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INTRODUCTION TO DESIGN
DRAFTING (9)

15S/15E/15M

10S/10E/10M

A Design Drafting Course

8434 INTRODUCTION TO DESIGN DRAFTING (9)

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Course Description

Introduction to Design Drafting is intended for students wishing to sample architectural/engineering/interior design drafting.

Curriculum content focuses on an exploration of design drafting. The emphasis will be on exploring artistic and technical computer drawings using project-based activities. Students will present their design solutions to others.

Topics include introductions to the following:

- freehand sketching
- principles of design
- drafting standards
- materials and processes
- computer modelling
- architectural/engineering basics

The course includes an exploration of safety, employability skills, career development, sustainability, and new and emerging technologies in design drafting.

Cross-curricular learning outcomes, which include those in design drafting math, science, and the interpretation of technical documents, are to be integrated into the course.

The learning outcomes are organized by Technology Fundamentals (F), Technology Skills (S), and Professional Practice (P) strands. For instructional purposes, the sequence of learning outcomes and the learning outcomes included in each unit of study can vary based on the projects within the course.

Goal 1: Solve problems using the **design process.**

GLO 1.1: Define design problems.

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| SLO 9.F.1.1.1 | Identify a structured model to solve basic problems. |
| SLO 9.F.1.1.2 | Identify design problems. |
| SLO 9.S.1.1.1 | List the steps required to solve a design problem. |
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GLO 1.2: Research and analyze verbal and numeric **information** for design solutions.

- SLO 9.F.1.2.1 List the factors (e.g., materials, cost, manufacturing processes) that influence design.
 - SLO 9.F.1.2.2 Demonstrate an awareness of sustainability as it relates to design (e.g., materials used, social impact).
 - SLO 9.F.1.2.3 Demonstrate an awareness of universal design.
 - SLO 9.F.1.2.4 Demonstrate an awareness of aesthetic principles.
 - SLO 9.F.1.2.5 Identify common research methods used in design.
 - SLO 9.S.1.2.1 Research information to solve design problems.
 - SLO 9.S.1.2.2 Include sustainable concepts in designs.
 - SLO 9.S.1.2.3 Include aesthetic principles in designs.
 - SLO 9.S.1.2.4 Identify possible solutions for design problems.
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GLO 1.3: Synthesize information and ideas to create design solutions.

- SLO 9.F.1.3.1 Demonstrate an awareness that the selection of design solutions is often influenced by factors (e.g., cost, materials, customer request).
 - SLO 9.F.1.3.2 Identify techniques used for 2-D and isometric sketching.
 - SLO 9.S.1.3.1 Select design solutions based on provided criteria and related research.
 - SLO 9.S.1.3.2 Use freehand sketches and notes to solve basic design drafting problems.
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Goal 2: Communicate design solutions.

GLO 2.1: Prepare computer models of design solutions.

- SLO 9.F.2.1.1 Identify the function of computer models (e.g., visualization, model to working drawing).
 - SLO 9.F.2.1.2 Define geometric construction principles.
 - SLO 9.S.2.1.1 Create models of design solutions.
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GLO 2.2: Prepare working and presentation drawings and documents.

- SLO 9.F.2.2.1 Identify the differences between working and presentation drawings.

Layout (F)

SLO 9.F.2.2.2 Identify the components (e.g., title block, border, view arrangements) of a drawing.

SLO 9.F.2.2.3 Identify the standards related to working drawing view selection and placement.

Line Work (F)

SLO 9.F.2.2.4 Identify basic line types (e.g., object, hidden, centre, dimension, extension, section, cutting plane, break) and uses.

Dimensioning and Annotating (F)

SLO 9.F.2.2.5 Identify the purpose and rules of dimensioning.

SLO 9.F.2.2.6 Identify the purpose of notes and annotations.

Layout (S)

SLO 9.S.2.2.1 Use freehand sketches to arrange drawing layouts.

SLO 9.S.2.2.2 Create working drawings following view selection (e.g., single, orthographic, section, auxiliary, isometric, oblique) and placement standards.

Line Work (S)

SLO 9.S.2.2.3 Select and use line types (e.g., object, hidden, centre, construction, extension, dimension lines) to construct a drawing to standards.

SLO 9.S.2.2.4 Apply material symbols to full and half section views.

Dimensioning and Annotating (S)

SLO 9.S.2.2.5 Apply placement, styles, and rules of dimensioning.

SLO 9.S.2.2.6 Apply the placement, style, size of text, and leaders for notes and abbreviations.

Goal 3: Use appropriate **materials and processes** of building/manufacturing.

GLO 3.1: Describe **materials** used in design solutions.

