



ARCHITECTURAL, BUILDING, CONSTRUCTION – TECHNICIAN (ARCTN 2021)

Preamble

The Canadian Technology Standards (CTS) are a collection of learning outcomes for Canada’s engineering technology and applied science profession at the technician and technologist level.

Stakeholders

The CTS may be utilized by accreditation bodies, provincial professional associations, educational institutions, government agencies, industry and others for the purposes accreditation, certification and other applications.

Educational Programs

The Architectural, Building and Construction CTS is relevant to programs including, but not limited to, architectural, building and construction at the at the technician level.

Learning Outcomes

This CTS list Discipline Learning Outcomes (DLO) which describe the significant and essential learning that students have achieved and can reliably demonstrate at the time of graduation. Each DLO has a number of Learning Outcome Indicators (LOI), which are examples illustrating, defining and clarifying the level of performance expected. The list of LOI is not comprehensive and there may be other indicators which can be used to assess achievement of learning outcomes.

DLO and their LOI employ only cognitive domain verbs selected from a table of cognitive verbs modeled after a Bloom’s cognitive domain table of verbs adapted specifically for engineering technology and applied science disciplines.

Graduate Capability

Students graduating from an accredited program have demonstrated achievement of all general learning outcomes, including a prescribed level of math, and discipline learning outcomes selected by the program.

Having completed a program that is based on applied mathematics and scientific and engineering theory, principles and practices and having acquired the knowledge, skills and attitudes to function in the work place, graduates are;

- able to evaluate assignments, establish objectives, set parameters and determine appropriate procedures and actions.
- able to exercise due diligence in the workplace and adhere to related practices, applicable laws and health and safety practices.
- able to work in accordance with labor-management principles and practices.
- able to work independently or interdependently as part of a discipline or multi-disciplinary team.
- prepared to assume responsibility for their work.

Graduate Career Opportunities

Graduates of Architectural, Building and Construction Technology - Technician programs have career opportunities in such areas as: business, industry, construction, government, and public organizations. They may find employment in careers such as: design/maintenance of equipment, processes, infrastructure, or systems; preparation of specifications, drawings, or instructions; quality operations; construction supervision, contract inspection and administration; operations and maintenance; field and customer service; estimating; technical sales; supervision of projects; training activities; and many other areas.

Discipline Learning Outcomes (DLO)

ARCTN01 Architectural Drawings

- Prepare complete sets of architectural drawings for residential and light commercial construction/renovation projects.

Learning Outcome Indicators include:

- 1.1 Recognize and clarify needs of project stakeholders.
- 1.2 Analyze and review construction documents including drawings and specifications.
- 1.3 Prepare and present information as graphics using standard drafting conventions.
- 1.4 Prepare, review, and document modifications to graphics to reflect as-built conditions.
- 1.5 Prepare and present project-related information in oral and written formats.
- 1.6 Produce hand-drawn sketches.

ARCTN02 Building Design and Detailing

- Apply basic architectural principles in building design and detailing.

Learning Outcome Indicators include:

- 2.1 Prepare layout drawings using industry standards.
- 2.2 Use scales, drawing elements, and graphic symbols.
- 2.3 Review and interpret construction drawings.
- 2.4 Design interior spaces applying principles of noise abatement, color, and lighting.
- 2.5 Apply barrier-free design principles.

ARCTN03 Project Management

- Plan, schedule and monitor projects applying principles of project management.

Learning Outcome Indicators include:

- 3.1 Monitor and report progress of construction projects.
- 3.2 Monitor project schedules.
- 3.3 Collaborate in the inspection of construction/renovation work.
- 3.4 Collaborate in resolving construction problems related to materials, scheduling, resources, and budgetary concerns.
- 3.5 Prepare deficiency lists.
- 3.6 Resolve deficiencies by taking appropriate action.

ARCTN04 Building Science

- Analyze and resolve technical problems related to construction projects applying principles of building science and construction engineering.

