



8649

APPLIED ARCHITECTURAL  
DESIGN DRAFTING (12C)

40S/40E/40M

A Design Drafting Course



# 8649 APPLIED ARCHITECTURAL DESIGN DRAFTING (12C) 40S/40E/40M

## Course Description

Applied Architectural Design Drafting is intended for students transitioning to industry or post-secondary education from design drafting. Teachers have the flexibility to focus on either applied architectural and/or applied civil engineering projects.

Curriculum content provides for the application of the design process for client-specific residential architectural and/or civil engineering construction projects. Communication with the client and construction professionals will determine the project scope and proposed design solution. Students will design and modify their proposal and create the required presentation and working drawings. Students will present their design solutions to others.

Students in the course will apply safety procedures and employability skills independently. Students will demonstrate their knowledge, skills, and attitudes in the areas of career and portfolio development, sustainability, and new and emerging technologies in architectural 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.

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

#### **GLO 1.1: Define design problems.**

- SLO 12C.F.1.1.1 Collaborate with a client to define design problems.
- SLO 12C.S.1.1.1 Use a structured model to solve, refine, and revise architectural and/or civil engineering problems and to create construction drawings.

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

- SLO 12C.F.1.2.1 Evaluate solutions based on architectural design principles.

- SLO 12C.F.1.2.2 Assess the factors that influence design (e.g., sustainability, universal design, client and municipal requirements, aesthetics).
  - SLO 12C.F.1.2.3 Demonstrate an awareness of design drafting fundamentals and conventions as they relate to architectural and/or civil engineering drawings.
  - SLO 12C.S.1.2.1 Develop a bubble diagram and sketches based on the design factors (e.g., sustainability, universal design, client and municipal requirements, and aesthetics).
  - SLO 12C.S.1.2.2 Reference specification tables to select building and infrastructure components.
  - SLO 12C.S.1.2.3 Analyze and predict consequences of design modifications.
  - SLO 12C.S.1.2.4 Research and reference information for residential construction and/or civil engineering from various sources.
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**GLO 1.3: Synthesize** information and ideas to create design solutions.

- SLO 12C.F.1.3.1 Identify influences (e.g., client and municipal requirements, cost, materials, building codes) that can impact the decision-making process for architectural and/or civil engineering design solutions.
  - SLO 12C.S.1.3.1 Select design solutions based on research for client and municipal requirements.
  - SLO 12C.S.1.3.2 Create freehand sketches using a variety of media to solve architectural and/or civil engineering design problems.
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**Goal 2: Communicate** design solutions.

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

- SLO 12C.F.2.1.1 Assess client and municipal requirements and select the process for creating building systems using CADD software.
  - SLO 12C.S.2.1.1 Create and modify computer models using building system components and/or civil infrastructure elements and following client and municipal requirements.
  - SLO 12C.S.2.1.2 Use a computer model for visualization and to create presentation and working drawings.
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**GLO 2.2: Prepare working and presentation drawings and documents.**

- SLO 12C.F.2.2.1 Read and interpret construction standards and building codes.
  - SLO 12C.F.2.2.2 Apply design drafting fundamentals and conventions to civil engineering drawings.
  - SLO 12C.S.2.2.1 Produce a set of drawings and documents that meets drafting standards and follows building codes.
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**Goal 3: Use appropriate materials and processes of building/manufacturing.**

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

- SLO 12C.F.3.1.1 Assess material and equipment selections based on client and municipal requirements.
  - SLO 12C.S.3.1.1 Select materials, components, and equipment for building systems and/or civil infrastructure projects.
  - SLO 12C.S.3.1.2 Generate materials lists as required by clients and municipalities.
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**GLO 3.2: Describe building/manufacturing processes used in design solutions.**

- SLO 12C.F.3.2.1 Assess residential construction methods and principles for building systems and/or civil infrastructure based on client and municipal requirements.
  - SLO 12C.F.3.2.2 Identify project management considerations (e.g., timelines, material supplies, project management software) for residential construction and/or civil infrastructure projects.
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**Goal 4: Present design solutions.**

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

- SLO 12C.F.4.1.1 Describe the effectiveness of various presentation methods.
  - SLO 12C.S.4.1.1 Select presentation methods based on client and municipal requirements.
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**GLO 4.2: Use presentation production methods.**

- SLO 12C.F.4.2.1 Assess written and visual presentation methods based on project complexity, budget, available time, and client and municipal requirements.

