model, rendering or animation**
   - 5.1 present images or model for assessment
   - 5.2 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing observational drawing activities
   - 5.3 explain intentions and decision making related to the application of elements and principles of design
6. **identify copyright restrictions and permissions and put them into practice**

7. apply consistent and appropriate work station routines

7.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture

7.2 demonstrate security for hardware, software, supplies and personal work

8. demonstrate basic competencies

8.1 demonstrate fundamental skills to:

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

8.2 demonstrate personal management skills to:

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

8.3 demonstrate teamwork skills to:

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

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

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

9.2 create a connection between personal inventory and occupational choices

COURSE DES1050: CAD 1

Level: Introductory

Prerequisite: None

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

Parameters: Access to a computer with CAD software, a printer and/or plotter.

Supporting Course: DES1060: Technical Design & Drafting 1

Outcomes: The student will:

1. **demonstrate basic knowledge and skills required to operate CAD software**
   - 1.1 explain the purpose and advantages of CAD software; e.g., design, revision, duplication
   - 1.2 identify and demonstrate appropriate use of software and hardware
   - 1.3 effectively manage files and folders according to industry standards
2. **use CAD tools to create 2-D drawings while demonstrating basic skills**
   - 2.1 drawing space setup; e.g., toolbar, preferences, units, scale, layers
   - 2.2 drawing, modify and assist tools; e.g., line types, trim, rotate, offset, inserting blocks
   - 2.3 dimensioning and notation; e.g., linear and aligned, radius, diameter, circumference, text
   - 2.4 output; e.g., print, plot, layout space, images
3. **produce and present one or more portfolio-ready drawings**
   - 3.1 present drawing(s) for assessment
   - 3.2 maintain a design folder that illustrates skill building
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable
     - 6.2.4 learn continuously
     - 6.2.5 work safely
   - 6.3 demonstrate teamwork skills to:
     - 6.3.1 work with others
     - 6.3.2 participate in projects and tasks
7. **make personal connections to the cluster content and processes to inform possible pathway choices**
   - 7.1 complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences
   - 7.2 create a connection between personal inventory and occupational choices

COURSE DES1060: TECHNICAL DESIGN & DRAFTING 1

Level: Introductory

Prerequisite: None

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

Parameters: Access to drawing tools, software, equipment and materials.

Supporting Courses: DES1010: Sketch, Draw & Model
DES1050: CAD 1

Outcomes: The student will:

1. **recognize multi-view drawings and pictorials**
   - 1.1 identify multi-view and orthographic drawings and their common views (e.g., front, top, side) and discriminate between first angle projections and third angle projections
   - 1.2 identify common pictorial drawing types; e.g., isometric, oblique, one- and two-point perspective
2. **produce pictorial representations, surface developments and renderings**
   - 2.1 produce a minimum of one of each of the following within the context of assigned projects:
     - 2.1.1 isometric drawing
     - 2.1.2 oblique drawing (either cavalier or cabinet)
     - 2.1.3 one-point and two-point perspective drawings
     - 2.1.4 surface development for illustrating assembly; e.g., for a package, heating/ventilation duct, garment, exterior isometric
   - 2.2 draw a manufactured object that includes an illustrated detail; e.g., a hinge system on a box lid, a construction detail for a foundation, a pin to hold a wheel on an axle
3. **produce multi-view drawings**
   - 3.1 produce a minimum of one of each of the following within the context of assigned projects:
     - 3.1.1 orthographic
     - 3.1.2 plan view
     - 3.1.3 elevations; e.g., schematic, drawing
   - 3.2 apply industry standards to annotations and dimensions
4. **produce and present a portfolio-ready drawing, rendering or image**
   - 4.1 apply industry standards to presentation copy
   - 4.2 submit presentation copy for assessment
   - 4.3 maintain a design folder that illustrates skill building
5. **identify copyright restrictions and permissions and put them into practice**
6. **apply consistent and appropriate work station routines**
   - 6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 6.2 demonstrate security for hardware, software, supplies and personal work
7. **demonstrate basic competencies**
   - 7.1 demonstrate fundamental skills to:
     - 7.1.1 communicate
     - 7.1.2 manage information

7.1.3 use numbers
7.1.4 think and solve problems

7.2 demonstrate personal management skills to:
7.2.1 demonstrate positive attitudes and behaviours
7.2.2 be responsible
7.2.3 be adaptable
7.2.4 learn continuously
7.2.5 work safely

7.3 demonstrate teamwork skills to:
7.3.1 work with others
7.3.2 participate in projects and tasks

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

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

8.2 create a connection between personal inventory and occupational choices

COURSE DES1910: DES PROJECT A

Level: Introductory

Prerequisite: None

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

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

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

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

Outcomes:

The teacher/student will:

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

The student will:

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

3.4 evaluate the project and/or performance, indicating the:
    3.4.1 processes and strategies used
    3.4.2 recommendations on how the project and/or performance could have been improved

4. identify copyright restrictions and permissions and put them into practice

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:
    5.1.1 communicate
    5.1.2 manage information
    5.1.3 use numbers
    5.1.4 think and solve problems

5.2 demonstrate personal management skills to:
    5.2.1 demonstrate positive attitudes and behaviours
    5.2.2 be responsible
    5.2.3 be adaptable
    5.2.4 learn continuously
    5.2.5 work safely

5.3 demonstrate teamwork skills to:
    5.3.1 work with others
    5.3.2 participate in projects and tasks

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

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

6.2 create a connection between a personal inventory and occupational choices

COURSE DES2035: 2-D DESIGN 2

Level: Intermediate

Prerequisite: DES1030: 2-D Design 1

Description: Students continue to develop skills and techniques for 2-D design by using tools, materials and processes common to 2-D design to complete a variety of project activities.

Parameters: Access to drawing tools, equipment and materials.