Learning Outcome Indicators include:

- 4.1 Construct layouts and projects applying knowledge of building science, layout, and construction.
- 4.2 Resolve, or arrange for resolution of, technical problems in project design, layout, and construction using a systematic approach.
- 4.3 Resolve building construction problems applying knowledge of building materials, methods, building envelope, and environmental controls.

ARCTN05 Construction/Renovation Projects

- Evaluate the use of equipment and materials in implementing and completing construction/renovation projects.

Learning Outcome Indicators include:

- 5.1 Apply knowledge of performance properties, potential, and limitations of equipment and materials.
- 5.2 Contribute to the selection of methods used to implement and complete construction projects in a safe, effective, and efficient manner.
- 5.3 Plan and organize testing and quality assurance of materials, methods, and equipment.

ARCTN06 Contract Documents

- Contribute to the preparation and production of bid/contract documents.

Learning Outcome Indicators include:

- 6.1 Access and/or source list of manufacturers.
- 6.2 Describe the various types of contracts, offers, and acceptances.
- 6.3 Describe the importance of coordinating specifications with drawings.
- 6.4 Prepare technical reports and other project documentation.

ARCTN07 Building Systems

- Explain the relationship between architectural, structural, mechanical, electrical, and environmental building systems disciplines.

Learning Outcome Indicators include:

- 7.1 Recognize the differences between architectural, structural, mechanical, electrical, and environmental disciplines as they relate to construction projects.
- 7.2 Resolve problems by obtaining assistance and clarification from appropriate specialists.

- 7.3 Contribute to coordination regarding clearances, locations, and interferences between disciplines.

ARCTN08 Liaison

- Plan and organize liaison among various project stakeholders.

Learning Outcome Indicators include:

- 8.1 Apply basic problem solving and decision-making.
- 8.2 Analyze and review construction information from appropriate sources.
- 8.3 Contribute to the selection, interpretation, and use of construction information for construction projects.

ARCTN09 Codes, Bylaws, and Regulations

- Apply knowledge of applicable building codes, zoning bylaws, and regulations.

Learning Outcome Indicators include:

- 9.1 Calculate building envelope size and municipal setbacks.
- 9.2 Identify inspection requirements and schedule site visits.
- 9.3 Organize notes and prepare inspection reports.

ARCTN10 Renovation & Restoration

- Contribute to the preparation of plans, cost estimates, and specifications for the renovation/restoration of buildings.

Learning Outcome Indicators include:

- 10.1 Implement field measurements of existing buildings.
- 10.2 Prepare as-measured drawings of existing buildings.
- 10.3 Collaborate in collection of field data.
- 10.4 Contribute to preparation of reports, cost estimates, and project documentation.
- 10.5 Prepare feasibility reports.

ARCTN11 CAD Systems

- Use CAD systems to develop architectural and construction projects.

Learning Outcome Indicators include:

- 11.1 Maintain currency with changes in technology that affect construction engineering.
- 11.2 Use electronic systems to store and retrieve information.
- 11.3 Select and access information from existing sources by using computerized techniques.
- 11.4 Access and share information using electronic communications effectively.
- 11.5 Resolve construction problems by applying knowledge of computers and application software.

- 11.6 Design and illustrate projects using the latest technology.
- 11.7 Translate data between architectural drawings and database applications.
- 11.8 Evaluate software used in architectural construction projects.
- 11.9 Manage electronic drawing files effectively.
- 11.10 Diagnose computer systems to minimize downtime.

ARCTN12 Sustainable Energy and Environmental Design

- Develop building construction projects by applying principles of sustainable energy and environmental design.

Learning Outcome Indicators include:

- 12.1 Identify municipal, provincial, and federal regulations that pertain to the environment.
- 12.2 Evaluate green design strategies.
- 12.3 Maintain awareness of environmentally friendly materials and systems.
- 12.4 Describe Leadership in Energy and Environment (LEED) program.
- 12.5 Recognize LEED certification for building design.

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