SLO 9.F.3.1.1 Explain the importance of materials notes on a drawing.

SLO 9.S.3.1.1 List materials used in design solutions.

SLO 9.S.3.1.2 Include materials notes in drawings.

GLO 3.2: Describe **building/manufacturing processes** used in design solutions.

No applicable SLOs.

Goal 4: Present design solutions.**GLO 4.1: Plan and organize presentations** of design solutions.

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| SLO 9.F.4.1.1 | Identify presentation methods (e.g., design briefs, sketches, drawings). |
| SLO 9.S.4.1.1 | Follow presentation methods (e.g., oral, written, graphic). |
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GLO 4.2: Use presentation production methods.

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| SLO 9.F.4.2.1 | Identify the elements (e.g., rationale, functionality, research) of a design brief. |
| SLO 9.S.4.2.1 | Create sketches and design briefs to support design solutions. |
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GLO 4.3: Present/defend design solutions.

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| SLO 9.F.4.3.1 | Identify elements (e.g., clarity, conciseness) of effective verbal communication. |
| SLO 9.F.4.3.2 | Demonstrate an awareness of competitions related to design drafting. |
| SLO 9.S.4.3.1 | Present design solutions to an audience (e.g., peer, teacher). |
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Goal 5: Describe and apply the common tools and equipment used in design drafting.**GLO 5.1: Describe and use drawing and modelling tools and equipment.**

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| SLO 9.F.5.1.1 | Identify manual drafting tools and media. |
| SLO 9.F.5.1.2 | Identify physical modelling tools (e.g., scissors, knives, saws). |
| SLO 9.F.5.1.3 | Identify measuring devices (e.g., rulers, tape measures, scales, calipers). |
| SLO 9.S.5.1.1 | Use manual drafting tools and media (e.g., architectural, engineering, and metric scales, pencils, set squares, compass, t-squares, protractors). |
| SLO 9.S.5.1.2 | Use basic physical modelling tools (e.g., scissors, knives, saws, tape measures, calipers). |
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GLO 5.2: Describe and use computer hardware and equipment.

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| SLO 9.F.5.2.1 | Identify common computer hardware. |
| SLO 9.F.5.2.2 | Identify basic hardware problems (e.g., power, cords, device connections). |
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SLO 9.S.5.2.1 Operate common computer hardware (e.g., computer, three-button mouse, printers, monitors).

GLO 5.3: Describe and use **software**.

SLO 9.F.5.3.1 Identify industry standard CADD software.
SLO 9.F.5.3.2 Identify office- and design-related software.
SLO 9.F.5.3.3 Identify file management systems and practices (e.g., file organization, network navigation).
SLO 9.S.5.3.1 Use industry standard CADD software.
SLO 9.S.5.3.2 Use office- and design-related software.
SLO 9.S.5.3.3 Manage and organize project files.

Goal 6: Describe and apply transferable **cross-curricular knowledge and skills** that relate to design drafting.

GLO 6.1: Describe and apply **mathematical concepts** as they relate to design drafting.

SLO 9.F.6.1.1 Identify metric and imperial systems of measurement.
SLO 9.F.6.1.2 Add and subtract fractions and decimals.
SLO 9.F.6.1.3 Identify symbols related to imperial measurement (e.g., 2'-3").
SLO 9.F.6.1.4 Identify equivalent forms of fractions (e.g., $\frac{1}{8}$ " = $\frac{2}{16}$ ", lowest common denominator).
SLO 9.F.6.1.5 Identify standard drafting scales (e.g., relationship between ratios and fractions).
SLO 9.F.6.1.6 Identify the Cartesian coordinate system in relation to CADD.
SLO 9.S.6.1.1 Extract data using measuring devices (e.g., rulers, tape measures, scales, calipers).
SLO 9.S.6.1.2 Calculate the length of geometric shapes.
SLO 9.S.6.1.3 Verify dimensions using estimation.
SLO 9.S.6.1.4 Use ratios for scale drawing.

GLO 6.2: Read, interpret, and communicate information.

SLO 9.F.6.2.1 Describe research and evaluation techniques.
SLO 9.S.6.2.1 Find, collect, and evaluate information (text, images, data, audio, and video) from given resources.
SLO 9.S.6.2.2 Communicate using the language and terminology of design drafting.

GLO 6.3: Understand **scientific concepts** as they apply to design drafting.

- SLO 9.F.6.3.1 Identify the factors that influence material use (e.g., strength, density, combustibility, buoyancy).
- SLO 9.F.6.3.2 Describe strengths of shapes.
- SLO 9.F.6.3.3 Appreciate the relationship between the model/drawing and physical object.

