



8437

ARCHITECTURAL DESIGN
DRAFTING (11B)

30S/30E/30M

A Design Drafting Course

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Course Description

Architectural Design Drafting is intended for students continuing in the specialization phase of architectural design drafting.

Curriculum content focuses on the design of a residence. Students will present their design solutions to others.

Topics include the following:

- freehand sketching
- principles of design
- drafting and construction standards
- construction materials and processes
- computer modelling and selection of building components (e.g., wall, window, floor, roof, foundation)
- floor plan and elevation drawings
- interior design

The course includes an emphasis on safety, employability skills, career development, sustainability, and new and emerging technologies related to architectural design.

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.

- SLO 11B.F.1.1.1 Describe the feedback process in a structured problem-solving model.
- SLO 11B.F.1.1.2 Define design problems.
- SLO 11B.S.1.1.1 Use a structured model to solve, refine, and revise architectural problems.

GLO 1.2: Research and analyze verbal and numeric **information** for design solutions.

- SLO 11B.F.1.2.1 Identify different house types.
 - SLO 11B.F.1.2.2 Identify architectural design principles, including work triangle, bathroom design, circulation, room shape, size and area, space zoning, layout, orientation, furniture layouts, and ergonomics.
 - SLO 11B.F.1.2.3 Consider building processes, materials, costs, and the building code's influence on design.
 - SLO 11B.F.1.2.4 Compare various sustainable architectural construction materials and processes (e.g., energy and resource consumption).
 - SLO 11B.F.1.2.5 Identify universal design principles as specified in building codes.
 - SLO 11B.F.1.2.6 Consider aesthetic principles (e.g., colour, balance, texture, form, proportion) in relation to interior and exterior residential design.
 - SLO 11B.S.1.2.1 Incorporate architectural design principles into design solutions (e.g., sketches, notes).
 - SLO 11B.S.1.2.2 Incorporate architectural aesthetic principles, sustainable concepts, and universal design principles into design solutions.
 - SLO 11B.S.1.2.3 Gather measurement data about a residential construction project.
 - SLO 11B.S.1.2.4 Analyze and predict consequences of design modifications.
 - SLO 11B.S.1.2.5 Research and reference information for residential construction from various sources, including building codes, span tables, manufacturers' specifications, and site data.
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GLO 1.3: Synthesize information and ideas to create design solutions.

- SLO 11B.F.1.3.1 Identify influences (e.g., cost, materials) that can impact the decision-making process for architectural design solutions.
- SLO 11B.F.1.3.2 Identify sketching techniques related to specialized media (e.g., charcoal, paint, felt pen, pen and ink).
- SLO 11B.F.1.3.3 Describe the relationship between the plan view and the elevations.

- SLO 11B.S.1.3.1 Select design solutions based on research into architectural topics (e.g., room layout, styles, trends, sizes, space zoning).
 - SLO 11B.S.1.3.2 Select construction systems (e.g., wall, floor, foundation, roof, doors, windows) based on research.
 - SLO 11B.S.1.3.3 Create freehand sketches to solve architectural design problems.
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Goal 2: Communicate design solutions.

GLO 2.1: Prepare **computer models** of design solutions.

- SLO 11B.F.2.1.1 Describe the function of computer models (e.g., visualization, model to working drawing).
 - SLO 11B.F.2.1.2 Describe the process of creating foundation, wall, and floor systems using CADD software.
 - SLO 11B.S.2.1.1 Create a computer model using foundation, wall, and floor systems, window and door components, and standard parts.
 - SLO 11B.S.2.1.2 Use a computer model for visualization and to create working drawings, including floor plans and elevations.
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GLO 2.2: Prepare **working and presentation drawings and documents.**

Layout (F)

- SLO 11B.F.2.2.1 Identify components (e.g., title blocks, border, sheet sizes, sheet layout, architectural scales) of an architectural drawing.
- SLO 11B.F.2.2.2 Identify architectural symbols (e.g., walls, doors, windows, roofs, structural members, stairs, plumbing fixtures, materials) for floor plan and elevation drawings.
- SLO 11B.F.2.2.3 Read and interpret tags and detailed schedule tables.
- SLO 11B.F.2.2.4 Recognize the need for auxiliary views when creating elevation drawings.