Outcomes: The student will:

1. **plan and produce solutions to 2-D design briefs**
   - 1.1 apply the design process to solve a 2-D design problem; e.g., floor plan, wrought iron gate, stained glass window, clothing pattern
   - 1.2 select and use appropriate tools and materials as outlined in the design brief
   - 1.3 use and maintain tools and materials in a safe and appropriate manner
2. **incorporate the elements and principles of design to achieve the design solution**
   - 2.1 apply techniques, tools, materials and other resources in design solution; e.g., tone, texture and colour, markers and paints, images, typeface, drawing, layout, measuring, notation, rendering, assembly drawing and correct use of tools
   - 2.2 use mathematical and/or scientific principles as they apply to design projects assigned; e.g., organization of visual space, measurement of internal space, borders, columns, use of scale
   - 2.3 experiment with one or more elements (e.g., colour, line, shape) and/or principles (e.g., rhythm, balance) to achieve desired effects
3. **produce and present a portfolio-ready drawing, image or rendering**
   - 3.1 participate in interim critiques; e.g., self, peer, instructor
   - 3.2 discuss intentions and decision making related to the application of the elements and principles of design
   - 3.3 present sketches or drawings for assessment
   - 3.4 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing observational drawing activities
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable

6.2.4 learn continuously
6.2.5 work safely

6.3 demonstrate teamwork skills to:
6.3.1 work with others
6.3.2 participate in projects and tasks

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

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

COURSE DES2045: 3-D DESIGN 2

Level: Intermediate

Prerequisite: DES1040: 3-D Design 1

Description: Students continue to develop skills and techniques for 3-D design by using tools, materials and processes common to 3-D design to complete a variety of project activities.

Parameters: Basic sketching, drawing, layout tools and/or a computer with 3-D design software.

Outcomes: The student will:

1. **plan and produce solutions to 3-D design briefs**
   - 1.1 select and use appropriate tools and materials as outlined in the design brief
   - 1.2 apply the design process to solve a 3-D design problem; e.g., software modelling, cutting, joining, bending, measuring
   - 1.3 use and maintain tools and materials in a safe and appropriate manner
2. **incorporate the elements and principles of design to achieve the design solution**
   - 2.1 apply techniques, tools, materials and other resources in design solution; e.g., tone, texture and colour, markers and paints, images, typeface, drawing, layout, measuring, notation, rendering, assembly drawing and correct use of tools
   - 2.2 use mathematical and/or scientific principles as they apply to design projects assigned; e.g., organization of visual space, measurement of internal space, borders, columns, use of scale
   - 2.3 experiment with one or more elements (e.g., colour, line, shape) and/or principles (e.g., rhythm, balance) to achieve desired effects
3. **produce and present a portfolio-ready drawing, image or rendering**
   - 3.1 participate in interim critiques; e.g., self, peer, instructor
   - 3.2 discuss intentions and decision making related to the application of elements and principles of design
   - 3.3 present images and/or model(s) for assessment
   - 3.4 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing observational drawing activities that illustrates skill building
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible

6.2.3 be adaptable
6.2.4 learn continuously
6.2.5 work safely

6.3 demonstrate teamwork skills to:
6.3.1 work with others
6.3.2 participate in projects and tasks

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

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

7.2 identify potential resources to minimize barriers and maximize opportunities

COURSE DES2055: CAD 2

Level: Intermediate

Prerequisite: DES1050: CAD 1

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

Parameters: Access to a computer with CAD software, a printer and/or plotter.

Outcomes: The student will:

1. **demonstrate intermediate knowledge and skills required to operate CAD software**
   - 1.1 acknowledge the advantages and disadvantages of various types of CAD software available
   - 1.2 identify and demonstrate appropriate use of software and hardware
   - 1.3 effectively manage file types and folders according to industry standards
2. **use CAD tools to create 2-D and 3-D drawings to demonstrate the following intermediate skills**
   - 2.1 identify and demonstrate appropriate tools, methods and functions; e.g., insert and explode, wire frame, solid drawings, polylines, coordinates and vectors, isometric grid/snap tools
   - 2.2 select and use CAD tools, methods and functions to produce layered multiview drawings and pictorial drawings and/or surface developments based on pictorial sketches or real three-dimensional objects
   - 2.3 print/plot or display drawings/renderings or animation
3. **produce and present a portfolio-ready drawing, image or rendering**
   - 3.1 participate in interim critiques; e.g., self, peer, instructor
   - 3.2 discuss intentions and decision making related to the application of elements and principles of design
   - 3.3 present images and/or model(s) for assessment
   - 3.4 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing activities that illustrates skill building
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable
     - 6.2.4 learn continuously
     - 6.2.5 work safely

6.3 demonstrate teamwork skills to:
    6.3.1 work with others
    6.3.2 participate in projects and tasks

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

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

COURSE DES2060: EVOLUTION OF DESIGN

Level: Intermediate

Prerequisite: None

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

Parameters: Access to resources; e.g., library, Internet.

Outcomes: The student will:

1. **demonstrate knowledge of historical and contemporary design resources**
   - 1.1 describe historical influences in design
   - 1.2 identify and explain the relationship between a design solution in the past and a current design solution (e.g., buildings, graphics, fashion and transportation) including the influence of cultural, global, ethical and environmental conditions on the solution
   - 1.3 maintain a design journal/sketchbook of the project
2. **present research findings**
   - 2.1 prepare a presentation of research findings; e.g., a research paper, a media presentation, graphic illustrations
   - 2.2 use tools, materials and other resources appropriate for the presentation; e.g., computer, software, display materials
   - 2.3 prepare for and actively participate in a final presentation and critique describing the area of study and findings
3. **include the presentation in a portfolio**
   - 3.1 participate in a final critique
   - 3.2 use appropriate terminology within the design context
4. **identify copyright restrictions and permissions and put them into practice**
5. **demonstrate basic competencies**
   - 5.1 demonstrate fundamental skills to:
     - 5.1.1 communicate
     - 5.1.2 manage information
     - 5.1.3 use numbers
     - 5.1.4 think and solve problems
   - 5.2 demonstrate personal management skills to:
     - 5.2.1 demonstrate positive attitudes and behaviours
     - 5.2.2 be responsible
     - 5.2.3 be adaptable
     - 5.2.4 learn continuously
     - 5.2.5 work safely
   - 5.3 demonstrate teamwork skills to:
     - 5.3.1 work with others
     - 5.3.2 participate in projects and tasks
6. **identify possible life roles related to the skills and content of this cluster**
   - 6.1 recognize and then analyze the opportunities and barriers in the immediate environment
   - 6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE DES2065: TECHNICAL DESIGN 2

Level: Intermediate

Prerequisite: DES1060: Technical Design & Drafting 1

Description: Students refine skills and techniques to present appropriate drawings and/or model(s) for visualizing and illustrating solutions to design problems.

Parameters: Access to drawing tools, equipment and materials.

