

GENERAL PROGRAM CRITERIA FOR ALL DISCIPLINES

Technician Level

Scope

The National Technology Benchmarks (NTB) represent the program criteria used by the Canadian Technology Accreditation Board (CTAB) in the review and evaluation of applied science and engineering technology programs.

Accreditation of TECHNICIAN level programs by CTAB means that graduates have International Recognition of Academic Qualifications under the *DUBLIN ACCORD (www.ieagrements.org).

The NTB establish a minimum level of achievement **at the time of graduation**.

National Technology Benchmarks Composition

The NTB comprise two sections:

- Part 1 - Program Criteria - **General** for all disciplines
- Part 2 - Program Criteria - **Discipline Specific**

Objectives

Educational

Technology programs will have educational objectives that are seen to be consistent with the CCTT profile for an applied science/engineering technician. These educational objectives must be re-evaluated periodically based on the needs of constituencies served by the program. An educational program will also have a series of documented program outcomes, which are consistent with this general section and the appropriate discipline specific section of the NTB.

National Accreditation

Programs in Applied Science and Engineering Technology will prepare graduates with the technical, managerial and personal skills necessary to enter careers in a specific discipline. The Program Outcome statements set out the culminating demonstration of learning that must be achieved by a graduate. Indicators of Performance* associated with each Program Outcome are to be considered "**such as**" statements, providing a measure of the type of achievement anticipated in meeting the outcomes. A program may have greater or fewer performance indicators than those shown.

In order for a program to achieve National Accreditation status, the institution must clearly show that the graduates have demonstrated the ability to satisfy all of the outcomes in this general section, and at least five of the Program Outcomes listed in Part 2.

General Requirements

An applied science/engineering technician level program must demonstrate that graduates have:

- a) working knowledge of math, science, and technology fundamentals to wide practical procedures and practices;
- b) the ability to identify, solve, and troubleshoot technical problems;
- c) the ability to assist with the design of systems, components, or processes;
- d) the ability to conduct investigations, search relevant codes and standards, and conduct tests and measurements;
- e) the ability to function effectively as in individual and as a member on technical teams;
- f) effective communication skills;
- g) the ability to understand the impact of technology solutions and the need for sustainable development.

Summary of Part I – General & Employability Skills

An applied science/engineering technician graduate must have demonstrated the ability to:

1. Communicate clearly, concisely, and correctly in writing and in person.
2. Apply a wide variety of mathematical techniques with the degree of accuracy required to solve problems and make decisions.
3. Interact with others in groups or teams that contribute to effective working relationships.
4. Demonstrate an awareness of the basic fundamentals of management and business principles.
5. Understand the fundamentals of ethics, sustainability, contract law, codes and standards.
6. Obtain and analyze data, and prepare reports, plans, specifications, sketches, graphics, drawings, or other technical documentation.
7. Use computer software, hardware and other technological tools appropriate and necessary to performance of tasks.
8. Apply knowledge of health and safety practices to minimize exposure to unsafe conditions and ensure a safe working environment for oneself and co-workers.

Program Outcomes

GC-01-T Communicate clearly, concisely and correctly in writing and in person.

Indicators of Performance, such as:

- 1.1. Plan and organize communications according to the purpose and the audiences.
- 1.2. Use proper language and style suitable to the assignment.
- 1.3. Demonstrate the practice of good technical writing.

GC-02-T Apply a wide variety of mathematical techniques with the degree of accuracy required to solve technical problems appropriate to the discipline.

Indicators of Performance, such as:

- 2.1 Assess mathematical strategies (including models, geometric representations or formulas, elementary algebraic equations, descriptive statistical methods, and mathematical reasoning) for suitability and effectiveness.
- 2.2 Execute mathematical operations necessary to implement selected strategies.
- 2.3 Estimate probable answers.
- 2.4 Use calculators or appropriate technical instruments to perform mathematical operations accurately.
- 2.5 Check for errors in numerical answers and the appropriate fit between problems and answers.
- 2.6 Express answers clearly.

GC-03-T Interact with others in groups or teams that contribute to the effective working relationships.

Indicators of Performance, such as:

- 3.1 Establish strategies to accomplish the identified tasks.
- 3.2 Identify roles for each member of the team.
- 3.3 Treat team members equitably and fairly.
- 3.4 Employ techniques intended to bring about the resolution of conflicts.
- 3.5 Regularly assess the group's progress and make adjustments when necessary.

GC-04-T Demonstrate an awareness of the basic fundamentals of management and business principles.

Indicators of Performance, such as:

- 4.1 Demonstrate an understanding of basic management principles.
- 4.2 Apply business principles as appropriate to the discipline.