Line Work (F)

- SLO 11B.F.2.2.5 Identify architectural line types (e.g., object, hidden, centre, construction, extension, and dimension lines, break lines, phantom lines, hatch lines) and their intended use.

Dimensioning and Annotating (F)

- SLO 11B.F.2.2.6 Identify architectural dimensioning and annotation standards.

Layout (S)

SLO 11B.S.2.2.1 Use the components (e.g., title blocks, border, sheet sizes, sheet layout, architectural scales, revision columns) of an architectural drawing.

SLO 11B.S.2.2.2 Create floor plans and interior and exterior elevation working drawings using architectural symbols (e.g., walls, doors, windows, foundation systems, roofs, structural members, stairs, materials) to industry standard.

SLO 11B.S.2.2.3 Create schedule tables (e.g., window, door, room finish).

Line Work (S)

SLO 11B.S.2.2.4 Select and use line types for architectural applications based on standards.

Dimensioning and Annotating (S)

SLO 11B.S.2.2.5 Use industry standard dimensions and annotations.

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

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

SLO 11B.F.3.1.1 Identify materials and equipment used for foundation, wall, and floor systems, and windows and doors.

SLO 11B.F.3.1.2 Identify material and equipment estimation techniques.

SLO 11B.S.3.1.1 Select materials and components for foundation, wall, and floor systems, and windows and doors.

SLO 11B.S.3.1.2 Generate materials lists for foundation, wall, and floor systems, and windows and doors.

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

SLO 11B.F.3.2.1 Identify and describe residential construction methods and principles for foundation, wall, and floor systems, and windows and doors.

SLO 11B.F.3.2.2 Define project management.

Goal 4: Present design solutions.

GLO 4.1: Plan and organize presentations of design solutions.

SLO 11B.F.4.1.1 Identify traditional and digital architectural presentation methods.

SLO 11B.S.4.1.1 Select written and visual presentation methods for design solutions (e.g., oral, written, graphic, physical or digital 3-D model).

GLO 4.2: Use presentation production methods.

SLO 11B.F.4.2.1 Differentiate among the formats and functions of technical reports, design briefs, and scope-of-work documents.

SLO 11B.F.4.2.2 Differentiate between the format and function of visual presentation formats (e.g., presentation software, renderings, physical models).

SLO 11B.S.4.2.1 Create design briefs to support architectural design solutions.

SLO 11B.S.4.2.2 Create visual presentations to support architectural design solutions.

GLO 4.3: Present/defend design solutions.

SLO 11B.F.4.3.1 Describe elements (e.g., clear and concise communication, appearance and dress, enunciation and volume, body language) of effective presentations.

SLO 11B.F.4.3.2 Discuss out-of-school student competitions related to architectural design drafting.

SLO 11B.S.4.3.1 Present design solutions to an audience (e.g., group) and reflect on feedback.

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.**

SLO 11B.S.5.1.1 Use sketching tools and media.

SLO 11B.S.5.1.2 Use physical modelling tools (e.g., scissors, knives, saws).

SLO 11B.S.5.1.3 Use measuring devices (e.g., rulers, tape measures, architectural and metric scales, calipers).

GLO 5.2: Describe and use **computer hardware and equipment.**

SLO 11B.F.5.2.1 Identify basic hardware problems (e.g., power, cords, device connections) and maintenance procedures.

SLO 11B.S.5.2.1 Operate input devices (e.g., digital camera, scanner).

SLO 11B.S.5.2.2 Operate output devices (e.g., printers, plotters).

SLO 11B.S.5.2.3 Troubleshoot computer and printer/plotter problems.