Supporting Course: DES2055: CAD 2

Outcomes: The student will:

1. **demonstrate intermediate skills by producing pictorial drawings (e.g., isometric, oblique, one- and two-point perspective, technical flats) including rendering styles and techniques**
   - 1.1 select appropriate drawing types and styles and use them to accurately illustrate potential design solutions
   - 1.2 select and use appropriate tools and materials as outlined in each design brief
2. **present a pictorial representation complete with surface developments and renderings to a client**
   - 2.1 assess client needs based on design brief; e.g., time management, cost, technology available, aesthetics
   - 2.2 produce a presentation plan for approval; e.g., what style of images and modelling meets client needs set out in the design brief
   - 2.3 construct, critique and revise presentation
   - 2.4 present a solution to the client
3. **include the design solution in a portfolio**
   - 3.1 participate in interim critiques; e.g., self, peer, instructor
   - 3.2 discuss intentions and decision making related to the application of elements and principles of design
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable
     - 6.2.4 learn continuously
     - 6.2.5 work safely

6.3 demonstrate teamwork skills to:
    6.3.1 work with others
    6.3.2 participate in projects and tasks

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

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

COURSE DES2075: TECHNICAL DRAFTING 2

Level: Intermediate

Prerequisite: DES1060 Technical Design & Drafting 1

Description: Students produce technical drawings from sketches and apply industry standards, conventions and terminology associated with technical drawing creation.

Parameters: Access to drawing tools, equipment and materials.

Supporting Courses: DES2055: CAD 2
DES2065: Technical Design 2

Outcomes: The student will:

1. **produce technical drawings for simple structures, products and/or components**
   - 1.1 describe the need for specific types of drawings and where and when they are used; e.g., detail, assembly, sectional, exploded view, section and/or auxiliary drawing
   - 1.2 select appropriate drawing types and styles and use them to accurately illustrate potential design solutions
   - 1.3 select and use appropriate tools and materials as outlined in each design brief
   - 1.4 produce a minimum of four of each of the following drawings based on the sketches provided:
     - 1.4.1 multi-view drawing (showing a minimum of three views)
     - 1.4.2 detail drawing
     - 1.4.3 assembly drawing
     - 1.4.4 sectional drawing
     - 1.4.5 auxiliary drawing
     - 1.4.6 exploded view drawing
2. **dimension and annotate drawings accurately**
   - 2.1 demonstrate standard conventions of annotating technical drawings; e.g., title blocks, labelling/lettering, notes
   - 2.2 demonstrate the correct use of line types; e.g., solid, hidden, projection, break, fold, phantom
   - 2.3 demonstrate industry standards regarding dimensioning; e.g., extension lines, dimension placement, scale and measuring
3. **present the portfolio-ready drawings**
   - 3.1 use appropriate terminology within the context
   - 3.2 print/plot drawings and include them in a portfolio
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems

6.2 demonstrate personal management skills to:
- 6.2.1 demonstrate positive attitudes and behaviours
- 6.2.2 be responsible
- 6.2.3 be adaptable
- 6.2.4 learn continuously
- 6.2.5 work safely

6.3 demonstrate teamwork skills to:
- 6.3.1 work with others
- 6.3.2 participate in projects and tasks

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

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

7.2 identify potential resources to minimize barriers and maximize opportunities

COURSE DES2910: DES PROJECT B

Level: Intermediate

Prerequisite: None

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

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

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

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

Outcomes:

The teacher/student will:

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

The student will:

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

3.4 evaluate the project and/or performance, indicating the:
    3.4.1 processes and strategies used
    3.4.2 recommendations on how the project and/or performance could have been improved

4. identify copyright restrictions and permissions and put them into practice

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:
    5.1.1 communicate
    5.1.2 manage information
    5.1.3 use numbers
    5.1.4 think and solve problems

5.2 demonstrate personal management skills to:
    5.2.1 demonstrate positive attitudes and behaviours
    5.2.2 be responsible
    5.2.3 be adaptable
    5.2.4 learn continuously
    5.2.5 work safely

5.3 demonstrate teamwork skills to:
    5.3.1 work with others
    5.3.2 participate in projects and tasks

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

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

6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE DES2920: DES PROJECT C

Level: Intermediate

Prerequisite: None

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

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

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

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

Outcomes:

The teacher/student will:

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

The student will:

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

3.4 evaluate the project and/or performance, indicating the:
    3.4.1 processes and strategies used
    3.4.2 recommendations on how the project and/or performance could have been improved

4. identify copyright restrictions and permissions and put them into practice

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:
    5.1.1 communicate
    5.1.2 manage information
    5.1.3 use numbers
    5.1.4 think and solve problems

5.2 demonstrate personal management skills to:
    5.2.1 demonstrate positive attitudes and behaviours
    5.2.2 be responsible
    5.2.3 be adaptable
    5.2.4 learn continuously
    5.2.5 work safely

5.3 demonstrate teamwork skills to:
    5.3.1 work with others
    5.3.2 participate in projects and tasks

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

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

6.2 identify potential resources to minimize barriers and maximize opportunities

COURSE DES2950: DES INTERMEDIATE PRACTICUM

Level: Intermediate

Prerequisite: None

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

Parameters: This practicum course, which may be delivered on- or off-campus, should be accessed only by students continuing to work toward attaining a recognized credential/credentials or an articulation offered by an external organization. This course must be connected to at least one CTS course from the same occupational area and cannot be used in conjunction with any advanced (3XXX) level course. A practicum course cannot be delivered as a stand-alone course, cannot be combined with a CTS project course and cannot be used in conjunction with the Registered Apprenticeship Program or the Green Certificate Program.

Outcomes: The student will:

1. perform assigned tasks and responsibilities, as required by the organization granting the credential(s) or articulation

- 1.1 identify regulations and regulatory bodies related to the credential(s) or articulation
- 1.2 describe personal roles and responsibilities, including:
  - 1.2.1 key responsibilities
  - 1.2.2 support functions/responsibilities/expectations
  - 1.2.3 code of ethics and/or conduct
- 1.3 describe personal work responsibilities and categorize them as:
  - 1.3.1 routine tasks; e.g., daily, weekly, monthly, yearly
  - 1.3.2 non-routine tasks; e.g., emergencies
  - 1.3.3 tasks requiring personal judgement
  - 1.3.4 tasks requiring approval of a supervisor
- 1.4 demonstrate basic employability skills and perform assigned tasks and responsibilities related to the credential(s) or articulation

2. analyze personal performance in relation to established standards

- 2.1 evaluate application of the attitudes, skills and knowledge developed in related CTS courses
- 2.2 evaluate standards of performance in terms of:
  - 2.2.1 quality of work
  - 2.2.2 quantity of work
- 2.3 evaluate adherence to workplace legislation related to health and safety
- 2.4 evaluate the performance requirements of an individual who is trained, experienced and employed in a related occupation in terms of:
  - 2.4.1 training and certification
  - 2.4.2 interpersonal skills
  - 2.4.3 technical skills
  - 2.4.4 ethics