Goal 7: Demonstrate an awareness of **sustainability** as it pertains to design drafting.

GLO 7.1: Understand the impact of architectural/engineering design on the **environment**.

- SLO 9.F.7.1.1 Define sustainability as it relates to the environment.

GLO 7.2: Describe the impact of architectural/engineering design on **human health and well-being**.

- SLO 9.F.7.2.1 Define sustainability as it relates to human health and well-being.

GLO 7.3: Recognize the **economic impact** of sustainable practices in architectural/engineering design.

- SLO 9.F.7.3.1 Define sustainability as it relates to the economy.

Goal 8: Understand the **evolution** of design drafting, including its **technological progression and emerging trends**.

GLO 8.1: Describe the **evolution of design drafting, including its technological progression and emerging trends**.

- SLO 9.F.8.1.1 Demonstrate an appreciation of traditional design drafting tools, equipment, materials, and drawings.
- SLO 9.F.8.1.2 Demonstrate an appreciation of the impact of developing trends and emerging technologies on design drafting.

Goal 9: Follow the **ethical and legal standards** in design drafting.

GLO 9.1: Incorporate the local and national **building codes and standards as well as manufacturing and engineering standards** into designs.

- SLO 9.P.9.1.1 Discuss the need for standards and codes in design drafting.
 - SLO 9.P.9.1.2 Follow ISO and ANSI standards to produce drawings.
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GLO 9.2: Describe the **ethical expectations** of designers.

SLO 9.P.9.2.1 Practise ethical and responsible use of computer hardware and software.

SLO 9.P.9.2.2 Appreciate the ethical responsibilities of producing accurate design drafting documents.

Goal 10: Demonstrate a knowledge of and ability to recognize and apply appropriate **health and safety** requirements and practices to maintain a safe workplace.

GLO 10.1: Demonstrate an awareness of **rights, responsibilities, and safety procedures** for specific tools, equipment, and working environments.

SLO 9.P.10.1.1 Demonstrate and value safe work practices and procedures.

SLO 9.P.10.1.2 Follow proper classroom practices (e.g., keep work area clean and organized, avoid horseplay, clean keyboards with sanitizer), which help protect the safety and health of students and staff.

SLO 9.P.10.1.3 Demonstrate ergonomically correct procedures to avoid injury (e.g., stress, strain).

SLO 9.P.10.1.4 Identify personal responsibility for health and safety.

SLO 9.P.10.1.5 Identify and use the safety features of tools and equipment.

SLO 9.P.10.1.6 Follow emergency evacuation procedures.

SLO 9.P.10.1.7 Use appropriate aids to minimize risk of injury.

SLO 9.P.10.1.8 Use appropriate personal protective equipment.

SLO 9.P.10.1.9 Locate first aid stations and fire extinguishers.

GLO 10.2: Describe **health and safety laws and regulations**.

SLO 9.P.10.2.1 Describe the reporting process for injuries.

Goal 11: Demonstrate **employability skills** required in design drafting.

GLO 11.1: Demonstrate fundamental **employability skills**.

SLO 9.P.11.1.1 Explain the importance of employability skills.

SLO 9.P.11.1.2 Ask questions to clarify written or oral instructions.

- SLO 9.P.11.1.3 Identify sources of information and resources for design drafting.
- SLO 9.P.11.1.4 Identify problems and follow a problem-solving process.
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GLO 11.2: Demonstrate **personal management** skills.

- SLO 9.P.11.2.1 Actively participate in a positive manner.
- SLO 9.P.11.2.2 Complete tasks within stated time frames.
- SLO 9.P.11.2.3 Demonstrate accountability for own actions.
- SLO 9.P.11.2.4 Accept feedback, comments, and contributions from others.
- SLO 9.P.11.2.5 Listen and respond in order to understand and learn.
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GLO 11.3: Demonstrate **teamwork** skills.

- SLO 9.P.11.3.1 Actively participate in the work of a group.
- SLO 9.P.11.3.2 Participate in the classroom/shop learning activities.
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Goal 12: Describe **career opportunities** in design drafting.

GLO 12.1: Describe **post-secondary opportunities** related to design drafting.

- SLO 9.P.12.1.1 Identify post-secondary paths for design drafting (e.g., requirements, educational institutions, programs).
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GLO 12.2: Describe **career opportunities** available in design drafting across industries.

- SLO 9.P.12.2.1 Explore careers related to design drafting.
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GLO 12.3: Create, maintain, and present a **portfolio**.

- SLO 9.P.12.3.1 Collect samples for a design drafting portfolio.
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