- SLO 12C.F.4.2.2 Identify techniques to create physical 3-D architectural and/or civil engineering models.
  - SLO 12C.S.4.2.1 Choose written and visual presentation methods to communicate effectively with clients and/or other stakeholders.
  - SLO 12C.S.4.2.2 Communicate effectively using presentation software incorporating design elements (e.g., formatting, layout, font size).
  - SLO 12C.S.4.2.3 Create physical models.
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**GLO 4.3: Present/defend design solutions.**

- SLO 12C.F.4.3.1 Assess and adapt the presentation and communication techniques (e.g., appearance and dress, enunciation and volume, body language) to the clients and/or other stakeholders.
  - SLO 12C.F.4.3.2 Revise solutions according to feedback from clients and/or other stakeholders.
  - SLO 12C.F.4.3.3 Research out-of-school student competitions related to architectural and/or civil engineering design drafting.
  - SLO 12C.S.4.3.1 Present design solutions to clients and/or other stakeholders and respond to questions and feedback.
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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.**

- SLO 12C.F.5.1.1 Identify specialized sketching tools and media (e.g., charcoal, paint, felt pen, pen and ink).
  - SLO 12C.F.5.1.2 Assess client project and select drawing and modelling tools and equipment.
  - SLO 12C.S.5.1.1 Use specialized sketching tools and media.
  - SLO 12C.S.5.1.2 Use physical modelling tools (e.g., scissors, knives, saws).
  - SLO 12C.S.5.1.3 Use measuring devices (e.g., rulers, tape measures, architectural, engineering, and metric scales, calipers).
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**GLO 5.2:** Describe and use **computer hardware and equipment.**

- SLO 12C.F.5.2.1 Assess client project and select computer hardware and equipment.
- SLO 12C.S.5.2.1 Use communication devices to interact with clients, industry experts, manufacturers, and suppliers.

- SLO 12C.S.5.2.2 Operate input devices (e.g., digital camera, scanner).
  - SLO 12C.S.5.2.3 Operate output devices (e.g., printers, plotters).
  - SLO 12C.S.5.2.4 Troubleshoot computer and printer/plotter problems.
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**GLO 5.3: Describe and use software.**

- SLO 12C.F.5.3.1 Assess the project in order to select the required software.
  - SLO 12C.S.5.3.1 Analyze and select software and tools necessary to complete the residential construction and/or civil engineering project.
  - SLO 12C.S.5.3.2 Demonstrate use of electronic communications technology.
  - SLO 12C.S.5.3.3 Use information communication technologies (e.g., RSS feeds, blogs, technical websites, discussion boards) related to design drafting.
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**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 12C.F.6.1.1 Select mathematical methods to solve architectural and/or civil engineering design problems.
  - SLO 12C.S.6.1.1 Perform mathematical calculations, conversions, and measurements as required for the project.
  - SLO 12C.S.6.1.2 Estimate material, equipment, and labour costs.
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**GLO 6.2: Read, interpret, and communicate** information.

- SLO 12C.F.6.2.1 Compare sources of design and technical information.
  - SLO 12C.S.6.2.1 Synthesize design and technical information from oral, visual, material, print, or electronic sources.
  - SLO 12C.S.6.2.2 Read, interpret, and apply design and technical information from text, tables, charts, and graphs.
  - SLO 12C.S.6.2.3 Communicate using the language and terminology of architectural and/or civil engineering design drafting.
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**GLO 6.3: Understand scientific concepts** as they apply to design drafting.

- SLO 12C.F.6.3.1 Compare and select materials based on aesthetic and scientific properties.

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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 12C.F.7.1.1 Analyze sustainable factors, materials, and building systems that affect architectural and/or civil engineering design solutions.
  - SLO 12C.F.7.1.2 Differentiate between the effect of the environment on a project and the project on the environment.
  - SLO 12C.F.7.1.3 Identify sustainable construction certifications (e.g., LEED).
  - SLO 12C.S.7.1.1 Select sustainable factors, materials, and building systems that affect architectural and/or civil engineering design solutions, and incorporate them into design solutions.
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**GLO 7.2:** Describe the impact of architectural/engineering design on **human health and well-being**.

- SLO 12C.F.7.2.1 Analyze sustainable factors, materials, and building and civil systems, and/or civil infrastructure that affect human health and well-being.
  - SLO 12C.F.7.2.2 Analyze the effect of a building and/or civil infrastructure on human health and well-being.
  - SLO 12C.S.7.2.1 Select and incorporate human health and well-being sustainability factors, materials, and building systems in architectural and civil engineering design and/or civil infrastructure solutions.
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**GLO 7.3:** Recognize the **economic impact** of sustainable practices in architectural/engineering design.