3. demonstrate basic competencies

3.1 demonstrate fundamental skills to:
- 3.1.1 communicate
- 3.1.2 manage information
- 3.1.3 use numbers
- 3.1.4 think and solve problems

3.2 demonstrate personal management skills to:
- 3.2.1 demonstrate positive attitudes and behaviours
- 3.2.2 be responsible
- 3.2.3 be adaptable
- 3.2.4 learn continuously
- 3.2.5 work safely

3.3 demonstrate teamwork skills to:
- 3.3.1 work with others
- 3.3.2 participate in projects and tasks

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

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

4.2 identify potential resources to minimize barriers and maximize opportunities

COURSE DES3035: 2-D DESIGN 3

Level: Advanced

Prerequisite: DES2035: 2-D Design 2

Description: Students apply theories, skills and techniques to resolve complex 2-D design problems. Emphasis is placed on exploring shape, composition, aesthetics, cultural context, materials, processes and systems, while addressing social responsibility and environmental stewardship.

Parameters: Access to drawing tools (conventional and/or software), equipment and materials.

Outcomes: The student will:

1. **produce an advanced 2-D design solution for an advanced level design brief**
   - 1.1 identify a problem considering architecture, landscape architecture, industrial design, engineering or interior design, and write a design brief
   - 1.2 identify and accommodate human factors commonly affected by design solutions
   - 1.3 describe the impact regarding shape, composition and aesthetics of the solution on the stakeholders; e.g., cultural, psychological and physiological
   - 1.4 identify and select materials based on their properties and justify their use in the context of the design solution
   - 1.5 identify and select production processes and justify their use in the context of the design solution
   - 1.6 consider environmental stewardship
2. **select the most appropriate solution based on the design brief**
   - 2.1 assess intentions and decision making related to the application of elements and principles of design
   - 2.2 participate in interim critiques; e.g., self, peer, instructor, client
3. **construct presentation for design solution**
   - 3.1 prepare a detailed plan for the construction and presentation of the design solution; e.g., write up, sequential diagram, safety concerns, cost and material sheet
   - 3.2 secure approval to begin the design solution
   - 3.3 identify and use techniques, tools, materials and other resources as outlined in the plan for presenting the design solution
4. **present and produce a portfolio-ready design solution**
   - 4.1 maintain a journal/sketchbook throughout the process that illustrates skill building
   - 4.2 present design work for assessment
   - 4.3 participate in a final critique
   - 4.4 print/plot design work and include in a portfolio
5. **identify copyright restrictions and permissions and put them into practice**
6. **apply consistent and appropriate work station routines**
   - 6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 6.2 demonstrate security for hardware, software, supplies and personal work

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:

- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:

- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:

- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals

8.2 identify steps to achieve goals

COURSE DES3045: 3-D DESIGN 3

Level: Advanced

Prerequisite: DES2045: 3-D Design 2

Description: Students apply theories, skills and techniques appropriate to 3-D design. Students will deal with such aspects as shaping, massing, proportion, scale, contrast, colour, texture and finish within the context of complex 3-D design projects. Students are introduced to cultural, symbolic and human factors, principles and ergonomic considerations.

Parameters: Basic sketching, drawing, layout and modelling tools and/or a computer with 3-D design software.

Outcomes: The student will:

1. **analyze 3-D design projects/products; e.g., displays, exhibits, dramatic sets, products, packaging, furniture, lighting, interface, new technology**
   - 1.1 discuss the strengths and weakness of the projects/products
   - 1.2 evaluate based on set criteria; e.g., usefulness, aesthetic, function, form, material use
   - 1.3 consider symbolic and cultural connotations to make aesthetic judgments about projects/products
2. **plan advanced level designed solutions for 3-D design problem**
   - 2.1 identify a problem considering architecture, landscape architecture, industrial design, engineering or interior design, and write a design brief
   - 2.2 identify and accommodate human factors commonly affected by design solutions
   - 2.3 describe the impact regarding shape, composition and aesthetics of the solution on the stakeholders; e.g., cultural, psychological and physiological
   - 2.4 consider environmental stewardship
3. **construct 3-D design for design solution**
   - 3.1 prepare a detailed plan for the construction and presentation of the design solution/prototype; e.g., write up, sequential diagram, safety concerns, cost and material sheet
   - 3.2 secure approval to begin the design solution
   - 3.3 identify and use techniques, tools, materials and other resources as outlined in the plan for presenting the design solution
   - 3.4 demonstrate appropriate use of elements, principles and considerations common to 3-D design
4. **present a portfolio-ready 3-D design solution; e.g., model, image or rendering**
   - 4.1 participate in interim critiques; e.g., self, peer, instructor
   - 4.2 assess intentions and decision making related to the application of elements and principles of design
   - 4.3 present a solution for assessment; e.g., images, model and/or prototype
   - 4.4 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing observational drawing activities that illustrates skill building
   - 4.5 evaluate the design solution based on set criteria; e.g., usefulness, aesthetic, function, form, material use
   - 4.6 explain symbolic and cultural connotations of the generated 3-D design solution
5. **identify copyright restrictions and permissions and put them into practice**

6. apply consistent and appropriate work station routines

6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture

6.2 demonstrate security for hardware, software, supplies and personal work

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:

- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:

- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:

- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals

8.2 identify steps to achieve goals

COURSE DES3055: CAD 3

Level: Advanced

Prerequisite: DES2055: CAD 2

Description: Students solve design problem(s) using advanced computer-aided design (CAD) methods, advanced commands, 2-D and/or 3-D modelling techniques, rendering, shading, and animation techniques.

Parameters: Access to a computer with CAD software, a printer and/or plotter.

Outcomes: The student will:

1. **use advanced features of CAD program to design and model a working prototype of a solution to an advanced level design problem**
   - 1.1 identify an advanced CAD problem
   - 1.2 develop a solution that uses advanced software features, such as student-developed materials, lighting, walk through, Booleans, biological form, multi-part, mechanical, intricate detail, animated assemblies
   - 1.3 create a model, image and/or working drawings on a computer in response to the outlined problem
2. **demonstrate the ability to locate and use advanced tools, resources and processes of the program when working with design or model; e.g., tutorials, help, manuals**
3. **produce and present a portfolio-ready CAD drawing, image or rendering**
   - 3.1 participate in interim critiques; e.g., self, peer, instructor
   - 3.2 assess intentions and decision making related to the application of elements and principles of design
   - 3.3 present images for assessment
   - 3.4 maintain a design folder, journal or sketchbook as part of the portfolio of ongoing activities that illustrates skill building
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable
     - 6.2.4 learn continuously
     - 6.2.5 work safely

6.3 demonstrate teamwork skills to:
    6.3.1 work with others
    6.3.2 participate in projects and tasks

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

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

COURSE DES3065: TECHNICAL DESIGN 3

Level: Advanced

Prerequisite: DES2065: Technical Design 2

Description: Students concentrate on various drawing and drafting types to illustrate design concepts and solutions, including freehand drawings, illustrative views, perspective drawings, axonometric drawings and surface developments (flat pattern).