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

- SLO 11B.F.5.3.1 Identify industry standard architectural CADD software.
- SLO 11B.F.5.3.2 Discuss the application of office software in the design and presentation process.
- SLO 11B.S.5.3.1 Use industry standard architectural CADD software.
- SLO 11B.S.5.3.2 Use office- and design-related software.
- SLO 11B.S.5.3.3 Manage project data using CADD software.
- SLO 11B.S.5.3.4 Manage and organize project files.
- SLO 11B.S.5.3.5 Use and manipulate digital images to obtain and record information (e.g., portfolio collection, research).
- SLO 11B.S.5.3.6 Use information communication technologies (e.g., RSS feeds, blogs, technical websites, discussion boards) related to architectural design drafting.

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 11B.F.6.1.1 Demonstrate an understanding of metric and imperial conversions.
 - SLO 11B.F.6.1.2 Identify the buildable levels of precision used in architectural drawings.
 - SLO 11B.F.6.1.3 Identify metric site-grading data and convert to establish footing depth.
 - SLO 11B.F.6.1.4 Demonstrate an understanding of straight-line interpolation.
 - SLO 11B.S.6.1.1 Select and use architectural (imperial or metric) units and formats of measurement to dimension architectural drawings.
 - SLO 11B.S.6.1.2 Extract architectural data using measuring devices.
 - SLO 11B.S.6.1.3 Establish footing depth using metric site-grading data.
 - SLO 11B.S.6.1.4 Perform straight-line interpolation calculations when reading span tables.
 - SLO 11B.S.6.1.5 Calculate the length and area of buildings and individual rooms.
 - SLO 11B.S.6.1.6 Calculate volume for foundation systems (e.g., concrete, gravel).
 - SLO 11B.S.6.1.7 Estimate material costs.
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GLO 6.2: Read, interpret, and communicate information.

- SLO 11B.F.6.2.1 Identify sources of design information (e.g., building code, material specifications, aesthetic and design principles, restrictive covenants).
 - SLO 11B.S.6.2.1 Organize and record design information from oral, visual, material, print, or electronic sources.
 - SLO 11B.S.6.2.2 Read and interpret design information from text, tables, charts, and graphs.
 - SLO 11B.S.6.2.3 Communicate using the language and terminology of architectural design drafting.
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GLO 6.3: Understand scientific concepts as they apply to design drafting.

- SLO 11B.F.6.3.1 Identify the aesthetic characteristics and properties of materials used in the architectural design solutions (e.g., species of wood, manufactured versus natural materials, concrete finishing).
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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 11B.F.7.1.1 Identify environmental sustainability factors that influence architectural design solutions (e.g., building orientation, landscaping).
 - SLO 11B.F.7.1.2 Appreciate the environmental factors that have an impact on the building design.
 - SLO 11B.F.7.1.3 Identify sustainable construction certifications (e.g., R-2000).
 - SLO 11B.S.7.1.1 Incorporate environmental sustainability factors in architectural design solutions.
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GLO 7.2: Describe the impact of architectural/engineering design on human health and well-being.

- SLO 11B.F.7.2.1 Identify human health and well-being sustainability factors that influence architectural design solutions (e.g., building code [spacing on handrails], window area, colour selection, building orientation, ventilation).
- SLO 11B.F.7.2.2 Appreciate the human health and well-being sustainability factors that have an impact on building design.

SLO 11B.S.7.2.1 Incorporate human health and well-being sustainability factors in architectural design solutions.

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

SLO 11B.F.7.3.1 Identify the economic sustainability factors that influence architectural design solutions (e.g., local versus imported products, cradle to cradle, recycled materials).

SLO 11B.F.7.3.2 Appreciate the economic impact of sustainability factors on architectural design solutions.

SLO 11B.S.7.3.1 Incorporate economic sustainability factors in architectural design solutions.

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 11B.F.8.1.1 Discuss emerging trends related to the tools and equipment of architectural design.

SLO 11B.F.8.1.2 Describe emerging styles and trends (e.g., building use, life of building, evolution of building, flexible housing, and home office) and their impact on architectural design.