- SLO 12C.F.7.3.1 Analyze economic sustainable factors that affect the selection of materials and building systems in architectural and civil engineering projects.
- SLO 12C.F.7.3.2 Analyze the economic impact of sustainability factors, materials, and building systems on architectural and civil engineering projects.
- SLO 12C.S.7.3.1 Select economic sustainability factors, materials, and building systems that affect architectural and civil engineering projects.

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**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 12C.F.8.1.1 Demonstrate an appreciation of the changing role of the designer/draftsperson based on emerging trends and technologies.
- SLO 12C.F.8.1.2 Describe emerging trends and their impact on the selection of materials and building systems in architectural design and/or civil engineering infrastructure.

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**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 12C.P.9.1.1 Select the appropriate standard for architectural drafting and/or civil engineering infrastructure projects.
- SLO 12C.P.9.1.2 Produce technical drawings to CAN/CSA, ISO, and ANSI standards.
- SLO 12C.P.9.1.3 Interpret criteria from local and national building codes.
- SLO 12C.P.9.1.4 Select and use CADD standards (e.g., discipline specific, trade specific, organization) based on client and municipal requirements.
- SLO 12C.P.9.1.5 Produce architectural and/or civil engineering drawings to specifications required to obtain building permits.

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

- SLO 12C.P.9.2.1 Apply ethical practices in producing contract documents.

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**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 12C.P.10.1.1 Demonstrate and value safe work practices and procedures.

- SLO 12C.P.10.1.2 Demonstrate ergonomically correct procedures to avoid injury (e.g., stress, strain).
  - SLO 12C.P.10.1.3 Demonstrate personal responsibility for health and safety.
  - SLO 12C.P.10.1.4 Demonstrate the safety features of tools and equipment.
  - SLO 12C.P.10.1.5 Follow emergency evacuation procedures.
  - SLO 12C.P.10.1.6 Use appropriate aids to minimize risk of injury.
  - SLO 12C.P.10.1.7 Use appropriate personal protective equipment.
  - SLO 12C.P.10.1.8 Locate first aid stations and fire extinguishers.
  - SLO 12C.P.10.1.9 Demonstrate an awareness of external health and safety programs and certifications.
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**GLO 10.2:** Describe **health and safety laws and regulations**.

- SLO 12C.P.10.2.1 Describe the reporting process for injuries.
  - SLO 12C.P.10.2.2 Identify WHMIS symbols and terminology, and follow WHMIS guidelines, including the location of MSDS sheets.
  - SLO 12C.P.10.2.3 Comply with health and safety legislation and practices.
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**Goal 11:** Demonstrate **employability skills** required in design drafting.

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

- SLO 12C.P.11.1.1 Describe the importance of employability skills in school, work, and daily life.
  - SLO 12C.P.11.1.2 Listen and ask questions to clarify problems and instructions.
  - SLO 12C.P.11.1.3 Locate, gather, and organize design drafting information using appropriate technology and information systems.
  - SLO 12C.P.11.1.4 Assess situations and identify problems and possible solutions.
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**GLO 11.2:** Demonstrate **personal management** skills.

- SLO 12C.P.11.2.1 Demonstrate interest, initiative, and effort.
- SLO 12C.P.11.2.2 Manage time to complete tasks/projects within stated time frames.
- SLO 12C.P.11.2.3 Demonstrate accountability for own actions and for the actions of one's team.
- SLO 12C.P.11.2.4 Respond constructively to changes.

- SLO 12C.P.11.2.5 Demonstrate a willingness to learn continuously.
- SLO 12C.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 12C.P.11.3.1 Be respectful toward, open to, and supportive of the thoughts, opinions, and contributions of others in a group.
- SLO 12C.P.11.3.2 Contribute information and skills to achieve the goals of a group.
- SLO 12C.P.11.3.3 Contribute willingly to classroom/shop learning activities.
- SLO 12C.P.11.3.4 Accept assistance from and offer it to others.
- SLO 12C.P.11.3.5 Collaborate with peers and industry professionals.
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**Goal 12:** Describe **career opportunities** in design drafting.

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

- SLO 12C.P.12.1.1 Discuss the post-secondary application process (e.g., deadlines, forms, applications, scholarships).
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**GLO 12.2:** Describe **career opportunities** available in design drafting across industries.

- SLO 12C.P.12.2.1 Explore careers related to architecture and civil engineering.
- SLO 12C.P.12.2.2 Finalize transition plan (school to work/post-secondary).
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**GLO 12.3:** Create, maintain, and present a **portfolio**.

- SLO 12C.P.12.3.1 Reflect on and include a complete set of architectural and/or civil engineering documents for a project in a design drafting portfolio.
- SLO 12C.P.12.3.2 Present a design drafting portfolio.
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