Parameters: Access to drawing tools, equipment and materials.

Outcomes: The student will:

1. **produce illustrative drawings for a student-generated or teacher-specified designed item**
   - 1.1 produce illustrative drawings for the production of a designed item; e.g., a building interior/exterior, landscape, fashion, machined item, pre-fabricated component
   - 1.2 select and use appropriate tools and materials
   - 1.3 select, propose and justify the drawings needed to produce the designed item and approve before starting; e.g., freehand drawings, illustrative views, perspective drawings, axonometric drawings, surface developments (flat pattern)
   - 1.4 produce illustrative drawings using appropriate drawing techniques; e.g., accuracy in proportion and scale, using freehand perspective grids, underlay isometric grids
   - 1.5 demonstrate competency in conventional and/or software techniques for construction of accurate, illustrative views of design solutions
   - 1.6 select and use appropriate drawing instruments, materials and computer applications
2. **apply design detailing, and make rational judgments with respect to proportion, scale and composition**
   - 2.1 resolve problems of design detailing during drawing projects, with attention to such aspects as proportion, scale and composition
   - 2.2 complete as line drawings only; i.e., no surface textures or shading
3. **include the design solution in a portfolio**
   - 3.1 maintain a journal/sketchbook throughout the process
   - 3.2 participate in a final critique
   - 3.3 use appropriate terminology within the context
   - 3.4 print/plot drawings and include them in a portfolio
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems

6.2 demonstrate personal management skills to:
- 6.2.1 demonstrate positive attitudes and behaviours
- 6.2.2 be responsible
- 6.2.3 be adaptable
- 6.2.4 learn continuously
- 6.2.5 work safely

6.3 demonstrate teamwork skills to:
- 6.3.1 work with others
- 6.3.2 participate in projects and tasks

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

7.1 identify short-term and long-term goals

7.2 identify steps to achieve goals

COURSE DES3075: TECHNICAL DRAFTING 3

Level: Advanced

Prerequisite: DES2075: Technical Drafting 2

Description: Students use drawing conventions and procedures to draw with and manipulate manual drafting equipment and/or CAD. Students draw orthographic, sectioned view, auxiliary view and axonometric drawings. Students demonstrate the ability to draw complete drawings using accepted line-work, lettering, layout and dimensioning techniques, while adhering to a drafting standard.

Parameters: Access to drawing tools (conventional and/or software), equipment and materials.

Outcomes: The student will:

1. **produce working drawings for a student-generated or teacher-specified designed item**
   - 1.1 produce working drawings for the production of a designed item (e.g., a building, system, fashion, machined item, pre-fabricated component), ensuring that:
     - 1.1.1 all dimensioning details required for production are included
     - 1.1.2 appropriate codes are met in the specifications indicated
   - 1.2 select and use appropriate tools and materials
   - 1.3 select, propose and justify the drawings needed to produce the designed item for approval before completion; e.g., multi-view drawing (showing a minimum of three views), detail drawing, assembly drawing, sectional drawing, auxiliary drawing, exploded view, stretchout, revolved sections, offset sections
   - 1.4 dimension and annotate drawings accurately
2. **present portfolio-ready drawings**
3. **include the design solution in a portfolio**
   - 3.1 maintain a journal/sketchbook throughout the process
   - 3.2 participate in a final critique
   - 3.3 use appropriate terminology within the context
   - 3.4 print/plot drawings and include them in a portfolio
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable
     - 6.2.4 learn continuously
     - 6.2.5 work safely

6.3 demonstrate teamwork skills to:
    6.3.1 work with others
    6.3.2 participate in projects and tasks

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

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

COURSE DES3095: ARCHITECTURAL DESIGN

Level: Advanced

Prerequisites: DES2055: CAD 2 ***or***
DES2075: Technical Drafting 2

Description: Students translate architectural design concepts into graphic images, and then convert those images into technical drawings and specifications that result in the creation of the built environment.

Parameters: Access to drawing tools (conventional and/or software), equipment and materials.

Supporting Courses: DES3055: CAD 3
DES3075: Technical Drafting 3
ENS2210: Sustainable Building Design & Construction

Outcomes: The student will:

1. **identify a client need and create an architectural design brief**
   - 1.1 investigate architectural design meeting human, environmental and cultural needs
   - 1.2 consider residential or commercial requirements, including:
     - 1.2.1 materials
     - 1.2.2 appropriate codes; e.g., building code, zoning, fire, accessibility
     - 1.2.3 styles
     - 1.2.4 environment
     - 1.2.5 client needs
2. **produce an architectural design that addresses human and/or environmental needs**
   - 2.1 structure a plan for resolution; e.g., concept drawings, thumbnail sketch
   - 2.2 produce architectural drawings, including:
     - 2.2.1 detailed floor plan
     - 2.2.2 elevations
     - 2.2.3 building section
   - 2.3 demonstrate organization and management of personal learning with minimal external direction, in both individual and cooperative learning situations
   - 2.4 consider environmental stewardship in proposed design
3. **present and describe the solution based on the needs outlined in the design brief**
4. **include the design solution in a portfolio**
   - 4.1 participate in a final critique
   - 4.2 use appropriate terminology within the context
   - 4.3 include examples of the plan for resolution in a portfolio
5. **identify copyright restrictions and permissions and put them into practice**
6. **apply consistent and appropriate work station routines**
   - 6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 6.2 demonstrate security for hardware, software, supplies and personal work

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:

- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:

- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:

- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals

8.2 identify steps to achieve goals

COURSE DES3105: ENGINEERING DESIGN

Level: Advanced

Prerequisites: DES2055: CAD 2 ***or***
DES2075: Technical Drafting 2

Description: Students develop complex explanatory drawings for civil, mechanical, structural or electrical systems. This is a skill-building course with an emphasis on explanatory line drawings suitable for presentation and assembly.

Parameters: Access to drawing tools (conventional and/or software), equipment and materials.