GC-05-T Understand the basic fundamentals of ethics, sustainability, contract law, and codes.

Indicators of Performance, such as:

- 5.1 Understand the professional code of ethics of the Provincial Association or Society.
- 5.2 Apply ethical reasoning to resolve social, contractual and environmental issues, with respect to a project.
- 5.3 Understand environmental sustainability issues, with respect to a project.
- 5.4 Apply the principles of sustainability.
- 5.5 Demonstrate knowledge of codes and standards applicable to the discipline.
- 5.6 Apply knowledge of contract law as appropriate for the discipline.
- 5.7 Demonstrate knowledge of confidentiality and privacy regulations, as well as other pertinent regulatory frameworks and/or compliancy requirements that apply to the discipline.

GC-06-T Obtain and analyze data; prepare reports, plans, specifications, sketches, graphics, drawings, or other technical documentation.

Indicators of Performance, such as:

- 6.1 Determine the appropriate source and type of data required, and develop appropriate strategies for data collection.
- 6.2 Conduct and/or supervise the taking of measurements, their recording, and evaluation.
- 6.3 Analyze and interpret data using systematic approaches to problem solving and decision-making.
- 6.4 Prepare sketches and/or drawings in accordance with discipline standards, formats, symbols and reference systems.
- 6.5 Prepare schematic diagrams appropriate for the discipline.
- 6.6 Produce plans, drawings, details and presentation graphics using CAD software.
- 6.7 Produce field sketches and notes.

GC-07-T Use computer hardware and software necessary to the performance of tasks within the discipline.

Indicators of Performance, such as:

- 7.1 Determine when computers or other technology can enhance productivity, the completion of tasks, solving of problems, performing research or creating products.
- 7.2 Use basic computer operating systems and common application software competently.

- 7.3 Transfer data using electronic communication systems.
- 7.4 Manage computer file systems.
- 7.5 Solve technical problems using technical computer application software common to the discipline.
- 7.6 Use Internet technologies to transfer, research and retrieve information.

GC-08-T Apply knowledge of safe working practices, including relevant Occupational Health & Safety Regulations.

Indicators of Performance, such as:

- 8.1 Demonstrate knowledge of health and safety legislation.
- 8.2 Demonstrate knowledge of provincially regulated first aid program.
- 8.3 Demonstrate knowledge of legislation with respect to designated substances.
- 8.4 Demonstrate knowledge of legislation with respect to the transportation of dangerous goods.
- 8.5 Demonstrate knowledge of and apply health and safety legislation with respect to accident prevention.
- 8.6 Analyze a workplace area and initiate action to handle unsafe or hazardous situations.
- 8.7 Understand the importance of safety and environmental inspections.
- 8.8 Demonstrate the knowledge of safe working practices and the ability to work safely in a lab or shop environment.
- 8.9 Operate workplace equipment safely.

Appendix A

Conference Board of Canada Employability Skills (2007)

The skills you need to enter and progress in the world of work - whether you work on your own or as a part of a team. These skills can also be used beyond the workplace in a range of daily activities.

Academic Skills

Those Skills, which provide the basic foundation to get, keep and progress on a job and to achieve the best results. Canadian employers need a person who can:

Communicate:

- understand and speak the languages in which business is conducted
- listen to, understand and learn
- read, comprehend and use written materials, including graphs, charts and displays
- write effectively in the languages in which business is conducted

Think:

- think critically and act logically to evaluate situations, solve problems and make decisions
- understand and solve problems involving mathematics, and use the results
- use technology, instruments, tools and information systems effectively
- access and apply specialized knowledge from various fields (e.g. skilled trades, technology, physical sciences, arts and social sciences)

Learn:

- continue to learn for life

Personal Management Skills

The combination of skills, attitudes and behaviours required to get, keep and progress on a job and to achieve the best results. Canadian employers need a person who can demonstrate:

Positive attitudes and behaviours:

- self-esteem and confidence
- honesty, integrity and personal ethics
- a positive attitude toward learning, growth and personal health
- initiative, energy, and persistence to get the job done

Responsibility:

- the ability to set goals and priorities in work and personal life
- the ability to plan and manage time, money and other resources to achieve goals
- accountability for actions taken
- adaptability
- a positive attitude toward change
- the ability to identify and suggest new ideas to get the job done-----creativity

Teamwork Skills

Those skills needed to work with others on a job and to achieve the best results. Canadian employers need a person who can:

- work with others
 - understand and contribute to the organization's goals
 - understand and work within the culture of the group
 - plan and make decisions with others and support the outcomes
 - respect the thoughts and opinions of others in the group
 - exercise "give and take" to achieve group results
 - seek a team approach as appropriate
 - lead where appropriate, mobilizing the group for high performance
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