SLO 11B.F.8.1.3 Research past/historical/contemporary examples of architectural design.

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 11B.P.9.1.1 Identify the commonly used standards for architectural drafting.

SLO 11B.P.9.1.2 Produce technical drawings to CAN/CSA, ISO, and ANSI standards.

SLO 11B.P.9.1.3 Follow building codes to create floor plans and elevations.

SLO 11B.P.9.1.4 Demonstrate an awareness of variations in CADD standards (e.g., discipline specific, trade specific, organization).

SLO 11B.P.9.1.5 Describe the legal (e.g., permits, bylaws, building code, covenants) and contractual (e.g., contractor, material supplies) obligations of drawings.

GLO 9.2: Describe the **ethical expectations** of designers.

SLO 11B.P.9.2.1 Practise ethical and responsible use of computer hardware and software.

SLO 11B.P.9.2.2 Consider the ethical implications of compromise in making design decisions (e.g., costs, inadequate design).

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 11B.P.10.1.1 Demonstrate and value safe work practices and procedures.

SLO 11B.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 11B.P.10.1.3 Demonstrate ergonomically correct procedures to avoid injury (e.g., stress, strain).

SLO 11B.P.10.1.4 Demonstrate personal responsibility for health and safety.

SLO 11B.P.10.1.5 Demonstrate and use the safety features of tools and equipment.

SLO 11B.P.10.1.6 Follow emergency evacuation procedures.

SLO 11B.P.10.1.7 Use appropriate aids to minimize risk of injury.

SLO 11B.P.10.1.8 Use appropriate personal protective equipment.

SLO 11B.P.10.1.9 Locate first aid stations and fire extinguishers.

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

SLO 11B.P.10.2.1 Describe the reporting process for injuries.

SLO 11B.P.10.2.2 Identify WHMIS symbols and terminology, and follow WHMIS guidelines, including the location of MSDS sheets.

SLO 11B.P.10.2.3 Comply with health and safety legislation and practices.

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

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

- SLO 11B.P.11.1.1 Describe the importance of employability skills in school, work, and daily life.
 - SLO 11B.P.11.1.2 Listen and ask questions to clarify problems and instructions.
 - SLO 11B.P.11.1.3 Locate, gather, and organize design drafting information using appropriate technology and information systems.
 - SLO 11B.P.11.1.4 Assess situations and identify problems and possible solutions.
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GLO 11.2: Demonstrate **personal management** skills.

- SLO 11B.P.11.2.1 Demonstrate interest, initiative, and effort.
 - SLO 11B.P.11.2.2 Manage time to complete tasks/projects within stated time frames.
 - SLO 11B.P.11.2.3 Demonstrate accountability for own actions and for the actions of one's team.
 - SLO 11B.P.11.2.4 Respond constructively to changes.
 - SLO 11B.P.11.2.5 Demonstrate a willingness to learn continuously.
 - SLO 11B.P.11.2.6 Appreciate the need for continuous learning in technologically dependent occupations.
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GLO 11.3: Demonstrate **teamwork** skills.

- SLO 11B.P.11.3.1 Be respectful toward, open to, and supportive of the thoughts, opinions, and contributions of others in a group.
- SLO 11B.P.11.3.2 Contribute information and skills to achieve the goals of a group.
- SLO 11B.P.11.3.3 Contribute willingly to classroom/shop learning activities.
- SLO 11B.P.11.3.4 Accept assistance from and offer it to others.

Goal 12: Describe **career opportunities** in design drafting.

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

SLO 11B.P.12.1.1 Identify post-secondary paths and articulation opportunities for architectural design drafting (e.g., requirements, educational institutions, programs).

GLO 12.2: Describe **career opportunities** available in design drafting across industries.

SLO 11B.P.12.2.1 Explore architectural careers related to the design drafting industry.

GLO 12.3: Create, maintain, and present a **portfolio**.

SLO 11B.P.12.3.1 Collect architectural samples for a design drafting portfolio.