Supporting Courses: DES3055: CAD 3
DES3075: Technical Drafting 3
ENS2210: Sustainable Building Design & Construction

Outcomes: The student will:

1. **identify a client need and create an engineering design brief**
   - 1.1 investigate engineering design meeting human, environmental and cultural needs
   - 1.2 consider personal and industrial requirements, including:
     - 1.2.1 appropriate codes; e.g., Canadian Standards Association (CSA), Underwriters Laboratory (UL), building code
     - 1.2.2 materials
     - 1.2.3 schematics
     - 1.2.4 schedules
     - 1.2.5 environment
     - 1.2.6 client needs
2. **produce a design solution that addresses human and/or environmental needs**
   - 2.1 structure a plan for resolution; e.g., concept drawings, thumbnail sketch
   - 2.2 produce engineering drawings according to the needs set in the design brief, including:
     - 2.2.1 assembly
     - 2.2.2 exploded views
     - 2.2.3 cut-away
     - 2.2.4 detail
     - 2.2.5 revolutions
     - 2.2.6 section
     - 2.2.7 stretchout
   - 2.3 demonstrate organization and management of personal learning with minimal external direction, in both individual and cooperative learning situations
   - 2.4 consider environmental stewardship in proposed design
3. **present and describe the solution based on the needs outlined in the design brief**
4. **include the design solution in a portfolio**
   - 4.1 participate in a final critique
   - 4.2 use appropriate terminology within the context
   - 4.3 include examples of the plan for resolution in a portfolio
5. **identify copyright restrictions and permissions and put them into practice**

6. apply consistent and appropriate work station routines

6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture

6.2 demonstrate security for hardware, software, supplies and personal work

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:

- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:

- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:

- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals

8.2 identify steps to achieve goals

COURSE DES3115: INDUSTRIAL DESIGN

Level: Advanced

Prerequisites: DES2055: CAD 2 ***or***
DES2075: Technical Drafting 2

Description: Industrial design incorporates innovation, aesthetics, functional requirements, technology and ergonomics into a product in order to better meet the needs of the user. Students work creatively with design problems to analyze, propose and produce solutions using contemporary materials, techniques and finishes. The resulting presentations are both professional and unique.

Parameters: Access to drawing tools (conventional and/or software), equipment and materials.

Supporting Courses: DES3055: CAD 3
DES3075: Technical Drafting 3
ENS2210: Sustainable Building Design & Construction

Outcomes: The student will:

1. **identify a client need and create a brief for a designed product**
   - 1.1 investigate industrial design meeting human, environmental and cultural needs
   - 1.2 consider personal or industrial requirements, including:
     - 1.2.1 materials
     - 1.2.2 ergonomics
     - 1.2.3 environmental impact; e.g., sustainability, packaging, resources
     - 1.2.4 function
     - 1.2.5 aesthetic
     - 1.2.6 client needs
2. **produce a design solution that addresses human and/or environmental needs**
   - 2.1 structure a plan for resolution; e.g., concept drawings, thumbnail sketches
   - 2.2 produce technical drawings according to the needs set in the design brief, including:
     - 2.2.1 assembly drawings
     - 2.2.2 orthographic
     - 2.2.3 detail drawing
     - 2.2.4 rendered perspective
     - 2.2.5 section
     - 2.2.6 axonometric
   - 2.3 demonstrate organization and management of personal learning with minimal external direction, in both individual and cooperative learning situations
   - 2.4 consider environmental stewardship in proposed design
3. **present and describe the solution based on the needs outlined in the design brief**
4. **include the design solution in a portfolio**
   - 4.1 participate in a final critique
   - 4.2 use appropriate terminology within the context
   - 4.3 include examples of the plan for resolution in a portfolio
5. **identify copyright restrictions and permissions and put them into practice**

6. apply consistent and appropriate work station routines

6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture

6.2 demonstrate security for hardware, software, supplies and personal work

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:

- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:

- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:

- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals

8.2 identify steps to achieve goals

COURSE DES3125: INTERIOR DESIGN

Level: Advanced

Prerequisites: DES2055: CAD 2 ***or***
DES2075: Technical Drafting 2

Description: Students learn to consider form and space when developing interior design solutions specific to human and/or environmental needs. Students assess solutions on the basis of functional and aesthetic considerations and appropriateness within the human environment. The design process is applied to solve abstract and realistic interior design problems.

Parameters: Access to drawing tools (conventional and/or software), equipment and materials.

Supporting Courses: DES3055: CAD 3
DES3075: Technical Drafting 3
ENS2210: Sustainable Building Design & Construction

Outcomes: The student will:

1. identify a client need and create an interior design brief
- 1.1 investigate interior design that meets human, environmental and cultural needs
- 1.2 consider residential or commercial requirements, including:
  - 1.2.1 current materials
  - 1.2.2 appropriate codes; e.g., building code, zoning, fire
  - 1.2.3 styles
  - 1.2.4 colour theory
  - 1.2.5 lighting; e.g., mood, principles of illumination, lighting sources
  - 1.2.6 traffic flow
  - 1.2.7 environment
  - 1.2.8 client needs

2. produce an interior design that addresses human and/or environmental needs
- 2.1 structure a plan for resolution; e.g., concept drawings, thumbnail sketch
- 2.2 produce appropriate interior drawings according to the needs set in the design brief, including:
  - 2.2.1 floor plan, complete with furnishings
  - 2.2.2 rendered elevations
  - 2.2.3 rendered perspectives
  - 2.2.4 lighting plan
- 2.3 produce a materials sample board; e.g., colour swatches, textures, material swatches
- 2.4 demonstrate organization and management of personal learning with minimal external direction, in both individual and cooperative learning situations
- 2.5 consider environmental stewardship in proposed design

3. present and describe the solution based on the needs outlined in the design brief

4. include the design solution in a portfolio
- 4.1 participate in a final critique
- 4.2 use appropriate terminology within the context
- 4.3 include examples of the plan for resolution in a portfolio

5. identify copyright restrictions and permissions and put them into practice

6. apply consistent and appropriate work station routines

6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture

6.2 demonstrate security for hardware, software, supplies and personal work

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:

- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:

- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:

- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals

8.2 identify steps to achieve goals

COURSE DES3135: LANDSCAPE DESIGN

Level: Advanced

Prerequisites: DES2055: CAD 2 ***or***
DES2075: Technical Drafting 2

Description: Students learn to consider form and space when producing man-made environments that are ecologically appropriate, functionally successful and aesthetically pleasing. Students learn about the need to establish a balance between use and enjoyment of the land and the conservation and health of the environment. The design process is applied to solve abstract or realistic landscape design problems.

Parameters: Access to drawing tools (conventional and/or software), equipment and materials.

Supporting Courses: DES3055: CAD 3
DES3075: Technical Drafting 3
ENS2210: Sustainable Building Design & Construction

Outcomes: The student will:

1. identify a client need and create a landscape design brief
- 1.1 investigate landscape design that meets human, environmental and cultural needs
- 1.2 consider residential or commercial requirements, including:
  - 1.2.1 topography
  - 1.2.2 ecology
  - 1.2.3 geographic location
  - 1.2.4 materials/resources
  - 1.2.5 appropriate codes; e.g., building code, zoning, fire
  - 1.2.6 styles; e.g., formal, informal, natural, groomed
  - 1.2.7 environment; e.g., sustainability, xeriscape, reclamation
  - 1.2.8 client needs

2. produce a landscape design that addresses human and/or environmental needs
- 2.1 structure a plan for resolution; e.g., concept drawings, thumbnail sketch
- 2.2 produce appropriate landscape drawings according to the needs set in the design brief, including:
  - 2.2.1 site plan; e.g., survey, legal, planting
  - 2.2.2 rendered elevations
  - 2.2.3 rendered perspectives
  - 2.2.4 drainage
- 2.3 demonstrate organization and management of personal learning with minimal external direction, in both individual and cooperative learning situations
- 2.4 consider environmental stewardship in proposed design

3. present and describe the solution based on the needs outlined in the design brief

4. include the design solution in a portfolio
- 4.1 participate in a final critique
- 4.2 use appropriate terminology within the context
- 4.3 include examples of the plan for resolution in a portfolio

5. identify copyright restrictions and permissions and put them into practice

6. apply consistent and appropriate work station routines

6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture

6.2 demonstrate security for hardware, software, supplies and personal work

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:

- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:

- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:

- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals

8.2 identify steps to achieve goals

COURSE DES3145: MODELLING – REAL

Level: Advanced

Prerequisite: DES1010: Sketch, Draw & Model

Description: Students use the principles and techniques of physical modelling. They will develop the ability to construct models using a variety or materials, equipment and techniques from working drawings.

Parameters: Access to drawing and modelling tools, equipment and materials.

Outcomes: The student will:

1. **identify a client need and create a brief for a designed model**
   - 1.1 determine the type of model best suited to the design brief; e.g., detail, massing, topographic, study, presentation
   - 1.2 consider safety, equipment, materials, scale and cost
2. **produce a physical model**
   - 2.1 select, organize and use appropriate tools and materials
   - 2.2 schedule construction time line
   - 2.3 demonstrate accuracy in measurement
   - 2.4 use correct scale and layout techniques
   - 2.5 demonstrate precision in cutting and assembly
   - 2.6 use appropriate joinery and fastening techniques
3. **present the model**
4. **include the model in a portfolio**
   - 4.1 participate in a final critique
   - 4.2 include images of the model in a portfolio
5. **identify copyright restrictions and permissions and put them into practice**
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable
     - 6.2.4 learn continuously
     - 6.2.5 work safely
   - 6.3 demonstrate teamwork skills to:
     - 6.3.1 work with others
     - 6.3.2 participate in projects and tasks
7. **create a transitional strategy to accommodate personal changes and build personal values**
   - 7.1 identify short-term and long-term goals
   - 7.2 identify steps to achieve goals

COURSE DES3155: MODELLING – VIRTUAL

Level: Advanced

Prerequisite: DES2055: CAD 2

Description: Students use virtual 3D design concepts as a starting point for developing the skill and knowledge needed to design in virtual space. Students develop an understanding of light, form, texture and shape. These components are explored through digital modelling exercises.

Parameters: Access to drawing and modelling software, equipment and materials.

Outcomes: The student will:

1. **identify a client need and create a brief for a designed model**
   - 1.1 determine the type of model best suited to the design brief; e.g., detail, massing, topographic, study, presentation, fly-though, shadow study
   - 1.2 consider materials, scale and cost
2. **produce a virtual model**
   - 2.1 use correct scale, and workspace and layout techniques
   - 2.2 construct and label elements appropriately
   - 2.3 group elements correctly
   - 2.4 import/export model files using correct scale
   - 2.5 include elements of design in the model with precision and accuracy
   - 2.6 apply materials, textures and colour
   - 2.7 create sources of illumination
   - 2.8 render the model
   - 2.9 output the rendered image
3. **present the model**
4. **include the model in a portfolio**
   - 4.1 participate in a final critique
   - 4.2 include images and/or animation of the model in a portfolio
5. **identify copyright restrictions and permissions and put them into practice**
6. **apply consistent and appropriate work station routines**
   - 6.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 6.2 demonstrate security for hardware, software, supplies and personal work
7. **demonstrate basic competencies**
   - 7.1 demonstrate fundamental skills to:
     - 7.1.1 communicate
     - 7.1.2 manage information
     - 7.1.3 use numbers
     - 7.1.4 think and solve problems
   - 7.2 demonstrate personal management skills to:
     - 7.2.1 demonstrate positive attitudes and behaviours
     - 7.2.2 be responsible
     - 7.2.3 be adaptable
     - 7.2.4 learn continuously
     - 7.2.5 work safely

7.3 demonstrate teamwork skills to:
    7.3.1 work with others
    7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals
8.2 identify steps to achieve goals

COURSE DES3165: PRESENTATION

Level: Advanced

Prerequisite: None

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 rendering. Presentation techniques are used to compose high quality images to communicate a design solution.

Parameters: Access to drawing tools, equipment and materials.

Supporting Courses: DES2065: Technical Design 2
DES2075: Technical Drafting 2
DES3065: Technical Design 3
DES3075: Technical Drafting 3

Outcomes: The student will:

1. **research and consider the various types of media that can be used to render illustrative drawings for a student-generated or teacher-specified designed item**
   - 1.1 select and use appropriate materials and/or software
   - 1.2 consider application and audience; e.g., trade show, community, town hall, formal/informal presentation
2. **use various rendering techniques and media to create high quality visual representations of design solutions**
   - 2.1 create a set of rendered drawings using appropriate tools and materials (e.g., water colour, marker pens, CAD) based on illustrative drawings from other courses or provided by the teacher
   - 2.2 select, propose and justify the media and techniques used to render the designed item for application and audience approval before completion
   - 2.3 render the design solution through the use of materials, textures and quality of light
3. **create and present the design solution**
   - 3.1 compose high quality illustrations; e.g., presentation software, pamphlets, photographs, collage and montage techniques, titles, text, bulletin board for visual presentation of design solutions
   - 3.2 present to an appropriate audience
4. **include the design solution in a portfolio**
   - 4.1 participate in a final critique
   - 4.2 use appropriate terminology within the context
   - 4.3 include examples of renderings in a portfolio
5. **identify copyright restrictions and permissions and put them into practice**
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems

6.2 demonstrate personal management skills to:
- 6.2.1 demonstrate positive attitudes and behaviours
- 6.2.2 be responsible
- 6.2.3 be adaptable
- 6.2.4 learn continuously
- 6.2.5 work safely

6.3 demonstrate teamwork skills to:
- 6.3.1 work with others
- 6.3.2 participate in projects and tasks

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

7.1 identify short-term and long-term goals

7.2 identify steps to achieve goals

COURSE DES3170: FUTURE OF DESIGN

Level: Advanced

Prerequisite: None

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

Parameters: Access to the Internet, drawing/modelling tools, equipment and materials.

Supporting Course: DES2060: Evolution of Design

Outcomes: The student will:

1. **identify future challenges designers will face**
   - 1.1 describe the role of designers in the future and some of the challenges they will face
   - 1.2 indicate how this role and these challenges differ from those currently faced by designers
2. **create a design solution; e.g., model, drawings, rendering or animation**
   - 2.1 write a design brief detailing a possible future problem to be solved; e.g., environmental, societal
   - 2.2 identify and structure a possible design solution by:
     - 2.2.1 researching the future of design and applying what is learned to the design solution
     - 2.2.2 using new and emerging technology or techniques in the solution
   - 2.3 provide analysis and/or research supporting the design solution
   - 2.4 produce the solution
3. **include the design solution in a portfolio**
   - 3.1 participate in a final critique
   - 3.2 use appropriate terminology within the context
   - 3.3 include examples of the solution in a portfolio
4. **identify copyright restrictions and permissions and put them into practice**
5. **apply consistent and appropriate work station routines**
   - 5.1 demonstrate good health and safety practices; e.g., posture, positioning of hardware and furniture
   - 5.2 demonstrate security for hardware, software, supplies and personal work
6. **demonstrate basic competencies**
   - 6.1 demonstrate fundamental skills to:
     - 6.1.1 communicate
     - 6.1.2 manage information
     - 6.1.3 use numbers
     - 6.1.4 think and solve problems
   - 6.2 demonstrate personal management skills to:
     - 6.2.1 demonstrate positive attitudes and behaviours
     - 6.2.2 be responsible
     - 6.2.3 be adaptable
     - 6.2.4 learn continuously
     - 6.2.5 work safely
   - 6.3 demonstrate teamwork skills to:
     - 6.3.1 work with others
     - 6.3.2 participate in projects and tasks

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

7.1 identify short-term and long-term goals

7.2 identify steps to achieve goals

COURSE DES3910: DES PROJECT D

Level: Advanced

Prerequisite: None

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

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

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

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

Outcomes:

The teacher/student will:

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

The student will:

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

3.4 evaluate the project and/or performance, indicating the:
    3.4.1 processes and strategies used
    3.4.2 recommendations on how the project and/or performance could have been improved

4. identify copyright restrictions and permissions and put them into practice

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:
    5.1.1 communicate
    5.1.2 manage information
    5.1.3 use numbers
    5.1.4 think and solve problems

5.2 demonstrate personal management skills to:
    5.2.1 demonstrate positive attitudes and behaviours
    5.2.2 be responsible
    5.2.3 be adaptable
    5.2.4 learn continuously
    5.2.5 work safely

5.3 demonstrate teamwork skills to:
    5.3.1 work with others
    5.3.2 participate in projects and tasks

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

6.1 identify short-term and long-term goals

6.2 identify steps to achieve goals

COURSE DES3920: DES PROJECT E

Level: Advanced

Prerequisite: None

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

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

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

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

Outcomes:

The teacher/student will:

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

The student will:

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

3.4 evaluate the project and/or performance, indicating the:
    3.4.1 processes and strategies used
    3.4.2 recommendations on how the project and/or performance could have been improved

4. identify copyright restrictions and permissions and put them into practice

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:
    5.1.1 communicate
    5.1.2 manage information
    5.1.3 use numbers
    5.1.4 think and solve problems

5.2 demonstrate personal management skills to:
    5.2.1 demonstrate positive attitudes and behaviours
    5.2.2 be responsible
    5.2.3 be adaptable
    5.2.4 learn continuously
    5.2.5 work safely

5.3 demonstrate teamwork skills to:
    5.3.1 work with others
    5.3.2 participate in projects and tasks

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

6.1 identify short-term and long-term goals

6.2 identify steps to achieve goals

COURSE DES3950: DES ADVANCED PRACTICUM

Level: Advanced

Prerequisite: None

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

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

Outcomes: The student will:

1. perform assigned tasks and responsibilities, as required by the organization granting the credential(s) or articulation

- 1.1 identify regulations and regulatory bodies related to the credential(s) or articulation
- 1.2 describe personal roles and responsibilities, including:
  - 1.2.1 key responsibilities
  - 1.2.2 support functions/responsibilities/expectations
  - 1.2.3 code of ethics and/or conduct
- 1.3 describe personal work responsibilities and categorize them as:
  - 1.3.1 routine tasks; e.g., daily, weekly, monthly, yearly
  - 1.3.2 non-routine tasks; e.g., emergencies
  - 1.3.3 tasks requiring personal judgement
  - 1.3.4 tasks requiring approval of a supervisor
- 1.4 demonstrate basic employability skills and perform assigned tasks and responsibilities related to the credential(s) or articulation

2. analyze personal performance in relation to established standards

- 2.1 evaluate application of the attitudes, skills and knowledge developed in related CTS courses
- 2.2 evaluate standards of performance in terms of:
  - 2.2.1 quality of work
  - 2.2.2 quantity of work
- 2.3 evaluate adherence to workplace legislation related to health and safety
- 2.4 evaluate the performance requirements of an individual who is trained, experienced and employed in a related occupation in terms of:
  - 2.4.1 training and certification
  - 2.4.2 interpersonal skills
  - 2.4.3 technical skills
  - 2.4.4 ethics

3. demonstrate basic competencies

3.1 demonstrate fundamental skills to:

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

3.2 demonstrate personal management skills to:

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

3.3 demonstrate teamwork skills to:

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

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

4.1 identify short-term and long-term goals

4.2 identify steps to achieve goals